

**VIDEO CONFERENCING IN INITIAL TEACHER
TRAINING: DOES IT MAKE ANY DIFFERENCE IN THE
CONSTRUCTION OF TEACHER TRAINEES'
PEDAGOGICAL KNOWLEDGE?**

Thesis submitted for the degree of
Doctor of Philosophy
at the University of Leicester

by
Maria Hadjipavlou MA (Leicester)
School of Education
University of Leicester

May 2011

Video Conferencing in Initial Teacher Training: Does it make any difference in the construction of teacher trainees' pedagogical knowledge?

Maria Hadjipavlou

ABSTRACT

The aim of this research was to evaluate the integration of video conferencing technologies in a Postgraduate Certificate in Education (PGCE) Programme in the United Kingdom for the pedagogical development of trainee teachers. Two types of video conferencing were employed in this case study of a Primary PGCE course. Firstly, weekly multi-point video conferences over VOIP (Voice over Internet Protocol) took place between a group of trainees whilst on school-based teaching experiences. Secondly, many-to-many video conferences were employed to enable trainees to observe remotely a number of classroom lessons, following which they had the opportunity to interact 'live' with teacher and pupils.

The underpinning goal of this study was to understand the process by which trainees 'become teachers' within their university community of practice (CoP) moving towards the school CoP, with the identity issues involved, and to explore ways that technology potentially supports, sustains or expands this process.

Wenger's conception of a CoP, a group of people who share a concern about what they do and who interact regularly to share what they learn in order to learn more and learn how to do it better theorised the dynamics of the group of trainees, as revealed in this qualitative research. Interview evidence was taken from trainees, university PGCE tutors and experienced teachers.

It was found that video conferencing technologies genuinely enabled thinking about thinking, reflexivity, and a passion for teaching and communicating for a number of trainees within CoPs. Learning was itself the trajectory for trainees to 'become teachers'. The synchronous, immediate and communicative nature of video conferences enhanced this trajectory through the collective reflective work of all involved participants and bridged the two diverse but essentially overlapping CoPs, communities of pre-service and in-service teachers respectively.

ACKNOWLEDGEMENTS

First of all, I would like to recognise the invaluable help and contribution, stimulating suggestions and constructive feedback of my supervisor Dr. Chris Comber. Many of his inspiring ideas came to fruition throughout this thesis. I am deeply indebted to him for his guidance during the time of the research for and writing of this thesis.

Many people deserve my gratitude for helping conduct this research: the research participants – the whole PGCE cohort of 2008-2009 at a large University in UK for their participation and insights that went directly at the 'heart' of this thesis and the PGCE cohort of 2007-2008 who participated in the pilot phase. The University PGCE Tutors should be thanked for being open to new ideas and committed to effective training. The participating primary schools in the UK, the headteachers, experienced teachers and pupils deserve many thanks for opening up their classes to the world. I am grateful, also to the Teaching and Learning Consultant of Wigan's Local Education Authority, Gary Limb, for his dedication and belief in the value of such video conferencing exchanges. One of the 'gatekeepers' of this research, Tim Boundy, from JANET Collaborate service and the technical support team of the University were unstinting in their assistance.

My second supervisor Dr. Alison Taysum's advice helped me gain approval for proceeding with the data-collection of this research.

My 'critical friend' Dr. Barbara Jacobs was of great help with her most generous and thoughtful comments during the writing and editing process of this thesis.

Last but not least, I would like to thank my family, Averkios, Andriani and Alekos Hadjipavlos for their ongoing support over the years, my friends and a very special person in my life, Phoebus Marneros, for his encouragement.

Maria Hadjipavlou

May, 2011

Table of Contents

ABSTRACT	2
1 INTRODUCTION	11
1.1 Communities of Practice in Teacher Education in the spotlight	11
1.2 Outline of the research schemes	18
1.3 Rethinking Teacher Education	20
1.4 'The research problem'	22
1.5 Use of the technologies for supporting communities of practice in Teacher Education	28
1.6 Summary and structure of the thesis	31
2 LITERATURE REVIEW	33
2.1 Core Research Themes	33
2.1.1 Literature review search strategy	33
2.1.2 The role of the technologies to Teacher Education	37
2.1.3 Communities of Practice framework in Teacher Education	41
2.2 Setting the Scene: Two Overlapping Communities of Practice in Initial Teacher Training	45
2.2.1 Engaging within the Professional Learning Communities at Schools	47
2.2.2 Engaging within the University Learning Community	50
2.2.3 Theory and Practice in Teacher Education	54
2.2.4 Legitimate Peripheral Participation	59
2.2.5 Developing professional identity	64
2.2.5.1 Identity as a learning trajectory	67
2.2.5.2 Identity as a nexus of multimembership	68
2.3 New Technologies in Initial Teacher Training	72
2.3.1 Why Communities of Practice and New Technologies are prevalent in Teacher Education	82
2.3.2 Why Video Conferencing?	86
2.3.3 Where Video Conferencing may thrive in Teacher Education	92
2.3.4 Video Conferencing in Teacher Education	96
2.3.4.1 Video tutoring and distributed professional learning communities	97
2.3.4.2 Video conferencing for developing trainees' subject knowledge	101
2.3.4.3 Video conferencing for remote observations and nourishing learning communities among trainees, university tutors, teachers and pupils	104
2.3.5 Video conferencing 'critiques'	109
2.3.6 Professional context influencing the uptake of the technologies	112

2.3.7	Contextual factors influencing the uptake of the technologies	113
2.3.8	Human relationships influencing the uptake of the technologies	116
2.4	Conclusion	118
3	METHODOLOGY	121
3.1	Introduction to the research study	121
3.2	Research questions	124
3.3	Rationale for the research design	128
3.4	Stages in the research process	132
3.4.1	Identifying the case	132
3.4.1.1	Pilot phase	135
3.4.1.2	Engaging participants	138
3.4.1.3	'Sub-cases': (1) Multi-point video conferences during TE	140
3.4.1.4	'Sub-cases': (2) Remote classroom observations	142
3.4.2	'Getting the technologies right'	145
3.4.3	Identifying techniques of data collection and sources	147
3.4.4	Considering ethical issues	152
3.4.5	Limitations	153
3.4.6	Enhancing Trustworthiness of the Research Study	154
3.4.7	The process of analysing the research data	159
4	DATA ANALYSIS	166
4.1	Introduction	166
4.1.1	Research Scheme 1: Multi-point video conferencing cases during Teaching Experiences 1-3	168
4.1.2	Research Scheme 2: Three video conferencing cases for remote classroom observation	172
4.1.3	Identifying the focus of the study	176
4.2	Investigating the rationale of this study	177
4.2.1	A polarised position	178
4.3	The use of technological tools in the course	185
4.3.1	Technological practices already employed	186
4.4	Questions of learning, identity, and transition for trainees: the role of multi-point video-conferencing	189
4.4.1	Participating peripherally in the community of Teachers	193
4.4.2	Sustaining a university community	198
4.4.3	Experiencing a twin identity	205
4.4.4	Constant struggles Versus Successful Resolutions between the twin identities	214
4.5	The value of the multi-point video conferences on TEs: the views of participants, and analysis of their development over time	224
4.5.1	Discussion themes	225

4.5.2	Taking ownership of the video conferences	231
4.5.3	Social support	236
4.5.4	Personal support	240
4.5.5	Pedagogical support	243
4.6	Research Scheme 1: Multi-point video conferences - Summary of main findings	247
4.7	Research Scheme 2: Contextual and pedagogical factors for implementing remote classroom observation	249
4.8	The value of the video conference for remote classroom observation	254
4.8.1	Bridging the university general topics with actual schools	255
4.8.2	Social constructivism in action	258
4.8.3	Legitimate peripheral participation activities	260
4.8.4	Authenticity	262
4.8.5	Technological literacy	266
4.8.6	Positive effect for the university tutors	267
4.8.7	Positive outcomes for the pupils in schools	269
4.8.8	Positive outcomes for the teachers and primary schools	272
4.9	Models of use	274
4.9.1	Familiarisation	274
4.9.2	Substitution	276
4.9.3	Enhancement	277
4.9.4	Adaptation	279
4.10	Summary of findings: Implications of the video conferences	283
5	DISCUSSION	289
5.1	Overview	289
5.2	Question 1: Identity transformation throughout the course	290
5.3	Question 2: Sustaining peer communities via multi-point video conferencing whilst on TEs	298
5.4	Question 3: Remote classroom observations via video conferencing whilst at the university	313
5.5	Question 4: Video conferencing sits on the overlap of the two communities	323
6	CONCLUSIONS	327
6.1	Overview	327
6.1.1	Trustworthiness – Transferability	331
6.1.2	Ramifications – Challenges to the research study and lessons learnt	333
6.1.3	Areas for development and future research	339
6.2	In conclusion	342

APPENDICES	345
REFERENCES	365

List of Figures

FIGURE 1.1: TWO OVERLAPPING COMMUNITIES IN TEACHER EDUCATION	17
FIGURE 2.1: WENGER'S (1998) STAGES OF DEVELOPMENT OF A CoP, WHICH WERE ADAPTED BY FISHER ET AL. (2007) TO TRAINEES' PROFESSIONAL DEVELOPMENT	48
FIGURE 3.1: MULTI-POINT VIDEO CONFERENCING BETWEEN TRAINEES WHILST ON TES	122
FIGURE 3.2: VIDEO CONFERENCING LINKS BETWEEN A GROUP OF TRAINEES AND UNIVERSITY TUTORS LOCATED AT THE UNIVERSITY AND A 'LIVE' CLASS IN A PRIMARY SCHOOL IN UK	124
FIGURE 3.3: THE COURSE FORMAT OF THE SPECIFIC PRIMARY PGCE COURSE AND THE DISPERSED VIDEO CONFERENCING EVENTS THROUGHOUT THE COURSE WHILST AT THE UNIVERSITY OR ON TES	135
FIGURE 3.4: THIS VENN DIAGRAM PRESENTS SOME OF THE KEY CODES OF RESEARCH DATA DEMONSTRATING THE TWIN IDENTITY EXPERIENCED BY TRAINEES, AS STUDENTS AND AS TEACHERS	164
FIGURE 4.1: VIDEO CONFERENCING CASES IMPLEMENTED THROUGHOUT THE NINE MONTHS PRIMARY PGCE COURSE 2008/2009	168
FIGURE 4.2: SNAPSHOTS OF THE MULTI-POINT VIDEO CONFERENCE ON THREE TES: GROUPS OF TWO TO SIX TRAINEES JOINED ONLINE MEETING TO SUSTAIN PEER CoP WHILST ON TES	171
FIGURE 4.3: SNAPSHOTS FROM THE VC2 CONNECTING THE UNIVERSITY WITH A DISTANT PRIMARY SCHOOL: RECEPTION CLASS IN FOUNDATION STAGE WORKING 'ON THE CARPET' AND THEN IN GROUPS	175
FIGURE 4.4: SNAPSHOTS OF THE VC3 TAKEN AT THE UNIVERSITY SITE: TRAINEES OBSERVE A YEAR SIX CLASS WORKING IN GROUPS DURING THEIR SCIENCE LESSON	176
FIGURE 4.5: CONSTITUENT ELEMENTS OF THE TRAINEES' UNIVERSITY COMMUNITY	204
FIGURE 4.6: A PICTURE OF THE ANALYTIC FRAMEWORK DEVELOPED RELATING TO THE TWO ASPECTS OF THE TRAINEES' IDENTITY, AS STUDENTS AND TEACHERS, THROUGHOUT THE COURSE	210
FIGURE 4.7: IDENTITY AS A NEXUS OF MULTIMEMBERSHIP IN TWO COMMUNITIES THAT SOMETIMES ENHANCE ONE ANOTHER AND OTHER TIMES PRESENT A CHALLENGE	214
FIGURE 4.8: ALL THE DISCUSSION THEMES EMERGED WITH PEERS DURING MULTI-POINT VIDEO CONFERENCES WERE CATEGORISED AND PRESENTED IN THIS GRAPHICAL DISPLAY	231
FIGURE 4.9: MODELS OF VIDEO CONFERENCING USE IN THE PRIMARY PGCE COURSE [ADAPTED FROM COMBER AND LAWSON (2010: 319)]	282

List of Tables

TABLE 3.1: VIDEO CONFERENCING EVENTS ON TES	142
TABLE 3.2: VIDEO CONFERENCING EVENTS BETWEEN THE UNIVERSITY AND PRIMARY SCHOOLS IN UK	144
TABLE 3.3: TECHNIQUES OF DATA COLLECTION AND SOURCES FOR REMOTE CLASSROOM OBSERVATION (VIDEO CONFERENCES).....	149
TABLE 3.4: TECHNIQUES OF DATA COLLECTION AND SOURCES FOR THE VIDEO CONFERENCES ON TES	149
TABLE 3.5: LIST OF <i>A PRIORI</i> CODES.....	161

List of Appendices

APPENDIX A: CASE STUDY: INTEGRATING VIDEO CONFERENCING IN A PRIMARY PGCE COURSE	346
APPENDIX B: INDICATIVE QUESTIONS POSED DURING THE GROUP INTERVIEW WITH TRAINEES AFTER TE1	347
APPENDIX C: INDICATIVE QUESTIONS POSED DURING THE GROUP INTERVIEW WITH TRAINEES AFTER TE2	349
APPENDIX D: INDICATIVE QUESTIONS POSED DURING THE GROUP INTERVIEW WITH TRAINEES AFTER TE3	351
APPENDIX E: INDICATIVE QUESTIONS POSED DURING THE GROUP INTERVIEW WITH TRAINEES AFTER VC3	353
APPENDIX F: INDICATIVE QUESTIONS POSED DURING INTERVIEWS WITH A UNIVERSITY TUTOR AFTER VC3	354
APPENDIX G: INDICATIVE QUESTIONS POSED DURING THE INTERVIEW WITH THE EXPERIENCED TEACHER AND THE ICT CONSULTANT FROM LEA AFTER VC3	355
APPENDIX H: FORMAL LETTER FOR SEEKING PARENTS' CONSENT	356
APPENDIX I: SCREEN SHOTS OF THE NVIVO PROGRAM SHOWING THEORETICAL CATEGORISATION OF THE DATA INTO TREE AND CHILD NODES	357
APPENDIX J: VIDEO CONFERENCE FORM CONSTRUCTED TO BE SHARED BY ALL INVOLVED PARTICIPANTS INCLUDING ALL THE NECESSARY INFORMATION FOR ESTABLISHING THE FIRST 'LIVE' LINK	359
APPENDIX K: PLAIN OBSERVATION SHEET CONSTRUCTED FOR THE PURPOSES OF THE VIDEO CONFERENCES FOR REMOTE CLASSROOM OBSERVATION	360
APPENDIX L: A COMPLETED OBSERVATION SHEET BY A TRAINEE OBSERVING VC1	361
APPENDIX M: VIDEO CONFERENCE FORM CONSTRUCTED TO BE SHARED BY ALL INVOLVED PARTICIPANTS INCLUDING ALL THE NECESSARY INFORMATION FOR ESTABLISHING THE SECOND 'LIVE' LINK	362
APPENDIX N: OBSERVATION SHEET ASSIGNED FOR VC2 FOR REMOTE CLASSROOM OBSERVATION ...	364

1 INTRODUCTION

1.1 Communities of Practice in Teacher Education in the spotlight

Communities of practice (CoPs), according to the social learning theorist Etienne Wenger are 'groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly' (Wenger, 2006: 1). At the heart of this philosophy is the notion of learning through communication, of learning for its own sake, and of sharing a 'living curriculum' which is a dynamic, open, and socially-constructed learning system (Wenger, 2006: 4). This philosophy could apply to CoPs within all working environments, but is clearly evident in the most imaginative teacher training courses, where collaborative learning and the committed sharing of experience about how best to learn from and teach others can be encouraged and enhanced.

CoPs are not limited by physical boundaries, thus expanding the ways that people learn. Wenger's philosophy of shared and collaboratively communicated knowledge for its own sake and without boundaries could be said to underlie, to some extent, the development of Web 2.0 technologies. Web 2.0 technologies, is a new term used today to embrace any online platform that uses the World Wide Web as a venue for members' interaction, information sharing, active

participation and cooperation (Lemke, 2009: 4). They can offer a variety of opportunities for creating and sharing 'intellectual and social resources' (Lemke, 2009: 4). Consequently, CoPs can exist in physical places but also very successfully in online spaces because synchronous and asynchronous technologies have been found to be key means for supporting CoPs worldwide (Hernandes and Fresneda, 2003: Wenger and Snyder, 2000: McDermott, 2001). According to Wenger and Snyder (2000) CoPs represent the frontier of, and challenge to, the knowledge economy.

The CoP concept as a metaphor for reifying social interactions into a form, that is into words or theory, is employed in this thesis as a conceptual framework in an attempt to reify social dynamics, procedures, feelings and a nexus of different relationships researched in a teacher education context. Specifically, it focuses on a Postgraduate Certificate programme (PGCE) in Primary Education in a United Kingdom (UK) setting during 2008/2009. The main goal of the current qualitative research study is to explore the use of synchronous video conferencing technology as a medium for supporting, sustaining and potentially expanding these social dynamics in teacher education.

In modern society which is 'saturated with the visual image' (Lawson et al., 2010: 296), video conferencing is a technological tool which allows simultaneous audio and visual communication between the users and 'can be employed to meet different objectives' in the educational arena, both for

delivering traditional pedagogies and pursuing innovative practices (Lawson et al., 2004: 74). This study is concerned with exploring new learning environments through the use of video conferencing. Since the Department for Education (DfE) (2010b: 19) has recently announced that it expects all teachers to work, reflect and teach with other teachers cooperatively, this thesis asks what can video conferencing technologies offer to a more 'school-centred initial teaching training'?

Thus, three key areas represent the overall conceptual framework of this study: the concept of CoP, the educational discipline of teacher education, in particular initial teacher training, and the Web 2.0 technologies, especially video conferencing. In fact, video conferencing technologies have been in existence for two decades but also quite recently have come to the forefront because of the VoIP (Voice over Internet Protocol) tools. In fact, Crook and Harrison (2008: 10) consider the 'conversational arenas' using VoIP networks for one-to-one and many-to-many communication between internet users as one of the categories of Web 2.0 services. The VoIP along with web-cameras is the type of video conferencing used in this study by trainees to establish video and audio communication over the internet. It was chosen because the synchronous nature of the video conferencing sets it apart from many other Web 2.0 applications. Further, the other form of video conferencing employed in this study, for establishing many-to-many video conferences utilising more established (for example, H.323 call signalling) forms of video conferencing, although pre-dating Web 2.0 technologies, essentially facilitate the same kinds

of interactions. Moreover, the advent of IP connectivity (replacing ISDN/fixed line technology) brings this higher-end video conferencing into the same technological 'space' as VOIP. Hence, the potential of each of these three conceptual frameworks - CoP, initial teacher training and Web 2.0 technologies - for the purpose of breaking physical boundaries, promoting innovation in practice and fostering a collective re-construction of what is already known, is explored in this thesis.

To begin with, Etienne Wenger (1998b: 238) and Jean Lave coined the concept CoPs to place emphasis on 'intellectual, social and organizational configurations' which are 'spontaneous, and informal' in nature (Wenger and Snyder, 2000: 140). For this reason, they gathered a wealth of research material to identify ways to sustain and nurture these communities by gradually developing an understanding of their dynamics (McDermott, 2001). The term CoP was initially revealed in Lave and Wenger's ethnographic work accomplished in 1991 and related to the practices in workplaces. Specifically, CoP in the sense used in this study are groups of people, including experienced teachers, trainees and university tutors who interact on a regular basis, thus developing a dynamic knowledge resource through discussions and analysis of their everyday practice in seeking to pursue a shared enterprise (Wenger, 1998a).

For the purposes of this thesis the term *trainees* is used for pre-service teachers, student teachers or PGCE students, since the specific course uses this term to underline the status of trainees as training teachers rather than as students in the strictest academic sense. Also the term *experienced teachers* is used for practising teachers, in-service teachers or school teachers and *pupils* for students or children at schools since they are commonly-used terms. It is also worth mentioning that *CoP* could be both singular and plural but in this thesis *CoPs* will also be used to distinguish the plural from the singular usage.

Since, the focal point is on the context of teacher education it is vital to identify pertinent educational CoPs. Reviews of the literature (Barab et al., 2003: Barab et al., 2002: Sim, 2006: Baek and Barab, 2005) reveal that a key educational CoP is formed in the context of professional development by trainees who enrol in teacher education programmes with a view to joining communities of experienced teachers. Fisher (2007) proposes considering two CoPs: the CoP formed by experienced teachers in the workplace, in schools identified as communities of teachers, and a transitory one formed by trainees identified as communities of trainees. However, the two CoPs, of trainees and of experienced teachers, he claims, do not function independently of each another (Fisher et al., 2007). Essentially, communities of teachers are said to open up their practices to newcomers to allow a renewal of their professional skills, while trainees gradually immerse themselves in the professional communities of teachers, a process that involves fostering a sense of belonging, and identity construction (Barab et al., 2003: Barab et al., 2002: Sim, 2006: Fisher et al.,

2007). In fact, in the movement from trainees to professional teacher status, trainees 'adopt difference stances', language, practices and therefore 'they position themselves differently [as well as they] are positioned differently by others, and so they change identity' (Kelly et al., 2007: 154).

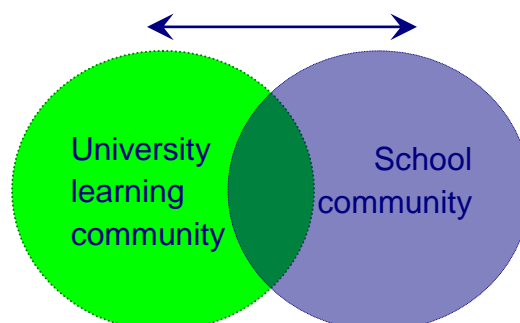
As Barab et al (2002: 238) point out, trainees not only negotiate membership in the professional community of teachers but in addition 'they negotiate membership in a community of students who are studying to be teachers', a community of trainees. Fisher (2007) adds that informal relations between members who engage in the pursuit of a common enterprise develop both an individual and a social identity and a capability over time. The capability expected to be produced in a PGCE programme in education is both 'to teach and engage people as learners' (Fisher et al., 2007: 194).

As Barab (2002: 489) explains, for a trainee 'the entire process of learning as a member of CoT [Community of Teachers] occurs fluidly through the reflexive relations among a school participation and university seminar participation', in other words within the school and university communities. In this study the term *Teaching Experience(s)* (TE or TEs) is used for school participation, rather than *practicums* or teaching placements, reflecting the term used in the specific PGCE course which is the subject of the present study. The process by which trainees in the PGCE programme evolve their teaching identities within the overlapping structure of the two CoPs, the university community and the

professional teaching community, is a central issue. In fact, the pedagogical and professional development of a number of trainees as teachers within two communities, with all the identity issues involved, represents a key theme of the current study.

To date, online learning community environments have been developed to facilitate teacher professional development but very little attention has been given to the ongoing interaction and overlap of the two 'loops' where the process of becoming teachers takes place. As a result, at the centre of this investigation lies the potential use of video conferencing to enhance the overlapping element of the trainees' experience (graphically presented as the dark green area linking the two communities in Figure 1.1) as they move back and forth into the two communities with the prospect of becoming full members of the school community. In fact, two interlinked research schemes were designed to draw and sustain real time, authentic links between the two CoPs.

Figure 1.1: Two overlapping communities in teacher education



1.2 Outline of the research schemes

During 2008-2009, one hundred and nineteen trainees in a Primary PGCE course in a large university in a UK Midlands city, were provided with opportunities to exploit video conferencing technologies, either voluntarily and/or as a part of their course, during their time on TEs (research scheme 1) and at the university (research scheme 2) to assist them in achieving their learning trajectories to becoming teachers. Becoming a teacher is realised as a *learning trajectory*, a term introduced by Lave and Wenger (1991), since it is a process of gradual engagement in practice which involves progressive changing of identity. Hence, trainees could define where they have been in their learning, where they are and where they need to reach.

The first research scheme, video conferences during TEs, was piloted during the 2007-2008 Primary PGCE course and integrated throughout the 2008-2009 Primary PGCE course. Groups of volunteer trainees were provided with weekly scheduled afternoon slots for online video conferences with colleagues, from which they could choose. They enrolled via email, received an invitation and simply followed the link to enter a professional video conferencing platform. They were provided (by the researcher) with free web cameras to allow them to see and hear each other from the comfort of their homes to chat and engage in discussions related to their daily school experiences as well in as social and personal issues which they wanted to share within their peer community.

The second research scheme, video conferences for remote classroom observations, was initially piloted during the 2007-2008 Primary PGCE course and actually launched in the 2008-2009 Primary PGCE course. The university implemented three video conferences for remote classroom observations throughout the academic year with two different primary schools in the UK, one located close to and the other distant from the university site. These video conferences supported a new learning environment involving a large number of trainees (n=119) and their university tutors, in collaboration with experienced teachers and pupils at remote schools, as well as a local educational authority (LEA) in the UK. These all communicated virtually to explore the possibilities of video conferencing for the involved participants, especially for trainees' pedagogical knowledge. The university community observed a live lesson at a distance and at the end of the lesson interacted with the school community to interrogate pupils and the teacher about the lesson and share thoughts and feelings. Following this, a debriefing session on the observed lesson took place at the university among trainees and university tutors.

Both video conference schemes, one on TEs and one for remote classroom observation, were integrated as and when possible to facilitate the professional development of the trainees on the specific primary PGCE course, as seen through the lens of CoP approaches in teacher education. Hence, this research set out to answer whether video conferencing can assist, by any means, the trainees' pedagogical development, firstly by supporting, sustaining and potentially expanding peer communities whilst on TEs and secondly, by

enabling live links between the university and actual classrooms. To achieve this, the present study initially asks how trainees become teachers and how transform their identities in the process of becoming teachers. The study further investigates what video conferencing can offer at the heart of these processes, in particular for supporting the overlapping element of the course; that is, trainees' participation in two overlapping communities, the professional teaching community and their university community. The rationale behind this research study is now explored in this introductory section.

1.3 Rethinking Teacher Education

During the two past centuries, there has been a significant shift from the notion of teacher education as a process of 'traditional analysis of the cognitive attributes and instructional practices of individual teachers' to a pedagogical environment which future teachers are eligible to explore, experiment with alternative teaching methods, approaches and strategies within a peer supported collaborative CoP (Barab et al., 2002: 493) and through action research (Malone, 2008). Sim (2006) asserts that trainees need to be able to fit and align their emerging practices into the already established practices however, with the prospect of becoming reflective. Consistent with Cochran-Smith and Lytle's arguments (1999: 18) that trainees are required to develop an 'inquiry stance' towards education, Barab et al. (2002: 493) add that trainees

are expected to 'see questioning and learning to teach as a part of a lifelong task'.

In fact, in Finnish teacher education, which is strongly research-based, Jyrhämä (2003: 2) argues that an advanced goal for the trainees is to gradually undertake responsibility for their own professional development as they move towards autonomy. Other researchers including Sim (2006: 82) underline that trainees should be 'confident and able not only to seek out and apply research relevant to their practice, but also to contribute to the field'. This suggests that trainees seek to become reflective and knowledgeable teachers eager to pursue innovative practices. In this way, teacher education will gain a 'central role in the fate of virtually every educational reform agenda' (Cochran-Smith and Lytle, 1998: 32) providing feedback on what works, and contributing new ideas.

CoP approaches correspond with this new trend of collaborative, social re-construction of knowing, and exploration of practice in teacher education. Consequently, the nature of becoming a teacher has shifted and is still shifting. Thus, the CoP concept provides a framework for understanding and conceptualising this change (Fisher et al., 2007; Kelly et al., 2007). However, exploring which stage teacher education and the teaching profession has reached in realising some of these changes, is the concern of the next section.

1.4 ‘The research problem’

Hawkes and Romiszowski (2001: 285) assert that teachers typically work in isolation, although National guidelines in the United States (US) cite the importance of peer-supported environments for inquiring teaching and learning processes. It has also been documented (Evans and Powell, 2007: Cochran-Smith and Lytle, 1992) that in the teaching profession there is a notion of privatisation of the work. In effect, the time teachers spend talking with colleagues out of their classrooms is often not perceived as working hours, and it is clear that teachers can afford little time to engage in discussions, draw information from research and share ideas with each other due to the busy daily rhythms of a school environment (Cochran-Smith and Lytle, 1992: Kelly et al., 2007).

Moore and Barab (2002: 44) echoing Baek and Barab (2005) say that ‘school schedules rarely allow teachers the opportunity to see their colleagues in action’. Their research reveals another reason why teachers rarely offer their sincere constructive criticism to their colleagues’ practices or share their reflections on their own practices beyond the fact that they have a busy schedule. Citing a teacher from the Inquiry Learning Forum, a professional development website designed for mathematics and science teachers, Baek and Barab (2005: 173) propose that teachers’ ‘culture is not one of “let me come in and sit in your classroom and critique you and help you to grow”’. From

this point of view this is because teachers are scrutinised by media and the government in relation to their pupils' performance and thus they prefer not to be critical of one another especially in a public forum where the comments may be permanently archived (Baek and Barab, 2005). Hence, thought-provoking questions, feedback and reflections never occurred in the Inquiry Learning Forum in Baek and Barab's research (2005) although teachers had the opportunity even to observe video segments of classrooms that provided insights into the teachers' craft, and skills. According to Kennedy (2002) craft knowledge is a source of knowledge based on experience of being a parent, a teacher, a student, from newspapers, friends and colleagues, from spontaneous ideas or empathy. It tends to be idiosyncratic and 'a-theoretical' which means it mainly derives from teachers' self-critique on their practices that may have led to dissatisfaction (Kennedy, 2002: 356).

Moreover, in the same research, Baek and Barab (2005) reported that teachers needed ready-to-use resources including lesson plans to fulfil their immediate daily needs and in fact that these needed to be easily accessible due to teachers' daily time constraints. Similar conclusions are reached in Moore and Chae's study (2007) which investigated via phone interviews how newly qualified teachers use online resources. It was revealed that beginning teachers use online resources predominately for accomplishing daily professional tasks including finding ideas for lesson planning or behaviour management techniques, rather than receiving emotional and personal support or making an effort to improve teaching practices through critical reflection with colleagues

(Moore and Chae, 2007). It was thought paradoxical, though, that a number of beginning teachers reported being stressed, feeling inadequate, lonely or on the other hand eager to share new ideas for teaching; however, they barely used technologies 'to chat or anything' as they indicatively stated (Moore and Chae, 2007: 220). Along similar lines, Tracey et al's (2008) longitudinal study in the English context that was concerned with exploring beginner teachers' experiences of initial teacher training, Induction and early professional development revealed that only 311 out of 1,451 surveyed teachers (21%) engaged in sharing good practice with an online peer community.

Accumulating further research data in this thesis from the existing literature on trainees' and teachers' early experiences in the workplace, one could recognise the emerging calls for developing collaborative learning approaches in teachers' professional development. Statistical results in the U.S in 2002 show that 29% of beginning teachers moved out 'of the teaching ranks' after three years of recruitment and almost 40% after five years of recruitment (Moore and Chae, 2007: 215). Some of the reasons given for leaving the profession have been associated with the complex nature of the teaching in which teachers are required to cope in unique situations alone; hence, Moore and Chae (2007: 222) suggest 'online communities to connect with other teachers as a means of meeting their various needs'. Similarly, Herrington et al. (2006) commented on the attrition rates published in 2003 by the Department of Education Science and Training in Australia that 25% of teachers leave the profession during the initial five years of recruitment. Herrington et al. (2006) identify faults in allowing

the supportive trainees' university communities to reduce once they enter the profession as beginning teachers.

The UK's teaching retention status deviates little from other countries' statistical results with a relatively low retention of beginning teachers within five years of recruitment (Tracey et al., 2008). The House of Commons Education and Skills Committee (2004) reports that about three-quarters of recruitment levels are still in the profession ten years later. The Committee called for building collaborative professional learning communities among colleagues, even across schools, observing and providing feedback to one another, sharing the craft knowledge of teaching, reflecting and promoting practitioner enquiry and research. In addition, DfE (2010b: 19) reports that 'teachers learn best from other professionals and that an 'open classroom' culture is vital: observing teaching and being observed'.

It is argued that teachers who barely regard communities as resources at times of need (Moore and Chae, 2007) and who hardly ever develop collaborative research attitudes towards their practices (Cochran-Smith and Lytle, 1992) may originate this occupational stance from the very beginning of their training (Evans and Powell, 2007). Significantly, if trainees enrol in competitive courses or if they are posted at remote locations whilst on TEs, they may acquire limited opportunities for peer reflection (Sim, 2006: Evans and Powell, 2007). Explicitly, there is research evidence to suggest that trainees 'on teaching practice and

their supervisors are for the most part 'locked' into their respective locations...' which means that 'time and distance act as severe limitations to discourse' (Sharpe et al., 2003: 531). Further, trainees are in a sense geographically separated from the CoP of experienced teachers in which they seek to engage (Moore and Barab, 2002). Moore and Barab (2002: 45) add that 'while many pre-service programs do their best to give their students multiple field experiences, the bulk of their university experience is far removed from actual classrooms and their professional community'.

This thesis reflects Evans and Powell's (2007) position, that is, what better starting point than in initial teacher training to begin the processes of enculturation in the ethics and conduct of a supportive collaborative CoP? Thus, enhancing distributed CoPs to eliminate physical boundaries and engage them in constant sharing of learning would seem valuable during their studies and their future professional career (Sim, 2006). There is evidence though that even in cases where trainees have been encouraged to use online collaborative communities' approaches during their training they still may not find their way towards using online communities as a means of support during their practice as professional teachers (Moore and Chae, 2007). Moore and Chae (2007) explain that the majority of today's in-service teachers belong to the generation of people who 'grew up' using the internet as a vast repertoire of information whereas the following generations also use the internet as a social networking tool in a daily basis. Hence, they assert that 'incoming teachers in the next few years will have no barriers' for social networking and they will be more open in

engaging in online communities 'to meet their unique needs as beginning teachers' (Moore and Chae, 2007: 223).

Overall, what has been argued in this section is that participation in the reflective process that occurs within peer CoP early in trainees' career may be a key strategy for sustaining various CoPs throughout teachers' professional life (Sim, 2006). This may result in the eventual transformation of the social activity in schools. Consistent with the findings of the Herrington et al (2006) paper, the Moore and Barab (2002) study and Hramiak action research (2010), the present research suggests sustaining and building upon existing or an already established university CoP of trainees in order to alleviate professional isolation instead of designing an online CoP from the outset is beneficial. Further, it suggests examining connections between school and university-based experiences in teacher education, as there is a wealth of research evidence advocating that reflective and inquiry-based pedagogical practices could be realised in this way (Squire and Johnson, 2000: Hu et al., 2002: Sharpe et al., 2003: Wheeler et al., 2005). Walkington (2008: 9) adds that close cooperation, joint evaluations, research and discourse 'through networks of ideas and strategies' across professional disciplines that involve workplace learning including between universities, teacher education providers and schools, can have mutual beneficial influences.

1.5 Use of the technologies for supporting communities of practice in Teacher Education

Technological functions and attributes, including time and space independence; instant connection with multiple sites; storage capacities to save and retrieve discussions and video segments; data transfer; and the increasing speed in transmitting messages, are shown to allow reflective thinking, discourse, and interaction (Evans and Powell, 2007: Hawkes and Romiszowski, 2001). In this way, co-present communities, which are the communities formed by members who are in close physical proximity, can be said to be sustained in online environments (Barab et al., 2003). Lueg (2000: 3) explains that even though a CoP may be enacted in the virtual world, the process of 'learning and doing is still situated in the real world' which means that 'the overall situation is real, not virtual'.

Exploring virtual CoPs (VCoPs) for teacher professional development has been a focal point for researchers worldwide, particularly in Australia, the U.S, the UK and Singapore (Fisher et al., 2007: Henderson, 2006: Barab et al., 2003: Sharpe et al., 2003). It is noteworthy that this study is concerned with the use of technology to enhance non-virtual existing CoPs rather than build virtual communities from the outset. A number of research studies have suggested that supporting online the already existing learning networks amongst communities of trainees, university tutors and experienced teachers assist

trainees in sharing and examining cooperatively their newly constructed experiences in receiving support and acquiring real-world learning experiences, from a distance (Lehman and Richardson, 2007: Millwater, 2005: Fisher et al., 2007: Wilkerson and Rogers, 2003: Pratt, 2008: Haldane, 2005). Baek and Barab (2005: 161) argue that technologies can effectively 'provide avenues for teachers to deal with real problems collaboratively with a diverse group of other teachers who might otherwise be difficult to meet' in times of need. Baek and Barab (2005: 161) explain that technologies can allow a secure environment for teachers to construct their professional identity and culture cooperatively, reflect on educational issues, and in the longer term 'encourage educational reform'. This can assist in working towards a common purpose and developing a feeling of identity (Lueg, 2000: Kirschner and Lai, 2007: Pratt, 2008).

As a result, online professional CoP is one of the most commonly used terms in recent teacher education literature (Kirschner and Lai, 2007), promoting an innovative model of professional development primarily based on collaborative reflection on action (Schön, 1987: Sharpe et al., 2003). Hawkes and Romiszowski (2001: 288) agree that for teachers' professional development, community-based approaches enhance critical reflection on practice assisting teachers to 'make and sustain improved instructional practices'. Similarly, Kirschner and Lai (2007) and Banks et al. (2004) claim that one of the defining learning processes that occurs within collaborative CoP in teacher education is reflective practice. Therefore, this study employs the notion of reflective practice

from Schön's work to understand teachers' reflection on their practices prior to or after a lesson via the means of video conferencing.

Since video conferencing technologies are the subject of this study it is worth mentioning some relevant research in the UK context. Since 1999, a multi-site network called Teaching and Learning Observatory (TLO) has been established in initial teacher training at the University of Nottingham, bringing together pupils, teachers, trainees, university tutors and researchers via video conferencing, thereby nourishing learning communities (Coyle et al., 2006). In fact, as far back as 1996 the University of Hull explored the capacity of video conferencing technologies to cover organisational constraints with partner schools that led to trainees' dispersal and isolation, and to change the traditional mindset in the use of the technology towards innovative real time collaborative work (Wright and Cordeaux, 1996). At Manchester Metropolitan University, also, real time observation via video conferences offered a new method of analysing the art of teaching for trainees (Haldane, 2005). At the University of Sussex, an In-School Teacher Education Project (In-STEP) aiming to provide opportunities to the Secondary Education, Science trainees on a PGCE course observing via interactive video system normal classroom practice, found out, through group interviews with trainees, that such events enabled seeing 'theory in action' (Marsh et al., 2010: 743). Further, it affected the university tutors' role, shifting them from being lecturers to becoming expert commentators, assisting trainees to develop into reflective pedagogical thinkers by engaging them in reflective activities, 'for example, why is that teacher using

that teaching method - let's explore what they could have done instead...' (Marsh et al., 2010: 745). Further, the University of Plymouth initiated multi-point e-conferences between English teacher education students when on TE, to re-conceptualise the nature of supervision and to allow trainees to negotiate their own discursive safe spaces (Pratt, 2008).

Ultimately, technologies within the framework of CoP may provide the structure to realise learning environments enabling knowledge acquisition in respect of the practices of teaching (Sharpe et al., 2003: Evans and Powell, 2007: Pratt, 2008).

1.6 Summary and structure of the thesis

Video conferencing technologies as a tool used for trainees to learn with and from others, learn how to learn, learn from people they think they cannot learn from, learn through reflection and become alert to the ways they are educated through meta-cognitive processes, with the support of anyone who may have something to tell them, is explored. Video conferencing had been chosen because it facilitates synchronous communication and immediate interaction which is a necessary condition for a CoP to work as a dynamic learning process which has no boundaries.

The following literature review, Chapter 2, seeks to examine evidence through the existing literature of the socially dynamic process of gradually become members of an active teaching CoP, focusing on the interrelation between identity and practice, between theory and practice and by the processes of legitimate peripheral participation. This is a condition for newcomers like trainees, which provides possibilities for learning within the social structure of practice and nexus of relationships developed in schools, without being too risky or threatening. This means that trainees are progressively undertaking responsibilities in practice (Lave and Wenger, 1991).

The literature review also focuses on the existing empirical evidence on online CoP in teacher education. It further examines the empirical evidence on the use of video conferencing as an integrated tool in teacher training, aiming to shed light on where it may work, and where it may fail. In the chapter following this, Chapter 3, an examination of the methodological approaches employed for the implementation and analysis of this research as well as the ethical issues and procedures followed is explored and described. Next, a detailed statement of the findings of this case study is presented in Chapter 4. Following this will be a critical discussion of the findings in Chapter 5. Finally, the concluding chapter, Chapter 6, offers a summary of the conclusions revealed from this study and suggestions for further research.

2 Literature Review

2.1 Core Research Themes

The purpose of the literature review is dual: it aims to examine the conceptual framework of the CoP approach based on the existing literature to provide a deeper understanding of the social fabrics and complex procedures involved in developing a teaching identity, and further it aims to examine the opportunities offered for supporting CoPs in teacher education by using new means of communication mediated by technologies. Thus, this chapter is organised in two parts; the first explores the processes of learning the craft of teaching within CoPs, while the second considers the potential of the technologies as a basis for enhancing these processes of learning. The current state of knowledge and theory in relation to core research themes - CoP, initial teacher training and technologies, some of which are Web 2.0 technologies - is discussed. First, however, the search strategy of the literature review is explained.

2.1.1 Literature review search strategy

Little has been written to date on the use of video conferencing technologies in initial teacher training in comparison to literature on ICT (Information Communication Technologies) more generally. Hence, for the purposes of this

literature review, a strategy of broadening the search coverage of the literature was adopted (Boote and Beile, 2005). This means that the literature review draws together analogous research on the use of video conferencing in the broader field of teacher education (corresponding to both trainees and experienced teachers) and workplace learning, as well as on the wider interest area of technology implementation in initial teacher education. The gathered existing literature on technologically-based teacher education embraces both the fields of initial teacher training and continuous professional development (CPD), because it is valuable to see consistency between the two fields of pre- and in-service training. Where a research study is only relevant to the one field or the other, this is indicated, otherwise the research findings or arguments are applied to teacher education in general.

A number of search engines and electronic databases including Scopus, British and Australian Education Index, Eric (Educational Resources Information Center) and Google Scholar were used for conducting the following literature review. A variety of search terms was identified to ensure covering all possibilities of similar terms used in the literature (Creswell, 2005). Explicitly, for identifying research on video conferencing some of the terms used were: 'e-conferencing', 'teleconferencing', 'telepresence', and 'interactive whiteboard combined with broadband telecommunications', 'interactive television', 'virtual classroom visits' and 'virtual workplace'. As a result, a number of journal articles, research reports, conference papers, books, theses, multimedia (Dvds) and web pages relevant to the conceptual framework and/or design of this

research were used to contribute important findings, ideas, arguments, decisions, concepts or methods in this thesis (Maxwell, 2006).

Endnote bibliographic management tool was employed to store and manage bibliographic details of all resources, keep notes when reading, summarising and deconstructing a paper, a chapter or a book, and to assign keywords for retrieving references (Beekhuyzen, 2008). Further, highlighting and making notes in the margin of print-out papers were regarded as practical steps in managing relevant text (codes). These codes or descriptive details included useful quotes, definitions, ideas for interviews, tips for implementing technically and pedagogically successful video conferences, justifications for the current study, limitations of the studies, use of theory, the history of employing new technologies in education, the status of initial teacher training and empirical evidence and methods.

A categorisation system was created for classifying consistently the electronic papers in folders and subfolders. Connections and a set of relationships between the various concepts of the research's conceptual framework were explored. Explicitly, it was revealed that the collected literature varies in purpose and direction as there is research evidence either focused exclusively on the potential of new technologies in teacher education (Martin, 2005: Kent, 2007: Plonczak, 2010: Lehman and Richardson, 2007: Waters-Adams et al., 2009) or involving studies entirely concerned with the implications of CoP

theory in teacher education (Walkington and Vanderheide, 2008: Sim, 2006: Sutherland et al., 2005: Gómez and Rico, 2007). This has been criticised by Kirschner and Lai's (2007) paper on the grounds that it is strange that in the 21st century there is still research on teacher education that pays little attention on research in ICT and vice versa.

In recent years, all three interwoven core conceptual frameworks: CoP, Web 2.0 technologies and initial teacher training have been investigated in a number of research studies (Kelly et al., 2007: Fisher et al., 2007: Kynäslähti et al., 2006). In particular, there is specific literature on the exploration of video conferencing technologies within online communities in teacher education which is the focus of this thesis (Hu and Wong, 2006: Sharpe et al., 2003: Wheeler et al., 2005: Haldane, 2005: Marsh et al., 2010: Pratt, 2008: Wilkerson and Rogers, 2003). Other relevant domains included in this literature review concern newly qualified teachers (Herrington et al., 2006: Moore and Chae, 2007) or continuing professional development (CPD) for teachers (Henderson, 2006: Kamakari and Drigas, 2010). The rationale of this literature review is to go beyond explicating the technical attributes of video conferencing technology or merely replicating traditional practices in teacher education via the technologies.

2.1.2 The role of the technologies to Teacher Education

In recent years, teacher education institutions are required not only to educate the 'Net-generation teachers' (Kirschner and Lai, 2007) but further they have to prepare them to teach in ways in which they were not taught, 'learn in collegial teams, treat parents/children as partners in learning, develop and draw on collective intelligence, build a capacity for change and risk' (Hargreaves, 2003). In the U.S, policy makers have embarked on redesigning teachers' professional development in order to realise the expected transformation in schools towards 21st century technologies and to research how people learn to bring 'a spirit of innovation and entrepreneurship' in response to the economic crisis (Lemke, 2009: 4). 'Web 2.0 tools, in combination with systems thinking and collaborative, innovative leadership, have the potential to enable teachers to tap into multiple professional learning communities (PLCs), thus enabling them to embed meaningful professional development into every day of their professional lives' (Lemke, 2009: 4). Since the underlying principles and quality of initial teacher training are important in prospective teachers' professional lives (Department for children schools and families, 2007: Kynäslähti et al., 2006), teacher education seems to carry out an important role within the educational cycle (Wright and Cordeaux, 1996). In effect, teachers who actively engage in sharing, researching, and interpreting their own work within their local communities and the larger community of teachers, researchers and policy makers, have been said to positively value and promote any

opportunities for their pupils to become engaged in similar ways within their own local or global communities (Cochran-Smith and Lytle, 1992).

Young people will also need to be taught in ways that are close to how they learn in their everyday life. According to Lemke (2009) it seems paradoxical that Web 2.0 tools are now banned from schools although are the most popular environments among pupils. Such tools are:

- *Wikis* which are simple websites that allow collective editing by groups, friends and families;
- *Tweets* which are text-based messages on the Internet displayed on a user's profile page;
- *Social networking services* which are platforms focused on building relations among people with common interests or activities;
- *Chat rooms* which allow interactive real time messaging for communities of users;
- *RSS (Really Simple Syndication) feeds* which allow publishing and receiving frequently updated information such as news headlines, audio, and video from favourite websites without manually inspecting websites;
- *Online gaming*;
- *Weblogs* (blogs) are interactive websites or parts of websites where people leave their comments and messages called entries;

- *Video conferencing through VOIP (Voice over Internet Protocol)* which allow real time interaction with peers and experts over the internet.

Owston (2009) underlines the fact that it will be insufficient to merely bring digital tools to the classroom without considering the ways they could be employed in teaching and learning and the implications that they may bring. Therefore, trainees will be better-equipped teachers if they are trained in how to employ new Web 2.0 technologies in their future career.

Comber (2011) draws a distinction between ICT for CPD which is the use of new technologies to enhance professional development opportunities for teachers, and CPD for ICT which is professional preparation for employing new technologies in the teaching and learning processes for pupils. In fact, the Training and Development Agency for schools (TDA) in the UK expects all teachers, experienced teachers and trainees, to develop their skills both in using ICT to support their teaching and wider professional activities and in designing opportunities for learners to develop their ICT skills as well (Training and Development Agency for Schools (TDA), 2007: Lehman and Richardson, 2004). In other words, they are expected to engage in both ICT for CPD and CPD for ICT (Comber, 2011).

Hence, as already argued, trainees should first explore the pedagogical uses of the technologies within their disciplinary contexts and develop positive attitudes towards transformative technologies whilst still in training (Lawson and Comber,

1999: Lehman and Richardson, 2004: Fisher, 2004: Gao, 2010). Trainees' engagement with using the technologies during their initial teacher training is a predictor of their use during their teaching career (Christensen et al., 2002). Explicitly, Lehman and Richardson's (2007) study surveyed and interviewing trainees shows that their engagement with video conference technology led them to develop technological skills with a view to using the technology critically in their own future classrooms.

Similarly Herrington's case (2006) on Beginning and Established Successful Teachers' (BEST) Website designed by the University of Wollongong in Australia showed that initial teacher training could play a key role for developing trainees' reflective and collaborative routines useful for their future career. The Website aimed at supporting CoP for primary and early childhood teachers which were built on existing peer communities intuitively emerging at the university level in teacher education (Herrington et al., 2006). Hence trainees could keep in touch with their colleagues at the university long after the completion of their course and foremost within a wider community of teachers (Herrington and Kervin, 2007). The site provides a friendly environment for sharing problems related to their new job, for dealing with immediate concerns, providing online mentoring by expert teachers, up-to-date resources, newsletters, and interaction on chat spaces and weblogs (Herrington and Kervin, 2007: Herrington et al., 2006). Similarly, Gao (2010) argues that it is important that provision is taken in initial teacher training to support a collaborative network of trainees who maintain communication and share

experiences even after the course completion and in fact, from the outset of their professional life.

Overall the technologies and the concept CoP are increasingly considered 'dual assets for pedagogy' in teacher education (Evans and Powell, 2007: 200) for supporting trainees' social interaction, engagement in authentic tasks and knowledge construction (Kirschner and Lai, 2007). In this way, as Lemke (2009) argues, combining effectively Web 2.0 tools with the collaborative professional learning communities may align teacher education paradigms to the today's 'participatory society' in which people of all ages are socialising, collaborating, sharing, negotiating, debating, learning through open, public and social networking.

2.1.3 Communities of Practice framework in Teacher Education

The theoretical framework of this research, CoP has emerged from the literature because according to a number of researchers (Walkington and Vanderheide, 2008: Sim, 2006: Sutherland et al., 2005: Gómez and Rico, 2007) it provides a legitimate framework to understanding some of the changes in teacher education towards a socio-cultural conception of learning. Explicitly, the CoP concept is a constituent element of a social theory of learning which appraises 'knowledge' as a competency in pursuing enterprises; in the sense used in this study, 'knowledge' is regarded as the competencies acquired in the

process of becoming a teacher. It also sees 'knowers' as social beings, who develop knowing through participation and engagement in practice with other people, for bringing meaning to the world and to what they are doing (Wenger, 1998b). This is directly related to the teacher education context because teaching is primarily a social activity: it is about engaging in interrogating, interpreting anew and solving immediate situations which are unique and uncertain within multi-various social, political, historical, and cultural contexts involving particular pupils (Cochran-Smith and Lytle, 1998).

In this way, prospective teachers are required to develop an understanding of the complexities of the teaching culture including its values, norms, routines, ideologies; and, gradually to absorb and be absorbed by its culture and develop a sense of belonging rather than simply practising technical skills (Barab et al., 2002: Sim, 2006: Stoll et al., 2006). As a result, trainees will understand tacit aspects of the profession and simultaneously construct pedagogical theoretical frameworks for explicating actions, which is, according to Brown (2002), immersion in a CoP. Illustratively, Brown (2002) draws upon the observation of the developmental psychologist Jerome Bruner who drew a distinction between learning physics and being a physicist, to underline that deep expertise lies in the interplay of aligning with the practices of a specific field in addition to learning its facts and theory.

Thus, a kind of apprenticeship involving legitimate peripheral participation activities is advocated by Sutherland et al. (2005) as a meaningful component of initial teacher training that originates in the work of Lave and Wenger (1991). Lave and Wenger (1991) stress the importance of the socialisation of newcomers into a professional CoP that is predominantly situated learning, that is, learning within a specific context. In this way, trainees will explore teaching as a career by taking part 'in both action and connection with others' (Wenger, 1998a: 55) to develop an understanding of teachers' everyday work. They can develop teaching skills by integrating, testing and applying educational concepts in practice (Haldane, 2005: Sutherland et al., 2005: Wenger, 1998b: Beck et al., 2002: Fisher et al., 2007). A proponent of this socio-cultural approach of learning within CoP is Vygotsky who emphasised processes of peer interaction and modelling by expert others, in his theory of individual knowledge growth and cognitive development (Vygotsky, 1978: Hung and Tan-Seng, 2004). Later on, the word 'scaffolding' was coined by Wood et al. (1976) out of Vygotsky's work to underline the importance of helpful interactions of the knowledgeable others to mediate a learner's attempts to build on a new knowledge.

Wubbels' (2007: 225) position contests the present wide-ranging use of the term CoP. He communicates his concern in his paper 'do we know a CoP when we see one?' and argues whether 'learning communities' in school and university environments is a more efficient term for a group of people who are working towards developing their learning rather than a community's practices

(Wubbels, 2007). He even suggests fruitful combinations of both types - learning communities and CoPs - to be developed where neither knowledge is transferred nor is completely self-developed by the members as in the case of a number of online or co-present CoPs designed for trainees where the facilitator's intervention brings out the intentional input for promoting reflection, rather than the participants themselves developing collaboratively their insights into meaningful understandings (Wubbels, 2007).

In fact, Wubbels (2007: 226) advocates that one may 'doubt the suitability of school context for creating such communities'. Similarly, Fisher et al. (2007) argue that realistically considering initial teacher training or any competitive educational settings, especially considering the pressurised settings of today's workplace as Cox (2005) adds, there is sometimes no time, space or opportunities for collective engagement and interaction with colleagues. Rather there is frequently a shortage of time, lack of interaction and collaboration and perhaps much individualistic work. Further, Fisher, echoing Gee (2004, cited in Fisher et al., 2007: 194) adds that 'formal institutions of learning do not automatically guarantee that a group of students becomes a 'community' because 'students may not all engage in teacher-led or curriculum driven tasks willingly or with an unproblematically shared sense of purpose'. In fact, Fisher et al. (2007) explain further that compulsory coursework and individual assessment procedures followed in teacher education do not necessarily contribute towards the notion of being in a CoP.

In contrast to the above arguments, it could be said that it is the pedagogy of teacher education and education in general that aligns or not with the concept CoP rather the other way around. In other words, if the pedagogy and purpose of teacher education is based on and centred to collaboration; it encourages dialogue and social scaffolding within the camaraderie of supportive peer and school communities; then trainees and teachers can be thought of in terms of their belonging to/progressing towards CoP. For example, according to Kirschner and Lai's (2007) view, at the centre of a community's approach to learning dwells discourse and dialogue to encourage enquiry and - consistent with Lemke's (2009) position - teacher learning nowadays converges in one word, that is 'collaboration' as the ongoing interaction of members who work interdependently towards achieving their goals. In these terms, CoP is a legitimate framework for considering the progress of trainees towards learning how to teach. Hence, enhancing and empowering any professional learning community or spontaneously emerging peer CoP in teacher education is proposed. The following section sets the scene in initial teacher training identifying pertinent CoPs.

2.2 Setting the Scene: Two Overlapping Communities of Practice in Initial Teacher Training

Typically, any teacher training institution offers consistently a series of official taught courses on-campus, and blocks of TEs at various schools for educating

prospective teachers. As a result, any trainee, either undertaking a four year undergraduate level course or nine months' intensive PGCE programme in secondary or primary education in the UK, has to cope simultaneously with the demands derived from participation in two contexts: university and schools, which means constantly switching between the roles of a student and a teacher (Pratt, 2008: Jyrhämä, 2003). In fact, initial teacher education has been over the past twenty years sharply school-based (DfE, 2010b), which means that trainees are active in meeting the goals of two curricula: that of the school and the university (Jyrhämä, 2003). Thus, according to Fisher et al. (2007: 191) teacher professional development through the lens of CoP concept emerges into two 'diverse yet interrelated' and overlapping CoPs. While one recruits trainees in the 'university learning community' of fellow students and university tutors (Fisher et al., 2007), the other actively engages trainees in the 'professional practice community' of experienced teachers, teacher mentors and staff at schools, who negotiate the meaning of their enterprises, create their own practice and establish their own identities, and ways of viewing the world (Buysse et al., 2003: Eisenschmidt, 2006).

Although it may be tempting to consider the two professional communities as totally collaborating with each other, in reality they represent two related but different 'worlds' (Walkington and Vanderheide, 2008: 4). Explicitly, the two professional communities are diverse because they acquire their own goals, experiences, identities and practices. However, the two professional communities are interrelated because they represent the new and the existing

generation of educators and they overlap because trainees have to exist in both communities for an extended period of time in order to become effective educators (Barab et al., 2003: Banks et al., 2004). In this way, 'knowing is distributed across [the two communities] and across resources such as books and computers, and learning is the movement from peripheral (novice) to full (expert) participation in the work' (Kelly, 2006: 507). This means that trainees initially participate peripherally in the community of professional teachers as a part of the process of realising their learning trajectories which are successive forms of participation and identity (Wenger, 1998b: Kelly et al., 2007).

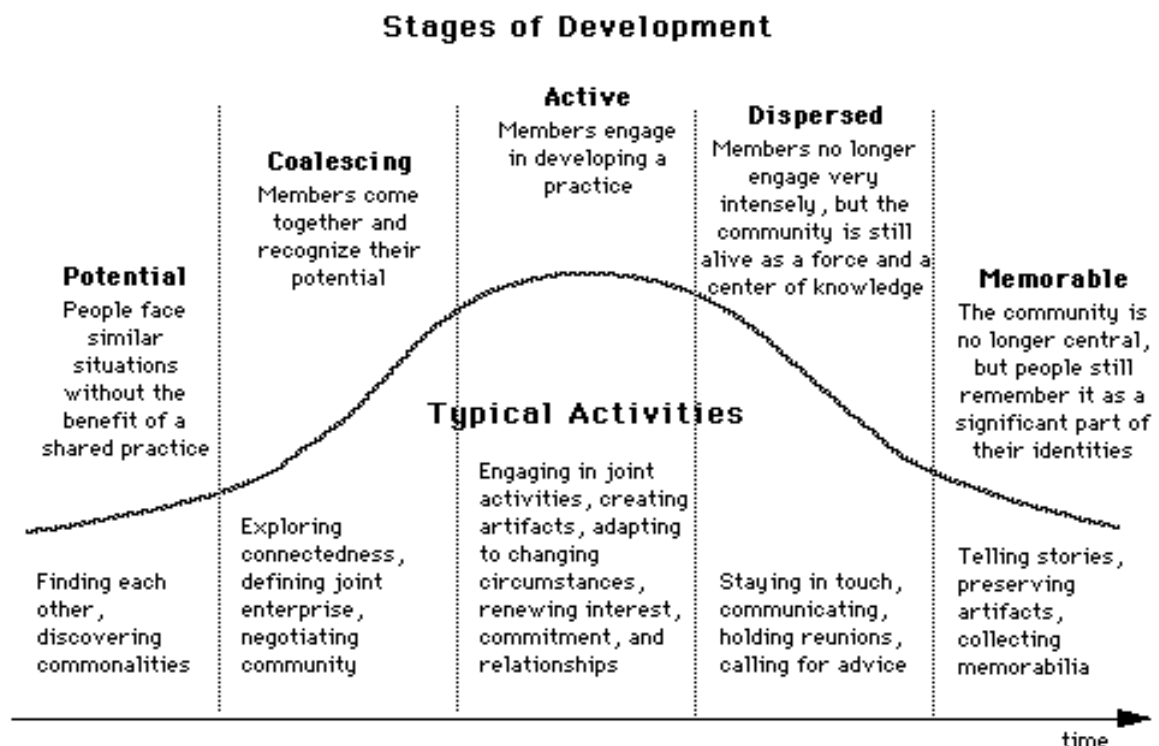
Each one of these elements of conceptualising initial teacher professional development: peripherality, trainees' identity transformation and learning trajectory, is discussed in this study, focusing firstly on how trainees progressively engage within the professional school CoP.

2.2.1 Engaging within the Professional Learning Communities at Schools

Once trainees arrive on a teacher education programme they engage dynamically within the university learning community in which – in the context of 'becoming a teacher' - mutual relationships are worked out, multiple ideas are shared, joint activities are pursued and common goals are articulated. In time, trainees will meet their teacher mentors at schools, will share personal

information and will identify common ground on which to build their learning for moving swiftly to a higher level of participation in the community of teachers (Fisher et al., 2007; Barab et al., 2002). Wenger (1998a) identified these two initial phases as the potential and coalescing phase (see Figure 2.1) at which people primarily come together to realise their potential in working together for a common purpose. In this case, the focus is on becoming teachers. Fisher et al. (2007) use Wenger's (1998a) developmental stages of a CoP to provide a framework for understanding trainees' professional development in a Graduate Diploma at Central Queensland University. He argues that as soon as trainees and teacher mentors identify the potential for working together and plan their next steps based on the trainees' individual needs, they move directly towards the third active stage at which action is taken (Fisher et al., 2007: 195).

Figure 2.1: Wenger's (1998) Stages of Development of a CoP, which were adapted by Fisher et al. (2007) to trainees' professional development



According to Fisher (2007), in the active phase of sharing knowledge and making contributions in enterprises, trainees participate alongside all members of the professional community in schools including teachers, teacher assistants, administrators and parents for developing their practice *within* the community. At this point, Fisher et al. (2007: 195) claim that trainees (novices) and teachers (experts) participate in a medley of activities from 'doing playground/bus duty, curriculum planning, co-teaching and assessing, attending staff meetings, participating in extra-curriculum activities'. In short, trainees engage 'in structured learning activities, modelled teaching processes and dialogic encounters in the experienced, lived-world that constitutes a CoP' (Fisher et al., 2007: 192) for developing an understanding of its complex practices, ethical conduct and routines, aiming to become full members over time (Sutherland et al., 2005: Wenger, 1998b: Hung and Tan-Seng, 2004: Barab et al., 2003).

The trainees' immersion in the community of teachers would involve engagement in joint activities, taking responsibilities, and in effect, it would mean individual identity construction as well as denoting community evolution (Barab et al., 2003: Barab et al., 2002: Fisher et al., 2007: Kirschner and Lai, 2007). In other words, as Stuckey et al. (2001) claim, trainees contribute to the community as well as they learn from it, because new members always contribute new ideas, thus the meaning of pursuing enterprises is re-negotiated, and practices evolve.

However, for the majority of the trainees this active phase of intensive participation in the community will shrink as the fourth phase of dispersal will approach by the end of the course (Fisher et al., 2007). During the dispersal phase, Wenger (1998a) argues that members discontinue from engaging intensively in the community's practices although the community is still alive as a source of knowledge, since members stay in touch, seeking advice from one another. In time, they will probably remember with nostalgia the community in which their teaching identity originally evolved and they might even use the artefacts, the memorabilia they have 'developed and preserved as teaching/learning resources' at their new appointments (Fisher et al., 2007: 195). 'Stories from those times would be resurrected whenever community members meet...' (Fisher et al., 2007: 196). However, professional learning communities at schools are not the only CoPs emerging in a teacher training course.

2.2.2 Engaging within the University Learning Community

As Barab et al. (2002: 238) point out, trainees not only engage in the professional community of teachers but also in the university community of trainees, the characteristics of which are discussed here. The CoP of trainees is an educational community that evolves during trainees' studies and has preceded their arrival as it has a history of practices. Hence, it is not static but dynamic and changing (Barab et al., 2003). Since trainees may bring to the course multiplicities of experiences, represent different backgrounds and

subject domains, belong to different age group, acquire a variety of creative skills and have uneven levels of expertise, they may bring different contributions to the course (Barab et al., 2002: Malderez et al., 2007).

Students are enabled 'not only [to] construct their own knowledge (constructivism) as result of interacting with their environment (social constructivism), but also [to be] actively engaged in the process of constructing knowledge for their learning community' which is a pedagogical concept called communal constructivism (Holmes et al., 2001: 1: Coyle et al., 2006: Leask and Younie, 2001). Although this model has been criticised on the grounds that it is not really another form of 'constructivism' since it is not an updated theory of how students learn, it is, however, a pedagogical model of interaction of the students with their peers (peer tutoring) and with the larger learning community that promotes best methods of teaching and learning (Pountney et al., 2002: Scrimshaw, 2001). According to the communal constructivist model, courses become dynamic and adaptive and the participants become constructors of new sets of knowledge resources that will be continually updated (Holmes et al., 2001). In this manner, trainees are encouraged as learners to leave their imprint on the system, they no longer pass 'without leaving a discernable trace' (Holmes et al., 2001: 1).

As with any other CoP, the CoP of trainees is considered to be a medley of people who engage in a common practice representing diversity in conjunction

with homogeneity (Wenger, 1998b). In fact, regardless of the route taken in initial teacher education, there are 'core features' recognised 'in the lived process of becoming' a teacher for the majority of trainees including having the same goals and having to undergo a highly emotional period of time during training (Malderez et al., 2007: 226). Explicitly, many trainees in the UK reported Malderez et al. (2007: 231) acquired as a common starting point their perceived need to undergo a transformation of their selves – their identity - into teachers, in other words, to realise a role-shift from trainee to teacher. Although this is the norm, there may be some trainees less open to changing their identity during learning the craft of teaching (Malderez et al., 2007). Another aspect that brings trainees together is that the vast majority of them undergo an 'affective-charged' journey during becoming teachers (Malderez et al., 2007: 236). This can become visible in the highly emotive language used by many to describe their experiences of becoming teachers 'with words such as 'excited', 'love it' and 'relaxed' on the one hand, and 'worry', 'panic', 'overwhelming' and 'shock' on the other, being frequently used' (Hobson et al., 2008b: Malderez et al., 2007: 236).

It is further clearly delineated in the data of Malderez et al. (2007), Hobson et al. (2008a) and Dinsmore and Wenger's (2006) studies that the three major factors producing emotional responses, positive and negative impressions and influence the trainees' learning are their relationships with their peers, relationships with mentors and relationships with tutors; in other words with 'significant others' (people whose opinion matters personally to them). Malderez

et al. (2007) and Hobson et al. (2008a) add that trainees' perceived effectiveness in the classroom in bringing out pupils' learning also plays a key role. The report commissioned by the DfE attests that fostering and maintaining a 'fully functioning and cohesive [trainees] learning group' is an important component in helping trainees navigate their journey to becoming a practising teacher, through focusing initially on engaging actively in the role of being a trainee (Malderez et al., 2007: 243). Dinsmore and Wenger (2006) explain that although it is sometimes the case that the negative relationships with peers are strong enough to inhibit some trainees' learning, trainees working together towards the same goal, providing peer feedback to assist one another in reaching higher levels of performance, showing trust, developing collegial relationships and engaging in social interactions with peers, helps them to understand the dynamics of such a learning environment.

A number of other researchers (Sim, 2006: Barab et al., 2003: Banks et al., 2004) also claimed that trainees at the beginning of their career acquire their own ways of doing, attitudes and beliefs, shared language along with a great number of similar goals and initial experiences. This is shown by the fact that teacher educators do recognise a change in trainees' ways of talking before and after receiving concrete experiences at schools (Sim, 2006). A distinction can be noted between the remarks and suggestions of a newcomer in the profession and those of a teacher mentor, who is an experienced member in the profession even though any suggestion may be perceived correct in everyday teaching and learning praxis (Kirschner and Lai, 2007). For this

reason, Gao's (2010: 243) research showed that the self-initiated learning community of trainees is valued because trainees share a similar teaching philosophy and develop a sense of belonging in the same professional community by interacting with each other physically and regularly on a friendly basis. It was found that within their community, trainees 'changed and reinforced conceptions of teaching and learning through presenting their own ideas, as well as hearing and reflecting on the ideas of their "education friends"' (Gao, 2010). Similarly, Sim (2006) valued the existence of tutorial groups for secondary trainees who worked in the same or close school TE, because they were found effective in enabling critical reflection, connecting theory and practice and building effective relationships at school. This connection between the theory and practice involved in becoming a teacher is discussed in the next section.

2.2.3 Theory and Practice in Teacher Education

'Ideas about how people learn necessarily have implications for how people should be taught - the link between theory and practice' (Pountney et al., 2002: 2) hence the 'theory-practice' relationship is central to teacher training. In his (1998b) work, Wenger argues that theory and practice are interwoven, although Brown (1989) identifies that learning is sometimes detached from the actual situations that occur, resulting in de-contextualisation of knowing. Cochran-Smith and Lytle (1992: 298: Cochran and Lytle, 1998) assert that 'the breach

between learning and use, which is captured by the folk categories 'know-what' and 'know-how' may well be a product of the structure and practices of our education system'. Brown (2002) explains that the know-what dimension may represent the explicit content knowledge whereas know-how deals with a tacit dimension manifested in workplaces. Similarly, teaching involves applying content knowledge (what to teach) into teaching practice (how to teach) and developing an understanding of how these two unite into a single entity in order that trainees evolve to be effective and pedagogically aware teachers (Husu, 2000).

Shulman (1986: 8-9) underlines that the *content knowledge* of teaching that includes 'the amount and organisation of knowledge per se in the mind of the teacher', the concepts and principles of a discipline, should not be shallow nor underestimated because how can a 'teacher prepare to teach something never previously learned?' Banks et al. (2004), distinguish between content knowledge per se and school knowledge, that is the conversion of content knowledge for school didactics or what Jyrhämä (2003) refers to as subject didactics. Banks et al. (2004) also add that there is the personal subject construct of each teacher and the pedagogic knowledge. What is considered to be pedagogical knowledge in this study needs therefore to be clarified here. Pedagogical knowledge incorporates the interpretations of classroom events and the rationale that supports the teachers' actions during teaching that is related to teaching practice, classroom and behaviour management (Husu, 2000; Loughran and Berry, 2005; Edwards and Protheroe, 2003).

Along similar lines, Jyrhämä (2003) adds to the two already mentioned interacting contents of teacher education, subject didactics and teaching practice, the theory of education itself. A number of trainees in Malderez et al. (2007) identified theoretical knowledge as encompassing a range of issues including how students learn, child psychology, legal issues related to child protection and knowledge that supports teaching, assessment and planning. Interestingly, many respondents questioned the relevance of theory to what actually happens in schools. However, Coyle (2004) and Banks (2004) propose that it is the interrelation between all these dimensions which construct teacher professional knowledge. Explicitly, becoming professionally knowledgeable in teacher education entails developing skills for applying theoretical knowledge in professional practice at various schools (Henderson, 2007; Sutherland et al., 2005; Hixon and Sanborn, 2005).

Shulman's (1986: 8) concept of *pedagogical content knowledge* (PCK) is also important in this context. It answers questions like 'how do teachers take a piece of text [content] and transform their understandings of it into instruction that their students can comprehend [pedagogy]?' Shulman (1986) explains that the content knowledge should be blended with elements of the teaching process that includes classroom/time management, planning, structuring a lesson, praising pupils – in other words, content with the pedagogy. Thus he coined the concept of PCK the 'knowledge of the subject matter *for teaching*' (Shulman, 1986). This is not the subject matter per se but is how a subject is taught and based on which pedagogical decisions actions are taken. This

involves ‘the ways of representing and formulating the subject [to] make it comprehensible to others’ for example what is easy or difficult about a topic, which conceptions or misconceptions do the pupils bring with them to the lesson and which strategies to use to bring out pupils’ understandings (Shulman, 1986).

Recently, the DfE (2010b) underlined the need for expanding trainees’ subject knowledge especially in literacy and numeracy and academic preparation as well as developing their communication and interpersonal skills with parents and colleagues. Consequently, a number of researchers agree that close partnerships between universities and workplace learning is a key strategy for attaining authentic applications of theory in the real-world (Walkington and Vanderheide, 2008; Fisher et al., 2007). However, rather than considering work-based placements as merely a service of the professionals to the university or other institutions, Walkington and Vanderheide (2008) suggest cooperative partnerships and sharing of expertise between members of the two communities, universities and the professional world. This could result in developing a wider CoP for trainees to learn new ideas *from* the school as well as bring new ideas *to* the school. In this way, teachers can support or challenge perceptions about traditional practices and evolve ideas.

Explicitly, a headmaster in Kynäslahti et al.’s (2006: 253) study reported satisfaction in the pedagogical contributions and ‘updating’ of knowledge that

the newcomers, the trainees, diffused throughout his school. In the same way, Fisher et al. (2007) argue that the combination of the professional teachers' knowledge with trainees' emerging knowledge from the wider learning that takes place in teacher education, may have a positive influence on the learning and teaching of all members. According to Wenger (1998b: 94), 'a question gives rise to discussion; a conversation sparks a proposal; new ways are tried out', problems are then identified and discussed, solutions are applied, situations improve or get worse, people join in or move out, mutual relationships and forms of participation are renegotiated. All these are characteristic of a CoP (Husu, 2000: Jennings et al., 1997).

Barab et al. (2003: 513) claim that when communities of trainees were most 'vibrant, dynamic, and relevant, theory and practice became two sides of the same coin' as trainees may well inform their own practices based on strategies and theories learnt at the university. Further, Barab et al. (2003: 514) claim that within these 'fruitful conversations in which community members could synthesise their experiences, work through theoretical notions, and share their struggles', educational practices could be transformed in new directions. Along similar lines, Gómez and Rico's (2007) study underlines the importance of group work for secondary mathematics trainees on given tasks at home which is as valuable as teaching in actual settings. As a result, rather than conceptualise theory versus practice it is preferable to enable new members to engage with both together within CoP (Wenger, 1998b: Barab et al., 2003: Cochran-Smith and Lytle, 1992: Cochran-Smith and Lytle, 1998).

The initial phase of negotiating membership in the community of teachers is the focal point of the following section.

2.2.4 Legitimate Peripheral Participation

Even Wubbels (2007) who stands sceptical on the use of CoP in a school context, believes that the idea of legitimate peripheral participation is powerful in a community of trainees, beginning teachers and experienced teachers. In fact, Harrison et al. (2005b: 421) argue that this situated aspect of learning within the CoP may closely relate to the 'know-how' of learning to teach because 'it is often reassuring to be working in contexts with others who are experienced at solving (or dealing with) similar problems'. Since learning is 'inherently context dependent, situated and enculturating' (Brown et al., 1989: 37) one of the defining characteristics of learning that occurs in CoP contexts is legitimate peripheral participation activities which assemble the features of apprenticeship in the workplace for newcomers like trainees (Sutherland et al., 2005: Lave and Wenger, 1991).

Unlike course requirements that may expect trainees to perform complex tasks, take over every component of teachers' roles and address problems, in peripheral participation activities trainees are able to work on undemanding sub-tasks, observe and shadow experienced members and acquire limited responsibilities as teachers (Wenger, 1998b: Lave and Wenger, 1991: Lueg,

2000: Sutherland et al., 2005). Therefore, peripherality involves 'lessened intensity, lessened risk, special assistance, lessened cost of error, close supervision, or lessened production pressures' yet it 'provides an approximation of full participation' to the practices of the community which 'gives exposure to actual practice' (Wenger, 1998b: 100: Lave and Wenger, 1991). Essentially, there are various forms of participation in a community that depend on members' expectations and previous experiences in a specific community, including peripheral, marginal, partial or full participation, and they are all useful for the community and for the members (Kelly et al., 2007). For example, legitimate peripheral participation is a kind of partial participation that gives an opportunity for newcomers to 'hold back' whilst being 'close' and observe, pose questions, interpret, and learn from experts (Wenger, 1998b). This kind of participation is considered useful for newcomers in a profession.

Peripherality denotes a degree of participation in a community, not a physical location nor a quantity of knowledge acquired (Wenger, 1998b: Squire and Johnson, 2000: Lave and Wenger, 1991: Hildreth et al., 2000). Specifically, being a peripheral member in a community means getting explanations and implementing observations but most of all it involves taking part and having access to all three dimensions of practice, namely:

- *mutual engagement* in actions which are re-negotiated by the members to remain meaningful;

- *joint enterprise* which makes work real and liveable although partly influenced by uncontrolled rules, policies and standards;
- *shared repertoire* of resources, artefacts and symbols which assist the negotiation of meaning, pursuing of specific activities, and forming of identities (Wenger, 1998b).

Hence, in the process of recruiting new members not only do members transcend their learning and evolve their identities but the community itself is also reconfigured in an ongoing process because special measures are employed to accept the newcomers (Henderson, 2006: Wenger, 1998b: Squire and Johnson, 2000). These include coaching, shadowing, modelling, and interviewing which are all processes by which trainees learn how expertise is 'manifested in action, in conversation and in relation to the world' (Brown et al., 1989). Explicit roles, 'rules and regulations', 'implicit behaviours and unstated rules of thumb that make the culture of the community unique' are shared among members within CoP context (Hung and Victor, 2002: 148).

Professional teachers reveal tacit knowledge of their profession and demonstrate strategies to empower new members to adapt to the rhythms of the community. These processes although requiring a major amount of effort, time, good will and energy on the part of the experts who receive no extrinsic reward to share their knowledge and support novice members are essential (Brown et al., 1989: Wenger, 1998b: Sutherland et al., 2005). 'Wenger

contends that the sharing of tacit corporate knowledge is vital to the organisational success'; because this knowledge is not distilled, documented in written form nor it is absolute, it is information shared between colleagues at work on an ongoing 'need-to-know', 'need-to share' basis for avoiding struggles, asserting actions, looking at new challenges and overall becoming effective at work and setting new goals (Stuckey et al., 2001: 1).

Further, the term *legitimacy* in legitimate peripheral participation is associated with the social and human relations developed between newcomers and experienced members. It is the degree of confidence, encouragement and assurance received by newcomers through approaching experienced members and gaining understanding of what is valued in a profession (Sutherland et al., 2005: Brown et al., 1989). It is a constituent element of participation, as newcomers need to be treated as potential members to acquire the opportunity of engaging and of 'growing into the role of a full member along with its rights, responsibilities, and capabilities' (Lueg, 2000: 2). Explicitly, trainees participating for the first time in a school context and taking a class are initially concerned to gain acceptance by the community, hence the focus is on themselves, on their identity and on their performance as teachers, then gradually their concerns turn on pupils' behaviours and finally their attention is turned on pupil learning (Malderez et al., 2007).

This could be linked to the Concerns-Based Adoption Model (CBAM) of Hord et al. (1987) which relates to how educators, in this case trainees, respond to change. This framework may have implications for the practices of any professional development programme since it seeks to unravel the questions asked by learners at different stages in their learning trajectory starting from self-oriented questions and task concerned-matters of the type: 'what is it I need to change? How will it affect me? How do I do it?' Only once those concerns are settled and resolved does the focus then turn onto the impact (for example, teachers may ask 'is this change having a positive impact on my students' learning?'). By this time, a need to coordinate with other professionals is also generated, seeking to pursue more effective practices (Hord et al., 1987). Along similar lines, Malderez et al.'s (2007) research calls for the teacher training institutions to pay attention to addressing the concerns and aspects of self-knowledge and emotions of trainees in different phases of their learning and identity transformation.

Overall, what has been argued in this section is that all three aspects: legitimization, peripherality and participation are indispensable as they embrace the various ways of belonging to a community, the degree of engagement and identity formation in order to advance from a student/novice status to a full member in a community (Wenger, 1998b: Squire and Johnson, 2000: Lave and Wenger, 1991: Hildreth et al., 2000: Henderson, 2006). In other words, becoming a teacher involves participation in practice and gradual construction of a teaching identity.

2.2.5 Developing professional identity

Professional development in teacher education means becoming capable of joining a wider professional community of teachers through gradually developing various forms of dynamic and changing identities (Henderson, 2007: Wenger, 1998b: Henderson and Bradey, 2008). Hence, CoPs are considered sites of enculturation, that is cultural and social contexts where new members align their identities and practices based on their understanding of how the work is pursued and how to interact with it (Henderson and Bradey, 2008: Henderson, 2007). In other words, as Kelly (2007) explains, teaching identities evolve where learning is constructed by taking part in the practice of a community, by exploring and interpreting the meaning of the pursued activities and by changing stances towards tasks and towards other members in the light of those experiences. Kelly (2006: 507) uses the term identity-in-practice to illustrate that identity is revealed 'in the stances teachers adopt in their working lives' each day. This is achieved not just by taking part in a community, but as Wheeler et al. (2005: 128) add, it is actually through constant reflection and self-assessment that trainees may gain an understanding of the 'representation of [their] self within the context of professional practice'.

As already argued in this chapter, the dimension of how other (existing) members position the new member is as much a part of identity construction as that new member's image of him or herself (Kelly et al., 2007). This means that

identities are not only affected by trainees' own actions and understandings but also by the actions and understandings of other members of the teaching community whom they encounter, and with whom they interact and develop relationships (Malderez et al., 2007: Wheeler et al., 2005: Fisher et al., 2007: Wenger, 1998b). This is echoed by Barab et al. (2003), who argue that trainees define their identities through their own insights and reflections and through the various implicit signs conveyed in the actions of the others. According to Wenger (1998b: 151) 'these layers build upon each other to produce [their] identity as a very complex interweaving of participative experience and reificative projections'.

Another factor influencing one's perceived identity that was identified in Wenger's (1998b: 150) work is the explicit, external process of representation of one's self by the institution he or she is in, including 'official markers of transition' which indicate institutional reification of competence. Explicitly, these markers reveal members' progress from one level of competence to another as they achieve 'certain performance milestones' (Wenger, 1998b: 150). This representation refers to the institutions' views of each member's level of expertise which comes with certain responsibilities and privileges (Wenger, 1998b). Based on Wenger's (1998) work, Fisher (2007) says that trainees develop their identity and practices within their university community, conforming to the requirements of their teaching institution which is considered as an external mandate, but it is actually the community itself that produces a practice and an identity as a response to the external mandate.

Requirements may not only be imposed by the teaching institution, school or university but as Kelly (2007) argues, requirements are sometimes said to be imposed by National guidelines. Explicitly, Kelly's study (2007: 156) claims that over the past fifteen year teachers in maths and English in primary schools have been 'acquiescing to their assigned technicist identity' which means that they have been adhering to prescribed practices in order to boost pupils' achievement on the National Literacy and Numeracy tests. Teachers' identities have been manifested in practice within this instrumental climate (Kelly et al., 2007). At times when this assigned identity conflicted with their teachers' own perceived teaching identities, teachers either gear their practices to government requirements, or deliberately reject the identities which sometimes resulted in their departing from the profession or subvert their practices as an action of resistance against adopting the positions (Kelly et al., 2007).

Kelly et al. (2007) argue that an alternative to a technicist position is a reflective position based on Schön's work that leads to a more proactive stance within the profession. It is argued that this reflective practice may well be developed in peer collaborative environments that promote teachers' self-awareness and employing more pedagogically-reasoned positions (Wheeler et al., 2005: Kelly et al., 2007). The value of such reflective practice mediated by technology will be discussed in the second part of this thesis but first, the process by which trainees become aware of the changes that happen to them at a personal level during learning the craft is considered here.

2.2.5.1 Identity as a learning trajectory

Wenger (1998b: 149) argues that 'we define who we are by where we have been and where we are going' in our learning, hence identity is a learning trajectory. Identity as a learning trajectory represents a sharp and meaningful concept for understanding the trainees' identity development. As already mentioned trainees' identity construction is not a linear process nor something fixed, predetermined or unchanging; rather it is a temporal, ongoing process constructed by the 'interaction of multiple convergent and divergent trajectories' (Wenger, 1998b: 154). This means that each trainee builds on his/her own possible learning trajectories which might converge with or deviate from each other and other members both within and across CoP.

In this specific case mentors and professional teachers are the models upon which the newcomers will draw for 'growing into' the role of the profession. However, as members' identities are constantly changing and re-negotiated as new experiences and ongoing professional development never ends, members including professional teachers and teacher mentors are seen as living examples of possible paradigmatic trajectories as well as sources of information (Wenger, 1998b: Fisher et al., 2007). Experienced teachers and mentor teachers are called paradigmatic because they are 'testimonies to what is possible, expected, desirable' (Wenger, 1998b: 156). 'Exposure to this field of paradigmatic trajectories is likely to be the most influential factor shaping the

learning of newcomers' (Wenger, 1998b: 156). However, newcomers do not necessarily align their own trajectories with the paradigmatic trajectories but are encouraged to seek out their own unique learning trajectories. Such a process is legitimate because it allows evolution of the social practice (Wenger, 1998a: Brown et al., 1989).

Depending on where a member is located in the context of a CoP there are a number of different types of trajectories. Some of them are the *peripheral* trajectories which may 'never lead to full participation', *outbound* trajectories which 'lead out of a community' in contrast to the *inbound* trajectories which acquire the prospect of leading to full participation. The latter trajectory is the one that the majority of newcomers including trainees 'reside' because there is the potential of full participation in its future (Wenger, 1998b: Henderson, 2007).

2.2.5.2 Identity as a nexus of multimembership

At times members belong to and participate simultaneously not only in a CoP but they may participate in the different practices of a number of CoPs which means they develop their identities as a nexus of multi-membership in these various communities. Explicitly, according to Buysse et al. (2003) teachers' identities might be a product of being (for example) both a scientist and a practitioner or according to Henderson and Bradey (2008) a professional in a study field and an educator. In initial teacher training, trainees need to cope

with and fulfil both the demands of the teacher education's institution, and the demands of being in the classroom and at schools as novice teachers (Pratt, 2008). At the same time, trainees might be parents or members in the practices of other communities (Pratt, 2008: Dinsmore and Wenger, 2006). Malderez et al.'s (2007) research emphasises the importance of social relationships, of family membership, friendships and peer group, because these influence trainees either positively, by enabling them to acquire emotional and practical support, or negatively, if those produce feelings of guilt for not having enough time to dedicate time to the family during their training, or having to meet financial deadlines.

One of the key areas of the present research which appears sparsely in the existing literature is 'the potential conflicting nature of roles' that trainees acquire as they shift their learning trajectories within and across the two already mentioned overlapping but diverse CoPs: the university and professional teachers' community (Walkington and Vanderheide, 2008: 7). Since, according to Wenger (1998b: 160), 'different ways of engaging in practice may reflect different forms of individuality, different forms of accountability may call for different responses to the same circumstances, elements of one repertoire may be quite inappropriate, incomprehensible, or even offensive in another community', participation in the two communities represents a challenge for the trainees. Hence, negotiating shared practice and defining the expectations and working conditions between the two contexts are specifically some of the challenges faced by students who are spanning the two CoPs, university and

workplace contexts (Walkington and Vanderheide, 2008: Fisher et al., 2007). Any emergent confusions and conflicts across cross-cultural perceptions and working conditions can be negotiated within the CoP context because interdependent learning is an important feature of the CoP notion (Gómez and Rico, 2007).

Notably, participation in two overlapping CoP does not necessarily nor merely imply conflicting identities and confusions but it may provide uniqueness of members' experiences within rich and complex social communities (Wenger, 1998b). As a result, 'the nexus between one's personal history, cognition and socio-cultural history as a member of multiple, sometimes conflicting, CoP' makes what s/he is (Henderson and Bradey, 2008: 91). The notion of 'nexus' of one's identities does not entail merging all trajectories, rather that multiple trajectories either conflict with or reinforce each other (Wenger, 1998b). Certainly it takes efforts in reconciliation processes which means bridging in various ways the forms of multimembership can coexist even if this yields successful resolutions or constant struggles (Wenger, 1998b). 'The work of reconciliation may be the most significant challenge faced by learners who move from one CoP to another' because learning 'involves more than appropriating new pieces of information' (Wenger, 1998b: 160).

As Eraut (2007: 404) explains, people participating in two contexts are 'bilingual' but not necessarily good 'interpreters'. In order to become good

interpreters they need to find ways to apply knowledge learnt at the higher education institution in a workplace context which is mediated by tacit knowledge and information learnt only in practice (Eraut, 2007). Malderez et al. (2007: 241) also believe that there is a need to develop 'a shared language' between the two partners. An experienced teacher may well engage in practice and take pedagogical decisions unconsciously after several years in the profession but s/he might need to put their reason for pursuing an action into words which would produce useful conclusions for trainees (Malderez et al., 2007).

In teacher education there are a number of 'community brokers' to assist trainees 'shift their trajectories into increasingly centripetal practices' and fundamentally to co-exist with experienced teachers 'in mutual, accountable and negotiable ways' by sharing working conditions, having lunch breaks and meetings together while compromising with the guidelines and requirements of a particular setting, in this specific case, a school (Henderson, 2007: 163: Wenger, 1998b). Those 'boundary-spanners' who broker across educational and professional boundaries may be the supervisors or mentor teachers who aim to enhance meaningful partnerships between university and schools (Walkington and Vanderheide, 2008: Fisher et al., 2007). Boundary-spanners exhibit dedication, 'highly effective interpersonal skills' and understanding of the 'cross-cultural perceptions and ways of work' and of 'the potential conflicting nature of roles' and therefore they are 'able to negotiate shared practice' (Walkington and Vanderheide, 2008: 7). They are responsible for facilitation,

communication, action and interaction between members of the university and professional community for respecting and setting clearly the expectations and working conditions of two or more contexts (Walkington and Vanderheide, 2008: Fisher et al., 2007); 'Issues of administration, responsibility and learning are clarified through respectful boundary spanning' (Walkington and Vanderheide, 2008: 7). Similarly, boundary objects including documents for lesson planning are employed to link the professional work at school with the learning context at the university (Gómez and Rico, 2007).

Over the years, several technological tools have been employed in various ways in teacher education in an effort to support a diversity of activities and partnerships between teacher education institutions and schools (Fisher et al., 2006). A brief discussion of new and emerging tools employed in teacher education, is the concern of the next section. The discussion then moves on to the reasons why the technologies are employed to promote CoP in teacher education, with video conferencing in focus.

2.3 New Technologies in Initial Teacher Training

Videodisks, videotapes and/or digital video have long been widely employed in initial teacher training to enable trainees to acquire shared experiences of various teaching styles, implement anytime-anywhere classroom observations, and have adequate time for reflection by implementing review events (Hixon

and Sanborn, 2005). The opportunities for analysis, discussion and reflection are the main reasons for widely employing classroom videos in teacher education (Comber, 2011). Analysis of videos were found to be particularly useful when taking place within peer communities and when scaffolded by more experienced teachers or university tutors because in this way connections between theory and practice and between practice and research could be drawn and attention be directed on the essential elements of teaching, including pupils' learning and pedagogy (Comber, 2011). In this way, classroom video can help university tutors to control their trainees' classroom observations and promote connections to university sessions' content. For example, Santagata et al.'s (2007) study employed digital video lessons along with text for maths trainees to develop their analytical skills during classroom observation. The study revealed that it is not the amount of time dedicated to classroom observations that affects the quality of trainees' analysis and interpretation, but the reflection on and directions given by experts about commonly observed video-taped lessons, assisting the trainees to acquire an 'explicit observation framework' (Santagata et al., 2007: 139). According to Hixon and So (2009) this will assist them to be cognitively prepared in order to take full advantage of their subsequent field experiences.

On the other hand, it is argued that video cases have a number of limitations including that the observations are restricted to single camera angle; there is no opportunity for browsing in the classroom at will; and, that the teaching does not take place in real time (Hixon and Sanborn, 2005). Therefore, video cases

cannot provide opportunities for trainees to interact in real-time with the observed classroom nor to participate actively in teachers' CoP. Along similar lines, the free-to-air channel, teachers.tv, which has recently ceased operation but the archive has been transferred to distributors' websites for example <http://www.tes.co.uk> and any other repository of knowledge built on pre-constructed digital videos can provide the opportunity for teachers to navigate through a wide selection of teaching resources and find practical suggestions and personally useful materials; but there is limited or no interactivity between the provider and recipient or between recipients, in this case teachers (Comber, 2011: teachers.tv, 2004). As a result, there are not many opportunities for enhancing teachers' deep ongoing reflective practice (Comber, 2011)

Comber (2011: 18) distinguishes the videos professionally produced for general consumption from the videos produced 'in-house', capturing practices so that teachers can interpret features of their own and their peers' classroom practices within a school or an institution. He argues that the latter 'is more effective in promoting reflective practice', having more authenticity and pedagogical value (Comber, 2011). This has emerged in the video-club groups of Sherin and Van Es's study (2009) in which teachers were asked to produce video segments of their own classroom practices and subsequently to reflect on them along with colleagues in face-to-face meetings. Explicitly, the video clips 'looked similar to what the teachers encounter each day' therefore they had a positive effect on their everyday practices (Sherin and Van Es, 2009: 172). In particular, the study found that teachers observed more 'closely', in the video clips they viewed, their

pupils' mathematical ideas which they normally would have missed in the busyness of their classes. This helped them to raise awareness about their pupils' thinking and shift their actual teaching practices toward eliciting their pupils' ideas to develop their meta-cognitive processes (Sherin and Van Es, 2009). Meta-cognition refers to reflecting back on one's own thinking processes.

Based on the same beliefs, a study by Kong (2010) developed a web-enabled video system for trainees to self-monitor the video recordings of their own teaching performance at schools and subsequently, to retrieve these online videos for promoting critical self-reflection. Online self-reflection forms completed by trainees before and after viewing the videos and the video-booking marking function of the system assisted them in externalising their thoughts and then reinternalising and recontextualising pedagogical teaching and learning strategies, classroom management and discipline techniques (Kong, 2010). However, the author concludes that the synergy of self-reflection with professional mentoring by a supervisor would have enhanced aspects of teaching quality that the lone trainees did not reach, for example, pupil-teachers relations and lesson planning (Kong, 2010).

Other studies have employed technological tools to enable trainees not only to engage in self-reflection but also in peer reflection and scaffolding. A research study combined a web-based environment with video clips showing evidence

that trainees were enabled 'to observe, discuss and reflect on pedagogical theory and practice anchored to actual teaching vignettes' within virtual peer communities (Barab et al., 2001: 72). Comparative results in Hawkes and Romiszowski's (2001) study between teachers' contributions in face-to-face situation and computer-mediated communication on the same prescribed pedagogical curricula, shows evidence that face-to-face interactions failed to reach the breadth and depth of the critical reflection enabled via computer-mediated communication. Kelly et al. (2007) add that it may be the asynchronous written nature of online community that supports less confident students, despite the variation in their academic and technological confidence, because it allows thinking and composing time before contributing. Chapman (2005: 221) reiterates this in his comment that 'the power of asynchronous communication is that it allows participants to join in online conversation at their convenience, to reflect upon what was written, and then to return to affirm, clarify or challenge'.

Similarly, Kelly's (2007) study found that writing reflections as opposed to talking, helped a number of teachers to adopt a more reasoned and controlled daily professional stance that resulted in repositioning their identity-in-practice. Though not all participants felt comfortable or willing to engage in risk-taking reflective practice, those who benefited from collaborative problem-solving discussions reported that having time to compose, edit and think through postings brought a better awareness of their individual views of the self and the suggested positions offered by other colleagues (Kelly et al., 2007). Thus, it

was revealed that 'online discussions [in a university Master's course in education] provide a professional support forum which is lacking at work' for employed part-time primary, secondary and further education teachers and it goes beyond friendly chatting; it is rather a critical reflection on specific professional practices of the specialist or interest area of each particular teacher (Kelly et al., 2007: 173).

Along similar lines, Wheeler et al.'s (2005) study based on the University of Plymouth's Integrated Masters Module Programme for primary and secondary schools and further education colleges, found that developing reflective practice within collaborative discussion groups on problem-based real-life situations resulted in raised self-awareness, a better understanding of the one's own practices and ultimately in changes to trainees' identity. As Wheeler et al. (2005: 129) explain, reflective practice within collaborative groups builds, reforms, modifies, and validates the 'images of the self in a professional context'. Wheeler et al. (2005) also found that teachers' personal styles affected their preferences for either using asynchronous online forums or synchronous videoconferences links.

Further, the synchronous medium of video conferencing has also been employed in teacher education, with a growing number of recent references in the literature, many of which are conference papers (Caipingi et al., 2010: Nolan and Exner, 2009: Kamakari and Drigas, 2010). For example a research

study by Kamakari and Drigas (2010) in Greece employed video conferencing along with digital videos in a process called 'microteaching' as it involved self-study and peer focused feedback in an attempt to diffuse lifelong learning in experienced teachers' training. It aimed to cover the needs and demands of Greek teachers for critical reflection on their practices and for augmenting metacognitive processes in order to lead to transformative learning, that is transformation of their selves as teachers and in the long term of the educational system (Kamakari and Drigas, 2010).

Video conferencing had been also used in teacher education for enabling real time remote classroom observations. Although Lehman and Phillion (2004) and Haldane (2005) argue that it is a tool for supplementary learning rather than a substitute for being physically in the classroom since the value of direct first-hand school experience cannot be challenged; Haldane (2005: 4) believes that the technologies have the power to establish new situated learning and 'simulate real-world phenomena and to construct representations of abstract concepts that enable their relationship to real-world phenomena to be understood'. Explicitly, Haldane (2005) argues that there might be elements of teaching and learning that were simply waiting for the right medium to capture and transmit them, particularly tacit knowledge which can be made sufficiently explicit to be transmitted to others through observation and dialogue with experts, by means of video conferencing.

In particular, trainees in Haldane's (2005) study were provided with opportunities to gain insights into the world of experienced teachers and to deepen their understanding of the pedagogy of teaching and learning through direct situated experiences in the workplace. Comber (2011) argues that during video conferencing neither tutor nor trainees know what is going to happen next – unlike videos of practice which although they could represent 'unedited' activity, examples are still selected by the tutor for some specific pedagogical purpose. A detailed discussion on video conferencing implementation in teacher education is presented later in the thesis, but first the use of other technological tools is considered.

Electronic mail, electronic bulletin boards and virtual learning environments are some of the technologies which have been integrated in teacher education courses (Heath and Holznagel, 2002: Teacher Training Agency(TTA), 2005: Rowley et al., 2005). Specifically, virtual learning environments (VLEs) such as Blackboard or Moodle which are learning management system software are popular in such training courses which can be used both for providing resources in a teacher-led model or for enabling learner-centred, constructivist learning (Pountney et al., 2002: Teacher Training Agency (TTA), 2005). For example, a two-year action research implemented at Sheffield University intending to enhance peer communities whilst on TE, via a virtual learning environment (VLE), Blackboard, found that the trainee benefits gained from participation in peer communities were a combination of professional and social (Hramiak, 2010). Explicitly, a reduction in isolation was reported and not so

formal learning took place among a group of people with a shared goal (Hramiak, 2010).

As Coughlin and Kajder (2009: 5) describe, the literature on the use of technologies for teachers' online collaboration is 'a moving target' since the rapid growth of Web 2.0 technologies makes obsolete the currently researchable platforms. 'Just as studies began to appear for teacher use of traditional courseware platforms such as Blackboard or Moodle, teachers had moved on to platforms such as Wikispaces and Ning, which more closely mirror the type of interaction found in social networking sites such as Facebook and MySpace' (Coughlin and Kajder, 2009: 5). That said, the novelty of a technological tool is not the basic criterion when adopting online environments in education, but rather whether it is deemed useful to meet a specific pedagogic purpose.

Further, whether research on teaching and learning draws alongside the introduction of new technologies or not, this does not prevent their adoption in the educational arena (Coughlin and Kajder, 2009). Explicitly, in a case of the English teacher-group in Winston School District in USA, a community online environment called Classroom 2.0 was created in Ning, a social networking site, to support teachers, advance collaboration, and enable collecting, sharing and disseminating data, to trigger effective feedback from colleagues including rough-videoing of class activity captured simply by using mobile phone or flip

video camera (Coughlin and Kajder, 2009). A teacher stated 'I grew a new kind of teaching voice, able to revise, take time, and think for the community and for my students' (Coughlin and Kajder, 2009: 7). According to Coughlin and Kajder (2009) some of the latest teacher learning communities include Google Teacher Academy which is for primary and secondary educators around the globe; Virtual Pioneers, which is a space for secondary teachers in history and multiple other spaces that are constructed in Second Life, which is an online virtual world in which users take the form of avatars, graphical images, and inhabit and interact with each other and create objects in a computer-based simulated environment.

Yet 'with the rate of technological innovation growing exponentially', Coughlin and Kajder (2009: 12) say that 'it is likely that the most powerful environments for professional collaboration are yet to come'. Herrington and Kervin (2007) presenting one of the latest cognitive tools, mentioned ClassSim, an online simulated environment in which trainees can play the role of a virtual teacher who engages in real-life situations even in the most pressured scenarios to tap into their feelings and explore the consequences of their actions in various instances and at their own pace. By contrast to the positive outcomes of the use of latest technological tools, Waters-Adams et al.'s (2009) trial in adapting one of the most popular social networking tools, Facebook, in their research project to generate enthusiasm to trainees and support professional discussion on TE, was unsuccessful. The reason provided by the trainees was that 'facebook was a technology they used for their private lives away from being a

[trainee], and they did not wish to contaminate it with professional dialogue, particularly during the stressful time of school TE and particularly not with tutors participating' (Waters-Adams et al., 2009: 10).

In fact, this suggests that 'successful uses of technology start with a pedagogical view that is in need of the technological tools available and not the other way around' (Wubbels, 2007: 230). This means exploring applications and Web 2.0 technology for a pedagogical purpose rather than using technologies to deliver pedagogy. This suggestion actually sparks the discussion in this literature towards exploring why various technological tools are used to enhance CoPs in teacher education and why video conferencing can be a vehicle, and what may hinder attempts for supporting CoPs.

2.3.1 Why Communities of Practice and New Technologies are prevalent in Teacher Education

Alongside the socio-cultural collaborative approaches of learning, the evolution of the World Wide Web and currently the advent of Web 2.0 technologies has changed radically the way people are educated, communicate, acquire information and contribute in the repertoire of knowledge (Brown, 2002: Fisher, 2004). This impels prospective teachers to lead the change. Since new technologies, especially Web 2.0 technologies, are the latest means for bringing groups of people who have something to share together, online

environments are currently at the forefront of research for supporting CoP in teacher education. Thus, the concept CoP is 'prevalent in several venues for teachers' professional development, especially in online environments' (Baek and Barab, 2005: 161). Through the literature, online learning environments have been used to spur inquiry-based pedagogy (Baek and Barab, 2005), assist trainees develop reflective stance towards practices (Hawkes and Romiszowski, 2001: Sharpe et al., 2003), promote partnership relationships between schools and universities (Gómez and Rico, 2007: Stuckey et al., 2001), and draw connections between the theory and practice of learning how to teach (Fisher et al., 2007: Kelly et al., 2007).

Connections between school and university-based experiences could be realised, and tensions between in-classroom and out-of-classroom experiences could be woven within community-based approaches supported by the technologies (Wheeler et al., 2005: Pratt, 2008: Kynäslähti et al., 2006). In particular, theory became integrated in practice but also practice became integrated into a teacher education course at the University of Helsinki as trainees draw pedagogical issues from their work to be analysed in teacher education, during discussions with fellow students in online forums (Kynäslähti et al., 2006). In this programme, trainees work as teachers in schools during their studies, hence a virtual university along with some face-to-face meetings was the main route in teacher education in this Finnish multimodal programme. A number of technologies including video conferencing and network-based activities assisted teacher trainees to develop meta-cognitive processes in

order to make sense of research-evidence in relation to their own working reality (Kynäslahti et al., 2006).

In fact, in considering any initial teacher education programmes there are always distance and presence situations of trainees being at different times during their training both together and dispersed. Thus, it is suggested that sustaining self-directed and self-initiated university learning communities even whilst on dispersed TEs can have positive effect in supporting trainees' learning (Gao, 2010). The role of technology in helping to support/foster university learning communities when members are in dispersal is pointed out in the literature. For example, Gao's (2010) *Dialogue Project*, was a password protected online course management tool developed in-house for trainees in an undergraduate programme in US to communicate in one-to-one basis with the university tutors and within small groups of peers whilst on TEs. The project provided a virtual space to express themselves without having to be heard or be intimidated by presenting their ideas to a wider audience. Thus, a friendly university learning community assisted them personally and psychologically to overcome stress and practically to share and comment on each other's ideas and artefacts for example, lesson plans, weekly reflective journals that they produced and submitted online (Gao, 2010). Further, they communicated on a daily basis by sending messages to multiple recipients if wanted to receive different responses through the *Instant Messenger* (Gao, 2010). Hence, not only a self-initiated but also self-selected community of peers emerged since

each trainee chose with whom members of the learning community s/he felt more comfortable to interact with (Gao, 2010).

Squire and Johnson (2000) and Stuckey (2001) use the term 'distributed CoPs' to conceptualise the dispersed nature of these CoPs, underlining their capacity to extend beyond the boundaries of a particular location, and in which effort, accountability and knowledge are distributed among members. Dubé et al. (2006) call these communities Virtual CoPs (VCoPs) since the members rely on the technologies to connect with each other and collaborate even though they might also meet in person at times. The technologies can supply suitable, useful and versatile platforms to enable students to engage actively within group discussions at a distance both in synchronous and asynchronous mode of communication (Pratt, 2008).

In fact, through technologies, trainees can allocate ideas and teaching resources beyond school confines and share their experiences in real time with people working in other schools (Hu et al., 2002:1: Sharpe et al., 2003:529: Squire and Johnson, 2000). Fisher (2007: 197) borrows the words of Kelly (1994: 22) to suggest that online spaces will enable trainees 'within the university CoP to become part of a 'webby nonlinear causality of peers influencing peers'. It is thus argued that teacher educators currently face the challenge of identifying and enhancing existing communities of trainees who would share a common purpose and beliefs in order to learn, participate and

contribute alongside both novices and experienced members (Barab et al., 2003: Buysse et al., 2003: Eisenschmidt, 2006: Kirschner and Lai, 2007).

The internet, electronic mailing, electronic bulletin boards, computer and video conferencing tools have spawned a new learning ecology, a 'connectivist' approach to accelerate communal inquiry and discourse among peers, university tutors, mentors, and collaborators that never lead to an end but forge out to an ongoing process of lifelong learning (Quinton and Houghton, 2005). While Quinton and Houghton (2005) argue that until now educators have grasped just a good insight to the vast possibilities of the technologies as a learning tool, Salmon (2005: 1) contends that Higher Education Institutions 'are still 'flapping' about and not yet 'flying' with new technologies'.

Although video conferencing is actually quite an 'old' technology' relatively speaking, the use of VoIP which is Internet telephony, is considered as part of the panoply of tools now routinely used by people to communicate with one another.

2.3.2 Why Video Conferencing?

'At its simplest, video conferencing is a tool which allows users to see and hear the person they are communicating with' (Arnold et al., 2004: 8). Users can establish video conferencing links locally, nationally or across the world. Video

conferencing comes in a variety of formats, such as dedicated units or computer-based desktop video conferencing (Arnold et al., 2004). Typically, during a video conferencing link the participants book a designated conference room and communicate with another group at a different location via a large screen display (Potter and Roberts, 2007). On the other hand, during a desktop video conferencing link, two or more users in different locations establish live audio and video communication via their desktop or laptop personal computers (Potter and Roberts, 2007). When more than two sites are taking part in a call the link is called multi-point conferencing (Arnold et al., 2004). Comber et al. (2004) underline that the choice of the system depends upon its intended use, the 'fitness for purpose' notion: generally speaking a webcam is suitable for one-to-one communication but is not suitable for group communication. This rules out VoIP technologies such as Skype for many (perhaps most) classroom activities. This suggests the need for high specification systems capable of facilitating communication between large groups in terms of both audio and visual quality.

A number of studies (Husu, 2000: Hearnshaw, 2000: Kinnear et al., 2002: Comber et al., 2004) suggested that for the successful implementation of high quality video conferencing in educational contexts, the performance of the technological tools should not be the only issue to be considered thoroughly, but that other issues including the content, goals, kinds of interactions, group consistency, training and dialogue are equally important. For this, Martin (2005) criticises the New Opportunities Fund programmes in the UK which did not

include training in the use of video conferencing within the range of technologies for professional teachers. She believes that operating the video conferencing equipment is not the real problem, rather the challenge lies in enabling teachers to release their creativity and use video conferencing to enrich learning processes (Martin, 2005).

Cullimore (1999) argues that the immediacy of interaction and communication during video conferences is one of its advantage over other technological mediums as it offers opportunities for better communication. However, as with other media, video conferencing technology creates a psychological and communication space between the learners called transactional distance (Moore, 1997: Husu, 2000). According to Moore (1997) the concept of transaction, which means the interrelation between the learner, the environment, and patterns of behaviour in the situation where the learners and teachers are separated by space and/or by time, affects teaching and learning situations and alters the traditional teacher and learners' roles. Again, where video conferencing differs from other media is that it permits more dialogue and requires less structure, hence is more likely to bridge the transactional distance in contrast to other highly structured programmes and recorded media such as video tapes (Moore, 1997: Heath and Holznagel, 2002).

Moore (1997) argues that video conferencing provides a friendly atmosphere supporting students to develop feelings of pleasure at the interdependence they

develop in video conferencing rather than in less dialogic or traditional forms of teaching. Becta's report (2003: 2) on the use of video conferencing at schools shows that 'students who normally stay in the background participate more; they are motivated to take part in video conferencing'. Similarly, in a number of other studies (Jennings et al., 1997: Nichol and Watson, 2000: Jyrhämä, 2003: Boccia et al., 2002) on the use of video conferencing in teacher education, although trainees reported minor difficulties with the technology they felt more relaxed and secure communicating in a distance.

In fact Boccia, Fontaine and Lucas (2002: 9) reported that 'the psychological distance afforded by the physical separation of master teachers and observers [...] empowered pre-service teachers to ask hard questions that would seem too direct or challenging in face-to-face encounter'. Similarly, the vast majority of the trainees attending an online Master's Module in Wheeler et al.'s (2005: 135) research, reported that the synchronous nature of the video conferencing technologies, which allows immediate interactions in real-time, is favoured 'as means of comparison, debate and collaboration' especially once the factors of anxiety and inexperience of being novice members have been removed. Similarly, Caipingi et al.'s (2010) study showed that classroom evaluation and interaction between experienced teachers and experts in different provinces in China via the means of video conferencing promoted an alternative culture of interaction with less tensions and more objective and well-thought comments. Experts were enabled to conduct interpretations simultaneously released from

the pressurised settings and the demands of a face-to-face communication (Caipingi et al., 2010)

Hence although Cullimore (1999) claims that video conferencing leaves no time for the participants to think and reflect before responding and that the transactional distance can be perceived as an inhibiting factor as there is the potential of misunderstanding between the various inputs of the participants; in the case of the video conferencing, it is more likely to be perceived as an aid to interaction as some people might feel more relaxed and at ease teaching, studying or being observed at a distance (Moore, 1997: Husu, 2000). This is because the transactional distance depending on the extent of the dialogue or nexus of interactions that occurs during the course, the structure of the course and the extent of learners' self-directedness and autonomy (Moore, 1997: Chen and Willits, 1998).

Martin (2005) points out that videoconferencing technology not only bridges the physical and psychological distance between users but thus it enhances the distant learning experience. He continues that 'videoconferencing can be used to cater for a range of intelligences and learning styles' (Martin, 2005: 398). Further the learning can be extended after the video conferencing, since a video recording can become a useful reference resource (Arnold et al., 2004). Videostreaming which allows broadcasting videos 'live' over the internet can also be a useful tool for archiving and retrieving video conferencing recordings

to enable wider beneficial access of the produced materials through the internet (Martin, 2005).

Moreover, what various videoconference vendors are promising today is restoring the 'natural communication' and 'connectedness' between participants via telepresence which creates the illusion of remote participants being all together in the same place (Weinstein and Lichtman, 2005). Explicitly, it is said that traditional video conferencing communication fails to generate the feeling of eye-contact between the participants since the participants' eyes stare at a video display rather than directly into the camera, although over time a number of modifications have promised minimum angle gaze and maximum sense of participants' connectedness (Weinstein and Lichtman, 2005: Waters-Adams et al., 2009). As opposed to traditional video conferences, some of the features of telepresence technologies are high-quality life-size imagery and supported eye gaze (Weinstein and Lichtman, 2005) for creating a social telepresence effect that makes participants disregard the fact that technologies are the mediated means for enabling communication with one another (Hall et al. (1998), cited in Edmondson, 2007).

Where exactly video conferencing technologies can be integrated to assist the process of developing a teaching identity in initial teacher training, is considered in the next section. Understanding the teacher education context and needs of trainees is the first step towards exploring ways to enhance their learning

trajectory or the transformation of identities from trainees to teachers via the video conferencing technology. Hence the following section explores the teacher education context as it is presented in the current literature.

2.3.3 Where Video Conferencing may thrive in Teacher Education

Since 1992 the DCSF (Department for Children, Schools and Families) - now known as Department of Education (DfE) - requires all trainees to spend two thirds of their course 'on the premises of partner schools' for receiving hands-on experiences (DfE cited in Wright and Cordeaux, 1996: Jennings et al., 1997); and just recently the DfE (2010a: 9) places more emphasis on 'building practical skills in initial teacher training'. As a result, initial teacher training providers have been establishing numerous partnerships with various interested schools. Those schools acquire Training School status and are assigned to develop and disseminate good practice in initial teacher training (DfES, 2006: 9). Not surprisingly, the training schools are geographically dispersed (Wright and Cordeaux, 1996). Although the DfE (2010a: 9) seeks to establish 'teacher training schools, which are fully operational, highly effective schools which are part of the faculty of education of universities' in the future, so far a great number of trainees was/and still is departing from their network of colleagues, friends and tutors for the most part of the course during their TEs (Pratt, 2008). Hence, it is reported that trainees feel isolated from each other, their tutors and the teaching resources available at the Higher Education Institutions when they are on TEs (Wright and Cordeaux, 1996). Hixon and

Sanborn (2005: 3) argue that dispersed partnerships is one of the reasons why 'students often do not spend adequate time processing and reflecting on their observations, thereby not gaining as much as they perhaps could (or should) from the experience'; because, although they receive a gamut of different experiences they have limited opportunities to discuss them with their peers and/or tutors. As opposed to this, teacher education programmes emphasise reflective thinking in order that trainees are engaged actively in improving, reflecting and processing their experiences at schools (Hixon and So, 2009).

Pratt (2008) concurs, arguing that the immediacy of opportunity for discussion is a key issue for reflection, alongside the nature of the community within which reflective practice takes place, because trainees need to be afforded the space and camaraderie to share secret 'sacred' stories of their in-classroom experiences. Explicitly, Pratt (2008: 1478) believes that compliance to the highly detailed and structured teacher education system of recording and taking evidence of trainees' activities and achievement encourages trainees 'to juggle the competing demands of both engaging in practice and justifying its success'. Hence, he argues that trainees may devise cover stories to demonstrate their expertise whereas they would have perhaps benefitted from sharing sincere secret stories of their classroom practices with their peers. Pratt (2008) questions whether trainees talk freely about their experiences in front of their university supervisors, although this is not to suggest that such discussions are not valuable since it is recognised that an expert perspective in a discussion is

always valued. However, peer discussion is also important as the DfE (2010a) are now calling for trainees and teachers to learn from one another.

Barab and Duffy (2000: 168) further add that trainees focus more on describing their experiences, achieving just a 'social acculturation' to their profession. On the contrary, according to Edwards and Protheroe (2003), trainees are expected through informed peripheral participation to develop their thinking from the specificity level of the classroom events to the generality level, in order to become capable of interpreting new events in increasingly complex ways for responding to learners' individual needs. To achieve this, trainees need to acquire opportunities to discuss the pedagogical rationale underpinning their practices in abstract terms (Edwards and Protheroe, 2003). This proposition leads to Harrison et al.'s (2005b: 421) argument that novice teachers may begin to understand practices but there are still aspects of the professional landscape that may remain 'hidden' as they are not easily deconstructed by novice teachers without the involvement of expert teachers who will assist bridging the theory and practice.

This is also consistent with the suggestions of Sim (2006) and Hung and Tan-Seng (2004) who argue that trainees should not only draw on the expertise and knowledge of their university tutors, but that local mentors and experienced teachers may enable the theoretical and practical knowledge to be fruitfully joined. Barab et al. (2002: 511) encapsulate this in his phrase 'one becomes a

teacher primarily through teaching, through reflection on teaching, and through participation in the dialogue and community-building that occurs during the on-campus seminar – not through being exposed to abstracted facts in a college classroom’. Specifically in a research case in Lehman and Richardsdson’s (2007) study, university tutors advocate that integrating live video conferencing in order for teachers to model strategies for trainees, not only allows connections with the real world to be drawn, but lends credibility to the strategies rather than merely talking about them.

As outlined in this section, it was towards resolving some of the above limitations - dispersed partnerships, lack of peer interaction during TE, the breach between knowledge learned at the university and in the workplace - that video conferencing technologies were employed to supplement field experiences and support on-campus training and predominately to enhance reflectivity. Explicitly, video conferencing has been employed in many cases to facilitate the creation of virtual CoP within which the teachers reflect on, share, and improve their pedagogical practices (Coyle et al., 2006; Barab et al., 2003). In another case, Pratt (2008) advocates using multi-point videoconferencing to enrich reflective practices, and shooting and editing video segments of trainees’ own classroom practices, to enhance discussion, an idea that was originated by Sharpe et al. (2003) in a Singaporean context and was replicated later on in an English context to produce comparative results. It was envisaged that these video conferencing links in combination with producing video segments of their

own teaching practices may well substitute some aspects of trainees' work including weekly reflective reviews or lesson evaluations (Pratt, 2008).

According to Kent (2007: 51), 'though there is never a simple solution, improving teacher quality must begin with teacher education programs' and she argues that 'interactive video conferencing is a powerful tool that teacher education programs can utilise to help prepare new teachers to meet the many challenges inherent with education students today'. Explicating further the context of teacher education through the lenses of CoP framework may bring a better understanding of where the value of video conferencing may lie.

2.3.4 Video Conferencing in Teacher Education

Since the focus of this thesis is on video conferencing tools, the following section examines the existing empirical evidence on the use of video conferencing as a professional tool for enhancing learning communities in teacher education revealing where it may work, and where it may fail. 'While videoconferencing is familiar in the media, in news and various television venues, as well as in business community, its role in education is still being defined' (Plonczak, 2010: 242).

2.3.4.1 Video tutoring and distributed professional learning communities

Video conferencing has been used to enable trainees to video tutor, that is to supervise pupils at a distance and for university tutors and experienced teachers to video tutor trainees at a distance in one-to-one basis or even in a group situation. A number of such cases are discussed here. Even back in 1999 a partnership programme at the University of Brighton in secondary school-based training was introduced to enhance mentorship via video conferencing and other technologies for the trainees on TEs (Cullimore, 1999).

Bryde's (2001) research found no significant difference between the trainees' attitudes and perceived outcomes towards online tutoring and face-to-face tutoring with K-12 pupils; because both types of tutoring were comfortable enough in establishing strong relationships with pupils and helping them in areas of need. In another study by Johnson et al. (2006) trainees not only tutored pupils at a distance via video conferencing but also they received mentoring from experienced teachers and university tutors in a form of co-teaching. These 'Cybermentoring projects offered a way in which [trainees] can be challenged to consider their beliefs and values about teaching' modelling high level collaborative learning ethics between practising teachers and university members towards inquiry and reflective practices (Johnson et al., 2006: 61). In both studies (Johnson et al., 2006: Bryde, 2001), trainees reported

that online video tutoring increased their levels of self-esteem in teaching. In addition the highlight of online video tutoring was their pupils' expression of gratification through the use of the shared interactive board for sending messages of thanks (Bryde, 2001) and the facial expressions, non verbal communication and body language was a useful aid via video conferencing interaction (Johnson et al., 2006).

In other cases, university tutors supervising trainees at a distance via video conference, in a Finnish research study reported in Jyrhämä's (2003) paper, was found similar to a real situation where a supervisor is sitting in the back of the classroom. In fact, Jennings et al.'s (1997) research reported that online supervision sessions afford the opportunity for trainees and university tutors to make use of a number of facilities including temporarily highlighting shared data on screen and internet resources, immediately after the live observation, stimulating a more intensive and detailed study of evidence for improving trainees' learning. Specifically, it was found that the cognitive demands during video tutoring were higher than in a face-to-face situation because the physical separation between the participants forced them to pay more attention, be professionally prepared and provide more thoughtful explanations and precise arguments (Jennings et al., 1997). Potter and Roberts (2007: 2) similarly argue that individual or small group tutorials with trainees provided opportunities for more 'student-focused approach tutorials' for addressing individual needs from the comfort of their homes rather than wasting time and energy for travelling. O'Connor (2007) also indicate that supervising trainees on TEs across different

settings and in different disciplines in teachers either for eliminating distance or providing focused immediate feedback has been proved effective.

In particular, video tutoring trainees on TEs in a group situation, as opposed to the tutor's on-site school visits, allowed greater contact time and communication between peers and with their tutor, promoting in this way learning communities (Sharpe et al., 2003). A number of authors (Sharpe et al., 2003: Wright and Cordeaux, 1996: Potter and Roberts, 2007: BECTA (British Educational Communications and Technology Agency), 2003) agree that in this way video conferencing contributes in diminishing trainees' feelings of isolation. Especially, Wright and Cordeaux's (1996: 200) research suggests that the video element of video conferencing is useful for providing human contact and reassurance among the trainees, however once the work begins 'satisfaction comes in the completion of the shared task'.

Nolan and Exner (2009) recognised the value of participating in collaborative mathematics education CoPs with peers and tutors supported by video conferencing as opposed to one-to-one 'virtual tutoring' between a trainee and a tutor focusing on individual trainees' school experiences. Although the 'attempts' in Nolan and Exner's (2009) research for secondary mathematics trainees in U.S fell short of sustaining ongoing, synchronous dialogue during TEs due to technical difficulties, a strong potential of such learning environment to enhance theory and practice transitions and continuum between university

and school experiences has been recognised. A similar research study was conducted in a Singaporean context with much more positive results which was reported in Sharpe et al. (2003), Hu et al. (2001) and Crawford et al. (2002) claim that is well known in the field of video conferencing in initial teacher training. In this study video conferencing was not only used to replace the traditional supervision session between a university tutor and a trainee but to enhance reflective practice in the presence of a university tutor and within their distributed peer community. This study combined multi-point video conferencing along with digital cameras to enhance trainees' learning. Specifically, trainees were encouraged to share three minutes' footage of their own teaching practice and reflect on them at times when the experience was of most value to them (Hu et al., 2002: Sharpe et al., 2003). Overall, peer discussion, tutor moderation, receiving feedback, sharing professional experiences and knowledge on predefined pedagogical agenda within meaningful contexts as well as learning to use new technologies, contributed to developing trainees' professional identities and cooperative and reflective skills (Sharpe et al., 2003).

However, some trainees argued that the limited time of three minutes of recording their teaching practice only resulted in producing an artificial example on which they could not make decisions about their overall teaching practice (Sharpe et al., 2003). Further, at times when there was no synchronisation between the verbal and non verbal communication of a speaker, participants' concentration and collaborative efforts were disrupted (Sharpe et al., 2003). In

spite of these predominately practical limitations, Sharpe et al. (2003) reported positive outcomes in providing opportunities for sharing problems, generating solutions, seeing different ideas for teaching a topic, exchanging lesson materials, and enhanced links between the course and school-based learning. Interestingly, trainees in Hu et al.'s (2001: 5) study reported 'it makes it easier to bring up issues because you feel a safety in distance'. Explicitly, they reported that the informal nature of the video conferencing as opposed to the formally arranged supervision sessions made them feeling comfortable in sharing problems, brainstorming and finding solutions (Hu et al., 2001: Hu et al., 2002).

Since video conferencing has been employed in various venues in teacher education, different uses are reported here for example for developing trainees' subject knowledge.

2.3.4.2 Video conferencing for developing trainees' subject knowledge

While Charnitaki and Harvey (2000) provide evidence that video conferencing can enhance trainees' subject knowledge construction in science when studying with fellow students at a distance through immediate interactions, high level thinking and peer scaffolding; Coyle (2004) found that trainees enhance

their knowledge construction in science and foreign languages lessons alongside young pupils in real life classrooms through virtual social interaction. Edmondson's (2005) doctoral study shows a tenuous link between trainees' participation in online collaboration through cognitive apprenticeship facilitated by telepresence technologies with achievement of higher scores on content assignments, compared with the group of trainees attending face-to-face traditional training. Specifically, Edmondson's (2005) quasi-experimental research study shows evidence that teachers who experienced live modelling of instructional strategies in mathematics by an expert consultant via telepresence in their own classroom settings and were provided with guidance until they felt confident to proceed on their own, enacted high levels of pedagogy. Thus their pupils achieved higher mastery in mathematics' content compared to the control group whose teachers attended the traditional face-to-face workshops (Edmondson, 2007).

Similarly, Wilkerson and Rogers's (2003) report on the 'C-cubed project', C3, standing for content, collaboration and connectivity, via video conferencing between university mathematic faculties, teacher preparation programs, school mathematics teachers and technology personnel, demonstrated both trainees' and classroom pupils' reinforcement of mathematic content knowledge. The project involved accessibility to external resources including experts, field experiences and use of multimedia to enhance modelling of instructional material, understanding algebra and other mathematical concepts (Wilkerson and Rogers, 2003).

In another case targeting development of trainees' content knowledge, Plonczak's (2010) research study explored the use of videoconferencing as a tool for enabling trainees in an undergraduate primary education programme to acquire hands-on experience in schools by teaching fifteen minute mini lessons at a distance. The findings of the research show that the distance afforded by the technology between trainees and pupils enable the former to realise that they need to develop their questioning skills in maths and science lessons to acquire excellent content knowledge in order to be capable of promoting an inquiry-based environment conducive to learning in which their pupils would be encouraged to pose questions (Plonczak, 2010). However, trainees indicated that video conferencing limited their opportunity to explore pupils' conceptual understandings prior to the lesson (Plonczak, 2010). Furthermore, the trainees had the opportunity to observe inquiry-based modelled video conferencing lessons delivered directly by the university science course professor to children at schools and have a collective follow-up discussion and reflection (Plonczak, 2010). Pupils at schools enjoyed the experience and provided 'opportunity for in-depth investigation of science phenomena' (Plonczak, 2010: 251).

As Hixon and So (2009) argue, receiving vicarious experiences with video conferencing in teacher education promotes reflectivity as claimed above, and exposure to various teaching and learning environments that will be discussed in the next sub-section.

2.3.4.3 Video conferencing for remote observations and nourishing learning communities among trainees, university tutors, teachers and pupils

Research evidence shows that video conferences could replace a number of trainees' actual visits at schools in a flexible and cost-effective way, providing additional benefits (Lehman and Richardson, 2004). Explicitly video conferencing can be used for implementing live lesson observations in a variety of schools - technologically rich, rural, ethnically or socio-economically diverse. Beyerbach, Walsh and Vannatta (2001) revealed evidence that video conferencing (along with other technologies including emails, listserv, which was the first software application that allowed sending one email to reach a list of people automatically) enabled a group of trainees by live classroom observation to acquire experiences on how experienced teachers were using new technologies in the specific context of special education and science. Kinnear, McWilliams, and Caul (2002) reported that video conferencing was an effective virtual substitute of real observations in 'composite', co-educational classes in small, rural primary schools. Similarly, Boccia et al. (2002) stated that trainees observing via video conferencing master students teaching in a range of schools from urban, suburban, middle, secondary to technical schools, were enabled to reflect on and debrief about actual teaching experiences and engage into pedagogical discourses.

Furthermore, in Lehman and Richardson's (2004) study eighty-three percent of trainees responded via online surveys that the use of video conferencing along with other technologies including email and web, enabled them to acquire hands-on experiences with ethnically and socio-economically diverse and multicultural classrooms. It was highlighted that the experience provided them with grounded understandings of pupils' learning diversity which is the first substantial step towards learning to teach culturally diverse classrooms (Lehman and Richardson, 2007). Secondly it enabled them to develop technological skills which is the first step towards using the technology critically in their own future classrooms (Lehman and Richardson, 2007). Either shorter-term distant classroom observations or longer-term virtual visits for supporting trainees from campus working actively with children at schools video conferencing was regarded as a productivity tool for teaching and learning, communication, and reflection on teaching (Lehman and Richardson, 2007). Although a number of teachers at school perceived the experiences as more beneficial for trainees rather than their own classroom, others stated that children who never heard of anyone close to them going to college had benefitted from their weekly interactions with their university friends (Lehman and Richardson, 2007).

In another case, a Southeastern university in the US invested in interactive video conference technologies in order that their trainees enrolled in an undergraduate reading methods course could be provided with a series of authentic lessons and debriefing sessions with a teacher thought to exemplify

excellence in reading instruction (Kent, 2007). Some of the raw data presented in Kent's study (2007: 55) was that 'it gave me the opportunity to see a lesson from the beginning to the end. It was a great model for me to do my lessons by'. On the whole, the vast majority of ninety-one percent of trainees reported internalising, emulating and developing techniques for adapting learning to the pupils' specific needs through (Kent, 2007).

Three more cases from the UK, Australia and U.S respectively reported that observing on campus live lessons, interacting with the teachers and subsequently analysing an authentic session with peers, tutors, teachers and children provides a more comprehensive and in depth questioning and conversation than that which may occur in one-by-one situation with a teacher by the end of an observation in schools (Haldane, 2005: Millwater, 2002: Scordias and Morris, 2005). Live lessons transmitted from school classrooms to lecture theatres via video conferencing, in contrast to the traditional observations, can be observed in a group situation which is preferable because it 'offers more opportunities to pick up salient points that a single observer could easily overlook' (Haldane, 2005: 7) and hence hold meaningful discussions on shared experiences (Hixon and So, 2009). Further in Haldane's (2005) project which aimed to enhance trainees' learning on using interactive whiteboard technologies, the trainees valued the live question and answer interaction slot with the experienced teacher because it provided them with insights into the teacher's own review of the lesson.

Further, 'viewing sessions in real-time as opposed to recordings is preferred because live sessions, with the element of risk that things can go wrong have a feeling of immediacy and reality that contribute to the 'situated learning' aspect of the experience' (Haldane, 2005: 7). Millwater (2005: 12) argue that 'video conferencing has great potential in demonstrating to [trainees] that the theory/practice relationship is one of "embeddedness"' which means that theory is embedded in practice and that video conferencing can enable examination of any pedagogical assumptions in current practices. According to Comber (2011: 19) video conferencing contributes to the situated element of learning because the observer can never 'stop the action' while the lesson progresses, led by experienced teachers; therefore s/he is able to observe the realities of a classroom with the interruptions, dilemmas, efforts, inconvenience or accomplishment of the pupils and the teacher. There is also the element of spontaneity and authenticity observed during a live lesson as well as the non-obtrusive aspect of this type of observation in a distance (Millwater, 2005).

In particular, Millwater's (2005) Virtual Workplace project for trainees and experienced teachers mediated by the use of video conferencing and web-based technologies in a first-year teacher education programme, showed mutually beneficial outcomes in both 'experienced and neophyte teachers' development of identities and school and university's pedagogies related to pupils/teacher interactions, behaviour management and practice teaching. Such interactions appeared to precipitate transitions in pre-service and in-service learning since trainees had the opportunity to analyse live lessons and hear the

teacher's reflections on how things went, making in this way 'the covert teacher thinking, overt' (Millwater, 2002: 5). Thus teachers also 'developed their identities as professional practitioners' through reflection and by fulfilling their new roles as 'presenters' sharing the 'teacher thinking' and process of teaching (Millwater, 2002: 5). There was also the opportunity to understand and build on their ability to engage in constructive teacher thinking through the expert facilitation of university tutors in following tutorials related to the Virtual Workplace (Millwater, 2005). Although the effect of the Virtual Workplace on trainees' knowledge construction is not a measurable outcome, it was found that their group discussions after the observations became more focused on pedagogical issues and more confident in the language, practices and expectations of the workplace (Millwater, 2005). Furthermore, both Millwater (2002) and Lehman and Richardson's (2004) research showed development of trainees' observation skills during video conferencing under the guidance of university tutors.

Overall, Hixon and So (2009) argue that video conferencing implementation is more advantageous for specific purposes. For example, it is useful if its focus is to gain exposure to a diverse classroom settings, build upon a shared experience with peers and university tutor, engage in review events repetitively assuming that it is video recorded, and draw together conceptual and theoretical knowledge. However, for conducting personal relationships and interactions with pupils and teachers they are preferably developed in traditional TEs (Hixon and So, 2009). O'Connor et al. (2007) identify the video

conferencing uses to supervise, to observe and to diversify, that is to expand opportunities for observing, interacting with and teaching diverse pupil populations.

In spite of the numerous optimistic and encouraging results of integration of video conferencing technologies in teacher education, it may provoke some critiques by a number of participants or it may cause a number of dilemmas for those who would like to integrate it meaningfully to their practices. Some of these issues are considered in the following section.

2.3.5 Video conferencing ‘critiques’

The critiques on the use of video conferencing technologies in teacher education are categorised as technological, personal/social and pedagogical. In fact, some technological imperfection including disruptive background noise, and a number of obstacles in the process of reconfiguration of the schools’ Internet Firewall are echoed in Lehman and Richardson’s research (2007). Similarly, Pratt’s (2008) research reveal that the regional broadband provider for schools in UK prevented easy access and downloading of video conferencing software to the schools’ computers especially those accessible by children, hence it took several weeks before video conferences were set up from schools’ sites. A number of other hardware and software problems faced by trainees who were set to implement their virtual meeting with colleagues

from their schools' sites were reported by Waters-Adams et al. (2009). Although a number of technological imperfections were reported in the literature it is recognised that it is important that those are set to minimum because as teachers in Edmondson's (2007) study highlighted, the important thing when employing technologies is not to be obtrusive. The quality and reliability of video conferencing has improved in recent years, hence it is gaining increased use in teacher education (O'Connor et al., 2007).

Other reported critiques relate to some personal/social issues of the participants. Explicitly, from the perspective of teachers at schools in Millwater's (2005: 3) research, those who had no prior experience of being observed at a distance reported that virtual visits at schools made them feel uncomfortable because of 'working in an environment in which all of their actions and decisions are much more open to scrutiny and analysis from outside'. Also, some trainees felt 'there were TVs between us' illustrating aptly the psychological distance afforded in video conferencing links and the lack of personal presence restricted any opportunities for them to develop personal relationships with the children (Lehman and Richardson, 2007: 13). A related finding by Edmondson (2007) was that the video conferencing situation is still lacking compared with face-to-face interaction since the physicality associated with walking around in a class and getting a real sense of that environment is irreplaceable. This could be also associated with the pedagogical/learning outcomes of the video conferences because as reported in Lehman and

Richardson's (2004) study, a number of trainees felt cheated by the virtual experiences as they could not gain a feeling of the school's culture.

Some other rather personal critiques on the video conferencing used for trainees' online cooperation whilst on TE were found in Waters-Adams et al. (2009). In fact, a number of trainees argued that there were issues 'just too raw and sensitive to be aired comfortably in a video conference' which is an impersonal, cold medium (Waters-Adams et al., 2009: 8). Specifically, the research project aimed to explore the use of video conferencing for enhancing trainees' reflective dialogue during TE. However participants neither found the idea stimulating nor useful during their already stressful and busy time at TEs (Waters-Adams et al., 2009). In fact, trainees reported that 'just because we have been placed in neighbouring schools [with colleagues it] does not mean that we have common professional concerns as priorities for discussion' (Waters-Adams et al., 2009: 7). Pratt (2008: 1479) comments that it takes 'deep changes to pedagogy' in order that the potential of the new technologies to be realised.

The question arises, therefore, as to whether videoconferencing remains a viable means for promoting distributed learning communities in teacher education and if it does, which preconditions enhance video conferencing experiences? The following sections identify the professional context,

contextual factors and personal relationships influencing the uptake of the technologies.

2.3.6 Professional context influencing the uptake of the technologies

Pratt (2008) argues that using technology bolted on existing traditional practices only results in replicating some of the same. Henderson (2007) agrees that using the technologies including video conferencing for supervision purposes in order to fulfil institutional requirements to demonstrate trainees' professional development, instead of investing time in sustaining long relationships among core and peripheral members, will only result in retaining traditional practices. Hence, the emerging question when employing a technological tool should not be whether the specific technological tool improves practices or not, but in what ways, how, where and why it improves practice (Pratt, 2008). Consistently the present research explores the various ways in which video conferencing can support innovative ways of teaching and learning within CoP. Similarly, Coughlin and Kajder (2009) advocate that although it is difficult to measure effective working through collaborative communities, sharing examples of good practice, posting samples of pupils work either online or offline, and overall any evidence of change in pedagogy, determine 'success' in teachers' professional learning.

Along similar lines, Moore and Barab (2002: 48) found that ‘utilizing an ‘old-school’ notion of [instructional] professional development to promote this new model’ of community of critical friends is not viable. Explicitly, evidence from the same research related to an Inquiry Learning Forum, a web-based community to support maths and science teachers’ professional development, reported also in Baek and Barab’s (2005) paper, did not encourage thought-provoking questions, feedback, reflections and analysis due to the culture of the teaching profession discussed earlier in this literature review. In summary, teachers needed ‘ready-to-use’ resources to fulfil their immediate curricular needs, their time was restricted due to their busy schedule and further, neither teachers nor trainees were used to engage in critical dialogue in their professional lives. Interestingly, the study suggested that small private communities of trainees led them to move from congeniality to collegiality (Baek and Barab, 2005). Congeniality is the condition of getting along with colleagues and enjoying each other’s company whereas the collegiality involves conditions of energetic professionalism, learning and trust since colleagues engage in problem-solving issues, sharing with and teaching each other what they know, visiting each other’s classrooms, working together on planning and researching practices and the curriculum (Beck and Kosnik, 2001).

2.3.7 Contextual factors influencing the uptake of the technologies

Teaching practices are inherently influenced by socio-cultural dimensions and educational goals but in addition there are pragmatic reasons and contextual

factors including the degree of technical expertise, support and confidence that could also 'affect the uptake of ICT' (Pratt, 2008: 1478).

Pratt (2008) argues that there are a number of issues that need to be addressed at least in the UK to promote new technologies especially multi-point video conferencing between schools and universities. He argues that there are a number of ethical issues in English schools and universities precluding a distributed communities model amongst trainees who are on TEs which are not revealed at least in the Singaporean context (Pratt, 2008). Specifically, Pratt (2008) notes that local authorities and schools in the UK have developed policies on taking video recordings of children and hence compliance with these policies and the university's ethical guidelines, seeking written parental permissions is required in any case before proceeding with video filming pupils. Similar issues of taking time and putting effort for ensuring minors' protection are reported in Moore and Barab's (2002) study underlining that parental permissions were taken before the free exposure of classroom segments to the web.

Another important issue reported was that the limited length of TEs and the hectic schedule of teachers and tutors that led to limited communication, difficulties in arranging online meetings, allocating time, negotiating focus themes and communicating unexpected changes (Pratt, 2008). Hence a number of researchers suggested more flexibility in terms of timetables for

providing time for interactions, setting explicit objectives and building a rapport between the participants prior the video conferencing for overcoming initial shyness and establishing a communication culture (Millwater, 2005: Kinnear et al., 2002: Boccia et al., 2002).

Ertl et al. (2006) and Ertl et al. (2005) investigating support methods suitable for group collaboration in video conferencing situations reveal that learners' construction of knowledge and the ability of learners to elaborate on and comprehensibly explicate knowledge to a colleague could be supported by shared on-screen applications. The learners who during their group work via video conference were provided with a combination of support mechanisms: a visualised content scheme which helped them to organise and focus on the subject matter and a collaboration script of the sub-tasks and roles of the learners, were found to have a better collaboration outcomes in group product (Ertl et al., 2005). Explicitly, the technological functions of an online interface, the synchronous nature of video conferencing, the immediacy of communication and the similarity it conveys with face-to-face interaction affects the degree of trainees' engagement in discourses and facilitates constructive analysis of teaching practices (Wheeler et al., 2005: Barab et al., 2003). The next section argues that members' relationships, emergent issues, immediate needs and the overall learning landscape play the ultimate role in the learning outcomes within CoP (Pratt, 2008).

2.3.8 Human relationships influencing the uptake of the technologies

As already mentioned, technology offers the potential for trainees to have access at point of need with a wider community of learners (Pratt, 2008: Moore and Chae, 2007). However it should be noted that technology itself does not guarantee learning, rather it supports learning. In fact, Hawkes and Romiszowski (2001) suggest that technology provides convenient contact with colleagues but the learning result produced depends on the learners.

Specifically, flexibility in arranging meetings and a friendly online interface are conditions for supporting a healthy functioning community, in which members will share objectives, circulate useful information and cultivate a secure atmosphere of trust (Hernandes and Fresneda, 2003: Henderson, 2007: Henderson, 2006: Wenger and Snyder, 2000). Such an environment of mutual support, socialisation, reciprocity and sharing, enhance opportunities for trainees to engage in critical reflection of their own practices (Squire and Johnson, 2000: Barab et al., 2003: Hernandez and Fresneda, 2003: Hawkes and Romiszowski, 2001). Hawkes and Romiszowski's (2001) research findings reveal that self-disclosure reduces teachers' reflective contributions whereas a respectful climate of acceptance among the members encourage expressive and self-revealing contributions. Similarly, Chapman et al. (2005: 218) drew a dividing line between an online conversation within a learning community and a

mere information-exchanging relationship since the former reveals elements of 'informality, familiarity, honesty, openness, heart, passion, dialogue, rapport, empathy, trust, authenticity, disclosure, humour and diverse opinions'. In fact, Chapman et al.'s (2005) research found connections between strong community links and deep learning in an online asynchronous professional forum for Heads, since the collaborative environment that the participants were exposed to encouraged them to be more metacognitive contributors.

Ownership and taking responsibility for developing and maintaining their network is important (Kim, 2001). Mutuality and sustained participation in activities that matter to trainees or teachers provide avenues for renegotiating practices and identities (Henderson, 2007: Barab et al., 2003). Thus, the community's knowledge domain is valued by members. For example trainees, at various levels of their professional development, acquired different needs which might be specific: material to cover their immediate needs related to local context, or to promote local practice to obtain global meaning (Hernandes and Fresneda, 2003).

Furthermore it has been documented that face-to-face interactions play an important role in the development of a virtual community for enhancing and facilitating participation, motivation and building community cohesion and therefore, online communities introduced as extensions of face-to-face activities met greater success because the technological medium sustained the social

relationships and interaction generated outside the online settings (Squire and Johnson, 2000: Barab et al., 2003: Hildreth et al., 2000: Stuckey et al., 2001).

2.4 Conclusion

It is clear from the synthesis of research evidence presented here that the teacher education paradigm today requires 'learning by teaching, learning by doing and learning by collaborating' (Squire and Johnson, 2000: 26). Theoretically, a socio-cultural conception of learning within CoP has been the focus in teacher education research, a notion that has been predominately found in the work of Jean Lave (1991) and Etienne Wenger (1998b). The locus of this conception of learning is that it would seem unfortunate to design opportunities for trainees to acquire new knowledge and develop an understanding of good teaching practice without being actively involved in and attached to the community's culture. After all, 'good practice...can never be singular, fixed or absolute, a specification handed down or imposed from above...[it] is plural, provisional and dynamic' (Alexander cited in Husu, 2000: 258); it is everything that workers need to perform their job effectively and 'keep themselves satisfied when working together and in this sense they constitute a CoP' (Wenger, 1998b: 47). Therefore, communities of teachers or prospective teachers should engage in questioning even the most embedded and reified techniques, practices and processes of teaching and learning in order to learn to 'struggle collectively.. a process that rarely is aimed at, or ends in, conclusions' (Wenger, 1998b: 95).

This thesis draws upon three key domains of the existing literature suggesting that the technologies and communities may enhance and empower the trainees' learning environment. The basic goal of this thesis is to contribute to the existing research on 'how CoP can play a role in educating teachers of the future and supporting teachers of today' (Kirschner and Lai, 2007: 128). A number of researchers argue that there are still unexplored parameters of the dynamics of educational CoP (Gómez and Rico, 2007: Kirschner and Lai, 2007). Hence, empirical evidence to elucidate information on the CoP's learning contexts, and the nexus of dynamic relationships and interactions that occur in these contexts within the field of teacher education and within other professional disciplines involving learning on TE, is essential (Fisher et al., 2007: Gómez and Rico, 2007: Evans, 2002: Walkington and Vanderheide, 2008).

Moreover, Pratt (2008) pointed out that the issue of transformation of teacher education lies in integrating technologies and promoting 'alternative means of reflection' within CoPs. 'Strong preparation, mentoring and professional development, as well as collaborative learning and planning time in schools, are the building blocks of any successful reform' is the response of the National Education Association in U.S to the economic crisis (Lemke, 2009: 4).

The following chapter opens with the epistemology and methodological decisions taken in this research study addressing thoroughly issues of

justification of the research design, alternative options, methods employed and developed analytical framework.

3 Methodology

3.1 Introduction to the research study

According to the literature review, a socio-cultural conception of learning within teacher education settings tends towards the existence of a complex CoP made of experienced teachers who assist newcomers like trainees to be accommodated in the cultural settings of the teaching profession through successive forms of participation. Trainees' pedagogical transformation is also facilitated within their university peer CoP for resolving any pedagogical tensions, exploring and experimenting with alternative methods, ideas and strategies of teaching and learning. From this perspective, becoming a teacher within a PGCE programme in Primary Education entails engaging within a peer CoP while gradually moving towards full participation in the community of experienced teachers.

However, for practical reasons, teacher education courses involve two broad elements: requiring trainees to either attend taught sessions at the university, or to be posted at schools for acquiring on-site TE. Efforts are made to link together effectively the experience and knowledge constructed at schools and at the universities. This study proposed using video conferencing technologies as a medium for enhancing further the overlapping phases of trainees' experience.

Along these lines, multi-point video conferences were offered, as shown in Figure 3.1, to enable trainees to sustain and expand peer CoP when posted in dispersed partnership schools. Specifically, a number of one hour weekly online video conferencing meetings, during the evenings were planned for the trainees to join at their own convenience and communicate with one another, from the comfort of their homes, by using their own personal computers throughout the three blocks of their TE.

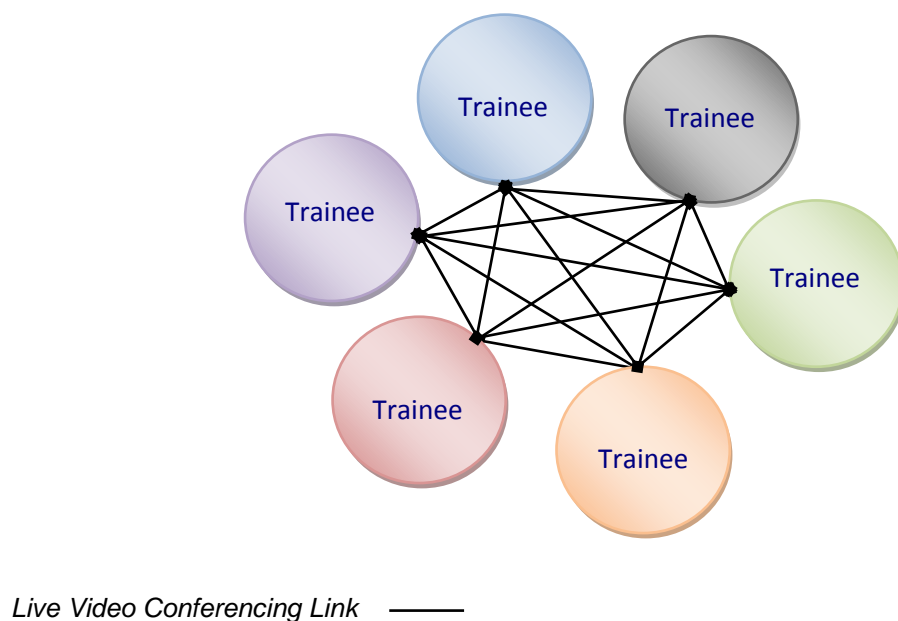
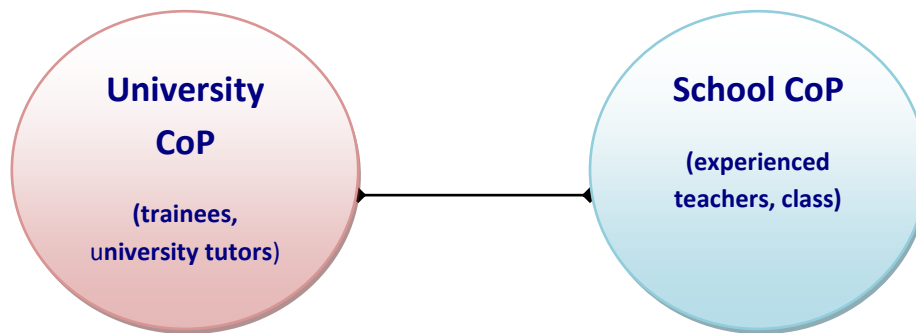


Figure 3.1: Multi-point video conferencing between trainees whilst on TEs

As a result, video conferencing technologies were employed primarily for pedagogical purposes to support the process of ‘becoming a teacher’. They were also found to be a useful medium for data collection. This means that the recordings of the video conferencing sessions among trainees revealed evidence of the process by which trainees move forward and back between the two CoPs and shed light on the overlapping element of the two CoPs where the

trainees 'lived' for the most part of the course. This was followed by an in-depth investigation of whether video conferencing technologies can support trainees emotionally, pedagogically or practically to achieve their common purpose to become teachers. This is consistent with Markham's point of view (2004: 97) on the use of the internet as a medium for reaching distant participants but further as 'a context of social construction' which could provide a milieu for the researchers to explore, witness and interpret the 'negotiation of meaning and identity, the development of relationships and communities, and the construction of social structures as these occur discursively'. Markham (2004) argues that a researcher can study the space itself, the interactions and relationships developed and the communities formed within this structure. This research exploited the internet both as a basis for understanding trainees' community dynamics supported by video conferencing, and as a tool for peer communication at times of need when on dispersed TEs.

Furthermore, video conferencing was integrated in the course as a means of providing a live connection between the university and schools in UK – as illustrated graphically in Figure 3.2. It was hoped to provide opportunities for remote classroom observations and the transmission of authentic school experiences directly at the heart of the university CoP. Trainees were provided with opportunities to make real-time observations whilst being in a group situation with colleagues and university tutors, and to engage in analysing and discussing authentic teaching practices within their university community.



Live Video Conferencing Link ———

Figure 3.2: Video conferencing links between a group of trainees and university tutors located at the university and a ‘live’ class in a primary school in UK

3.2 Research questions

Specifically, this research sought to provide a detailed analysis of the following key questions:

In the context of a PGCE Primary training programme;

1. How do the trainees experience their identity transformation from students to trainee teachers to teachers throughout the course?
2. What is the value of peer communication sustained via video conferencing for enhancing this process throughout the PGCE course and especially, during TEs?
3. What is the value of using video conferencing for connecting university with school communities for the training of primary trainees?

4. How does video conferencing support the overlapping element of trainees' experience at the university and schools?

The research questions in this qualitative case study were not standardised from the beginning, rather they were developed and refined based on the existing literature and from emerging issues during the formative stages of the study (Stake, 2005). Explicitly, the literature presents evidence to support video-tutoring of trainees at a distance (Hu et al., 2002: Hung and Tan-Seng, 2004: Sharpe et al., 2003: Pratt, 2008) and for connecting the 'live' university campus with school classrooms (Lehman and Richardson, 2007: Kent, 2007: Millwater, 2005: Cullimore, 1999: Haldane, 2005: Kinnear et al., 2002: Teaching and Learning Observatory, 2004: Plonczak, 2010) but there is no detailed reference on the value of video conferencing in sustaining CoPs. Further, there is research evidence (Sutherland et al., 2005: Fisher et al., 2007: Sim, 2006) providing a framework of how trainees evolve their identities within CoPs, but there is no detailed reference to what a video conferencing tool could offer, if anything, towards the transformation of trainees' identity to teachers. Hence, a case study method is employed in this study in order to investigate the trainees' pedagogical and identity transformation and whether video conferencing is a pedagogically useful tool in a primary PGCE course according to the subjective perceptions of the trainees and university tutors.

In particular, the first and fourth research questions were refined and 'reformulated in the course of fieldwork' to match the facets of the empirical

case (Miles and Huberman, 1994: 22). Explicitly, once the initial analysis revealed trainees' identity-construction over the time and participation in two overlapping communities, the questions were reformulated to produce first-hand understanding of the dynamics of the two overlapping CoPs and the role of the video conferencing in supporting this overlapping element of teacher education. In fact, the fourth question draws together all the others in a coherent whole –bringing together CoPs and video conferencing.

Hence, the gradual transformation of identities throughout the nine months' course is central to this study. Exploring one's identity entails revealing evidence of one's own views of oneself, of how significant others and colleagues perceive one's self, and by official markers of transition which are provided by the university and the schools. The learning trajectories, the legitimate peripheral participation activities, the feelings and emotional status involved in the process of becoming a teacher, along with the struggles and successes encountered, were some of the main themes for analysing the raw data. The nexus of various relationships developed within the course, including peer relationships, mentor-mentee relationships and university tutors' and trainees' relationships became a fundamental element in understanding aspects of identity construction and levels of participation in a CoP. According to Wenger (1998b) moving from one CoP to another is one of the most significant challenges faced by learners. Video conferencing was employed to explore its potential in supporting this process as part of trainees' learning and also in enhancing the university-school partnerships.

Reflection on the research implementation progress which was extended from the beginning to the end of the course in 2008/2009 offered a springboard for understanding and continuously improving the research process. Hence social-interaction theory led this research study process since the constant communication of the investigator with the users, university tutors and trainees influenced the decisions and pragmatics of the research design in accommodating any existing needs and requests (Yin, 2006: 21). The particularity of the specific case of integrating video conferences in a Primary PGCE course in a large University in the UK Midlands, and its various embedded sub-cases: video conference events with schools and meetings with trainees within the holistic case of a specific primary PGCE course (see Appendix A) affected the methodological decisions, techniques and procedures to suit the specificity of the setting (Miles and Huberman, 1994: Kemmis, 1980). This means that there are no canonical, sterilised rules or standard methodology in conducting social research but that research is a 'craft' (Miles and Huberman, 1994: 5). This is also consistent with Kemmis' (1980: 119) viewpoint that 'case study consists in the imagination of the case and the invention of the study' because there is not an inert object in the form of a universal truth to be captured by sophisticated and fixed research techniques which is what the positivism approach contends.

3.3 Rationale for the research design

According to Miles and Huberman (1994: 2), 'there is no single interpretive truth' rather there are 'multiple interpretive communities, each with its own criteria for evaluating interpretation'. Along similar lines, Guba and Lincoln (2005: 197) argue that the concept of 'reality' cannot acquire one single, absolute representation and thus the validity of a research study relies on the 'meaning-making/ sense making/ attributional activities' of groups of individuals who attribute meaning to social phenomena and pursue their everyday actions based on what is considered as valuable, real and useful in their community-axiology. As a result, the concept of reality is shifting, guiding 'inquiry in quite different ways' (Lincoln and Guba, 1985: 15). Interestingly, Guba and Lincoln (2005: 197) argue that even 'the boundaries between the paradigms are shifting'; including positivism, postpositivism, constructivism, ethnomethodology and interpretivism, since practitioners explore new ways of approaching, understanding, writing and arguing (Denzin and Lincoln, 2005: Silverman, 2004). Such projections of how meaning is attributed in the real world within socially dynamic groups of people resemble the dynamics of the CoPs. In these, members renegotiate ways in which to pursue their valuable enterprises within their own communities. Their communities have a history of practice and a repertoire of perspectives and resources that enable them to attribute meaning to their experiences (Wenger, 1998b).

This relativist approach that tends towards the ephemeral character of the social processes which are fundamentally based on the “social actors” ways of construing and describing them’ (Miles and Huberman, 1994: 2) is consistent with the constructivist, interpretivist research paradigm (Cohen et al., 2000: Bassey, 1999: Stake, 2005). This paradigm fitted naturally with the purposes of this research, which employed the CoP theoretic as a conceptual framework for providing an understanding of the role of video conferencing in supporting the pedagogical trajectories of a large community of trainees into the larger community of teachers. Explicitly, the conceptual framework, CoP, which has been identified initially through the literature review and subsequently evolved ‘out of the fieldwork itself’ (Miles and Huberman, 1994: 18) provided some of the key issues, constructs, and themes for analysing the research data.

Since paradigms are normative in nature in shaping practitioners’ inquiries, the interpretive research paradigm underpinned this research study and gave rise to methodological considerations and issues of instrumentation and data collection (Lincoln and Guba, 1985). Its ontological assumption is that individuals are unique and independent and social reality is a construct of their consciousness (Cohen et al., 2000: Bassey, 1999: Neuman, 2006). Consequently, qualitative data provided an understanding of the learning experiences and identity construction of the trainees within communities of newcomers, facilitated by video conferencing. This was based on how they interpreted and how they experienced their identities both in practice and through their participation in their communities rather than by what is general

and universal (Cohen et al., 2000: Neuman, 2006). Thus, an interpretive approach entails both the interpretation of data as it is guided by the beliefs of the qualitative researcher on how to make sense of the data; and the interpretation of the social phenomena based on the meaning that people attributed to them (Denzin and Lincoln, 2005), as opposed to a positivistic research approach that develops research 'free of individual bias and subjectivity' (Denzin and Lincoln, 2005: 12). In the specific case, the subjective perceptions of a number of participants were gathered, that is the individual experiences, dispositions, beliefs and qualities of each participant. Consistent with Lincoln and Guba's (1985: 292) position, the objectivity of the findings here, as any other qualitative research, was conducted through 'intersubjective agreement; [which means] if multiple observers can agree on a phenomenon their collective judgement can be said to be objective'.

As a result, an interpretivist approach which contends that '...knowledge and practice are studied as local knowledge and practice' was employed in this study to reveal evidence of the use of video conferencing for developing CoP in a Primary PGCE course 'through the systematic and reflective documentation of evidence' provided by trainees, university tutors, and teachers in schools (Denzin and Lincoln, 2005: 11). An alternative selection of the positivist or postpositivist paradigm, would, firstly, denote this research as making a concession to a reality 'out' there in schools embracing 'good' practice to be approximated, captured and perpetuated by the trainees in every single classroom. Secondly, it would mean that this research should aim to develop

etic statements derived from numbers, probabilities and by isolating cause and effects (Denzin and Lincoln, 2005) on the use of video conferencing for enhancing the pedagogical transformation and identity construction of the trainees. Further, the main concern of an alternative positivist paradigm would have been to reveal what numbers of people experience in response to the phenomena rather than to explore the individual experience and disposition of each single 'observer'-participant (Lincoln and Guba, 1985).

The research issue itself required collecting qualitative data because building pedagogical knowledge and becoming a teacher through participation, social interactions and intercourse is a social phenomenon which need not be measured by numbers and percentages associated with a quantitative research design (Coyle, 2004: Basit, 2003: Squire and Johnson, 2000: Jennings et al., 1997: Cohen et al., 2000). According to Bassey (1999) there is not a kind of prescription asserting that a certain learning outcome would be achieved if a specific teaching practice is followed. Hence, if 'educational research is to improve the knowledge base of teachers' it should focus on teachers' craft knowledge which can be acquired primarily in the field where teaching takes place, in the classroom and in schools (Bassey, 1999: 49). Bassey's (1999: 49) viewpoint is in line with this study's literature review and rationale for pursuing this research since it is argued that the enhancement of the trainees' pedagogical knowledge was facilitated within CoP by actively gaining insights to the teachers' craft knowledge (Baek and Barab, 2005).

According to Miles and Huberman (1994: 2) the interpretivist paradigm 'needs methods that are credible, dependable, and replicable in qualitative terms'. Therefore, a robust case study was designed to investigate, interpret and reveal in-depth, valid data within the real-life context of the trainees' CoP, and led to fuzzy generalisations (Yin, 2006: Bassey, 1999: Kemmis, 1980). According to Stake (2005: 454) the case study provides experiential knowledge which seldom occurs 'to the individual alone [but] more often in the presence of others'; hence, it is in line with the conceptual framework of the research which underlines the importance of trainees' active participation in the community of teachers in understanding the teaching culture and becoming teachers. Thus, the case conveyed the experience of the participants as well as the experience of the researcher who studied the case and subsequently, 'enhance[d] the reader's experience with the case' (Stake, 2005: 454), The next section discusses further the case and the two research schemes implemented.

3.4 Stages in the research process

3.4.1 Identifying the case

Consistent with Stake's viewpoint (2005: 451), 'my choice will be to choose that case from which we feel we can learn the most'. Therefore, the specific case of a Primary PGCE course was selected for accessibility reasons to allow 'building in variety and acknowledging opportunities for intensive study' (Stake, 2005:

451). It was sought to become an exemplar case of a teacher education course that integrates video conferencing learning environments from the outset.

Consistent with Bassey, (1999: 12) an in-depth understanding of 'the particularity and complexity' of a case study enabled fuzzy generalisations to be conceived in the form of 'it is possible, or likely, or unlikely that what was found in the singularity will be found in similar situations elsewhere'. Otherwise, it would have been contradictory and probably invalid to claim any definite or absolute generalisations from one single case study or 'study of singularity' due to a number of interrelated factors involved in educational settings (Bassey, 1999: Stake, 1995). These may include the paramount 'human complexity' in education which is also affected by the 'rules' of the specific school or university, the teaching situations or circumstances, the number of involved educational actors or policy makers (pupils, teachers, parents, administrators) and the variety of academic tasks or subject matters (Bassey, 1999: Stake, 1995). Further, the research results of the specific research study were influenced by the technical capacities of the geographical region in which the university and schools were located and the various degrees of capabilities of the people involved in using video conferencing.

Due to the element of uncertainty carried in fuzzy generalisations the characteristics and details of the case are explained for enabling judgements to appeal as to whether the case is similar to, but never the same as, others of its

type. Primarily this invites other researchers or teacher educational providers to contribute in the discourse, by testing and reporting their own findings for influencing future practices in teacher education (Bell, 2005: Denscombe, 1998: Bassey, 1999). The research was undertaken during the nine-month Primary PGCE course accommodating a number of video conferencing links because becoming a pedagogically thinking teacher involves gradual and continuous identity transformation over time. Figure 3.3 presents graphically the format of specific course and the integration of video conferencing events throughout the course for the purposes of this research. Thus, while the implementation of a single video conferencing link was unlikely to contribute substantially to the construction of trainees' pedagogical knowledge, its continuous use over the course for supporting reflection within CoP has the potential to do so. In the following graphic, the VC1 (video conferencing one), VC2 and VC3, indicated in green boxes, are the three video conferences implemented throughout the course, at the university, for remote classroom observation, whereas, the VCs-TE1 (video conferences on teaching experience one), VCs-TE2 and VCs-TE3, indicated in orange boxes, are the multi-point video conferences on the three blocks of TE.

In the following section, a brief discussion of the pilot phase and the process of engaging participants precede the concise description of the two research schemes, of the remote classroom observation and of the multi-point video conferences.

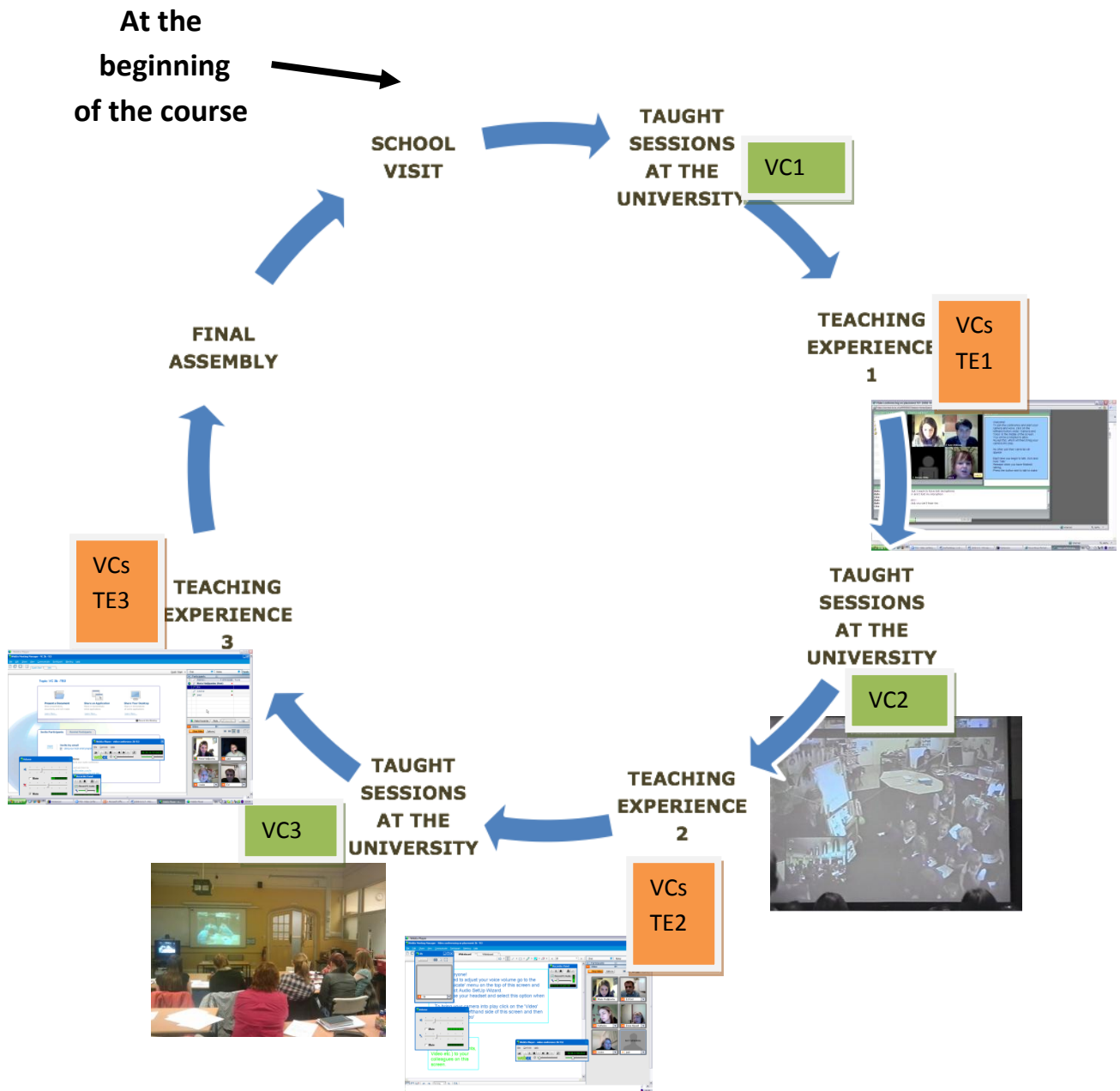


Figure 3.3: The course format of the specific primary PGCE course and the dispersed video conferencing events throughout the course whilst at the university or on TEs

3.4.1.1 Pilot phase

A three-week pilot study took place during 2007-2008 PGCE course (a year before the actual study) aiming to resolve numerous issues associated with the

organisational and technical issues of implementing multi-point video conferences. Over the three weeks of a TE a group of four trainees interacted with one another via video conferencing, once a week, at a pre-arranged time lasting approximately one hour each. Interestingly, a 'familiarisation model' of video conferencing use was attempted during the video conferences, which means that it was focused on trialling and testing the multi-point video conferencing system (Comber et al., 2004). However, the aim of the actual project was to explore an 'enhancement model' of video conferencing to empower online the trainees CoP and enrich the conventional block of teaching practice (Comber et al., 2004).

In this small scale pilot study, the trainees evaluated the potential of video conferences during their TEs positively, indicating that opportunities for reflection, for peer scaffolding and peer support, as well as, for social interaction were provided. Some of their comments about their experiences were that: 'They [video conferences] added a new and different dimension to recording your own personal reflections', 'Not having seen anyone other [peer] than the students placed at my school, it was nice to see familiar faces and talk about some of the daily issues [arose at schools]'. Thus the opportunity to share and discuss immediate experiences was pointed out.

Other conclusions revealed related to organisational issues were that the video conferences should be as reliable as possible without any disruptive technical

problems. Further that the trainees had difficulty in finding a common time slot to conduct the conferences because of their busy schedule; therefore they were allowed to schedule their meetings to fit into their own timetable during the actual study. Moreover, they felt that each meeting might be of more benefit if it acquires more structured opportunities for reflection and analysis of their TEs. This was achieved by setting a conference agenda comprised of pedagogical issues and core teaching competencies to discuss during the actual study including assessment for learning, instructional management, organisation and questioning skills. Further, the trainees identified the need to develop a discussion protocol for regulating the flow of their conversations during the video conferences including how to indicate a wish to talk or to communicate a technical problem. These organisational factors are consistent with guidance offered by Arnold et al. (2004) and Comber et al. (2004).

Moreover, the pilot phase revealed evidence that at least one tutor should be present at each conference in order to guide the trainees' discussions and to enable them to undertake a focused process of problem setting and analysis. For this reason a university tutor was invited during the actual study. The overall positive attitudes and technically possible video conferencing events opened the directions to be further pursued during the 2008-2009 PGCE course including a greater number of trainees. Hence, a greater number of trainees (one hundred and nineteen) were encouraged to become involved in the video conferencing sessions.

3.4.1.2 Engaging participants

Engaging participants - trainees, university tutors and schools - in new learning environments supported by the technologies is to a certain extent a demanding but feasible task to accomplish. This is because the majority of people were usually open to new ideas but cautious when relying on technologies, or on other people's work including researchers, technicians or partners, and when the outcomes of an activity were promising but still under study. In some cases, the process of engaging participants was time-consuming. Initially, the university's partner training schools, invited either by emails or through the telephone, did not become involved in the study due to the lack of appropriate equipment, poor interest or insufficient time to devote to the research. As 'initial design decisions nearly always lead to redesign', snowball sampling was subsequently employed as a technique for drawing school participants (Miles and Huberman, 1994: 16). As a result, the head teacher of a local school showed his personal interest, gave his consent and put effort into engaging one of the teachers in his school to participate in a video conferencing link with the university. However, the school neither acquired any dedicated video conferencing equipment nor had they any prior experience in using or participating in a video conference. The university had, therefore, to loan dedicated video conferencing equipment to the school to commence the study, offering an opportunity for the school to use the equipment for the purpose of enhancing the school's curriculum activities if they wished. However, still more participant schools were required for the research.

The long process of 'building, revising and 'choreographing' the study (Miles and Huberman, 1994: 16) led to opening new ways of engaging participants. An online invitation to schools across the UK was issued, expanding dramatically the geographical reach of the study from local school to schools across UK, through the news feed of JANET Collaborate's website www.janetcollaborate.ac.uk. This is a service prototype aimed at networking people across the education community including teachers, lectures, researchers, museums, galleries, archives and other content providers to find partners to share and pursue collaborative work preferably via video conferencing. A number of teachers, school ICT coordinators, head teachers and people from various local authorities replied positively to the invitation. Eventually, cooperation with a gatekeeper of this research, a Teaching and Learning Consultant in ICT of a local council, was established. In turn, he elicited the interest of teachers and schools in his region. The interest of the local authority in promoting video conferencing at its region's schools and the high level of experience and skills in using video conferencing equipment and implementing links, made them interesting partners in this research.

In parallel, at the university site, attempts were made to canvass and accumulate interest from university tutors and trainees during 2008-2009 for the actual study. Thus, this study involved four university tutors - two Literacy Coordinators and two Science Coordinators - approximately thirty trainees willing to participate in desktop multi-point videoconferencing links and to share their teaching and learning experiences whilst at a distance, as well as the

whole PGCE cohort of one hundred and nineteen trainees participating in remote classroom observations. The research was conducted based on opportunity samples (Bell, 2005) as the participation in both online meetings and remote classroom observations were appointed as an optional strand rather than enforcing a compulsory participation, although trainees were encouraged by university tutors to join video conferences. Finally, approaching and engaging a technical team at the university site and negotiating with technicians at the schools' site was essential.

3.4.1.3 'Sub-cases': (1) Multi-point video conferences during TE

The second research scheme was designed to link into a multi-point video conferencing platform groups of three to six trainees, once a week, for approximately an hour to reflect, discuss and share their TEs, thoughts, feelings, concerns or successes with their peers from the comfort of their homes.

Initially, a university tutor was involved in the research, offering to all of the trainees (twelve in total) in her specialist subject group the option to engage in a live 'tutorial-at-a-distance' via video conferencing. The initial plan was to arrange these once a week during the three weeks that the trainees were on their first school TE (VC-TE1). The tutor saw the project as an opportunity for having an additional follow up meeting with her trainees after observing them at

schools. In practice these trainee-tutor kind exchanges took place on two occasions, the third was not possible due to unanticipated work commitments on the part of the tutor and some technical errors. However, two of the trainees were sufficiently engaged by the process to continue to talk to one another, not only after the tutor-trainee discussion in weeks one and two of the TE, but also during the final week of their first TE.

During the second and third teaching experience (VC-TE2 and VC-TE3) the group dynamics of the trainees had changed dramatically since all the one hundred and nineteen trainees were invited to attend video conferences on TE. Seventeen of them were interested in talking to their peers and sharing their struggles and successes during the long period of five and six weeks during the second and third TE respectively. The trainees had the right to enrol or just drop-in at a meeting at a given time. Table 3.1 presents detailed information of the video conferencing events on TE, including the number of participants at each video conferencing, the duration of the actual discussion that occurred, the time slot provided for the video conference –each call lasted approximately an hour- and the meeting platform that hosted the links. Emails were used for scheduling, communication and socialisation purposes, thus an email distribution list was created to enable trainees know who would join which meeting. The time slot that was not recorded for the purposes of this research was mainly socialisation chat or in cases that trainees asked to ‘close’ the call earlier or time needed for getting the technologies to work.

Table 3.1: Video Conferencing events on TEs

<i>Multi-point video conferences on TE (PGCE Cohort 2008/9)</i>							
<i>VC code</i>	<i>Date of VCs</i>	<i>TE</i>	<i>Time slot of the VC</i>	<i>Duration of the recorded discussion</i>	<i>Number of trainees-participants</i>	<i>Presence of a Tutor</i>	<i>Meeting Platform</i>
VC TE1	31/10/08	1	5:45-6:45 PM	00:16	3	Yes	Adobe Connect
	05/11/08		5:45-6:45 PM	00:56	3	Yes	
	12/11/08		6:15-7:15 PM	00:34	2	None	
VC TE2	29/01/09	2	6:00-7:00 PM	00:42	5	None	Intercall (WebEx)
	05/02/09		5:30-6:30 PM	00:28	2		
	05/02/09		7:30-8:30 PM	00:46	4		
	11/02/09		5:30-6:30 PM	00:45	3		
	12/02/09		7:00-8:00 PM	00:56	6		
	25/02/09		5:30-6:30 PM	00:30	3		
	05/03/09		7:00-8:00 PM	00:59	3		
	11/03/09		5:30-6:30 PM	00:57	2		
	12/03/09		7:00-8:00 PM	00:38	4		
VC TE3	27/05/09	3	5:30-6:30 PM	00:39	3	None	Intercall (WebEx)
	28/05/09		7:30-8:30 PM	00:50	2		
	04/06/09		9:00-10:00 PM	01:04	3		
	11/06/09		9:00-10:00 PM	01:10	3		

3.4.1.4 ‘Sub-cases’: (2) Remote classroom observations

During the first semester the whole cohort of one hundred and nineteen trainees with their English coordinator and university tutors in English observed via videoconferencing a teacher at a local school (VC1) and a month later at a distant school (VC2), deliver live Literacy lessons in Key Stage Two and in Foundation Stage (Reception) (VC3) respectively. During the second semester the logistics of the video conferencing (VC3) changed. The Science Specialist Group which is a subgroup of the whole PGCE cohort – the members of which had therefore participated in the earlier, whole-cohort videoconference -

consisted of twenty trainees with their Science Coordinator. They observed along with their university tutors in Science observed via video conferencing a teacher at the distant school deliver a live lesson in Science in Year Six.

The logistics and specifically the group dynamics were changed deliberately to allow the drawing of conclusions related to the impact of the size of the group of trainees participating in a remote classroom observation. It was particularly interesting to investigate the impact of the group size on the effectiveness of the interaction slot of the group with the 'live' class. In fact, the involved university tutors had decided to move from the larger group situation to this smaller one during video conferences because they wanted to 'see' whether the trainees will feel more relaxed and at ease to ask questions to the teacher and the children during the interaction slot. Their argument was that the acoustics in a smaller room when talking to the microphone were better as opposed to in a large hall theatre and foremost talking within a smaller group of peers as opposed to in front of their whole cohort group was less intimidating.

Other particularities among the sub-cases were the different level of experience and capability in using the video conferencing equipment between the local and distant school, first users as opposed to advanced users correspondingly. Table 3.2 presents this information.

Table 3.2: Video conferencing events between the university and primary schools in UK

<i>Remote Classroom Observations (PGCE Cohort 2008/9)</i>					
<i>VC code</i>	<i>Date of testing</i>	<i>Date of actual VCs</i>	<i>Number of participants at the university site</i>	<i>Schools' proximity to the university- Level of expertise- Class observed</i>	<i>Lesson observed</i>
VC1	29/09/08 30/09/08 02/10/08	09/10/08	Whole PGCE Cohort Group (119 Trainees with University Tutors in English & English Coordinator)	Local School (First users of video conferencing) (Key Stage Two)	Literacy Lesson
VC2	12/11/08	26/11/08	Whole PGCE Cohort Group (119 Trainees with University Tutors in English & English Coordinator)	Distant School (Advanced users of video conferencing) (Foundation Stage - Reception)	Literacy Lesson
VC3	19/03/09 (Introductory session involving the teacher and the university tutors)	30/03/09	Specialist Science Group (20 Trainees with a University Tutor in Science & Science Coordinator)	Distant School (Advanced users of video conferencing) (Year Six Class)	Science Lesson

Prior to the establishment of the video conferencing links, the university tutors had been told to set a pedagogical agenda for their trainees to take account of during the observation, supporting in this way the pedagogical goals of their course. The format of the link was as followed: at the beginning of the lesson the participants exchange greetings and the teachers explain the lesson objectives; the university's site was then muted to enable trainees to observe and make notes and prepare questions while the lesson proceeded; and at the end of the lesson, both sites interacted with each other and engaged in a

pedagogical dialogue. The final video conferencing (VC3) further included a preface video conferencing introductory session between the two university tutors located at the university with the experienced teacher and a Teaching and Learning Consultant of ICT of a local council aiming to get to know each other, setting objectives and 'breaking the ice' before the actual video conferencing with pupils and trainees.

3.4.2 'Getting the technologies right'

Two portable dedicated units were used for implementing remote classroom observations because they were suitable for connecting small to medium teaching classrooms with the university. Allowing sufficient time to test the technologies, both equipment and connectivity, before planning the video conferencing links between trainees and the school class was an appropriate course of action. At the beginning of the process, various technical issues arose, partly due to the initial inexperience of those involved in conducting video conferencing. These diminished as both researcher and participants became familiar with the technology. The Videoconferencing Service (JVCS) of JANET's (Joint Academic NETwork) was booked, at no cost, to establish and record these IP videoconferences with the schools.

Computer-based desktop video conferencing along with cheap web cameras, headsets and microphones were used for the weekly online meetings among

trainees because it is a viable and convenient way to simultaneously connect two or more remote users in a call (multi-point communication) (Arnold et al., 2004: Comber et al., 2004: Potter and Roberts, 2007: Ja.Net Training, 2008). Integrated VoIP which is internet telephony connection enabled trainees to talk to each other. A web camera was provided to each participant for the purposes of the research study. However, choosing an appropriate Multi-point Control Unit (MCU) Software which is a bridge that interconnects calls from several sources was the major concern when planning online meetings for trainees (Ja.Net Training, 2008). Initially a free to use software, Adobe Acrobat Connect Professional software, was chosen for the online virtual meetings. However, several technical issues led to the search for a more reliable platform.

A number of commercial companies providing software packages for video conferencing were considered, and one of them was chosen based on the low-cost criterion. In this way, a high quality platform was provided to keep participants focused on reflecting on and sharing their TEs. The on-screen area provided a number of functions, allowed up to eight participants, live interaction on the video area, sharing screen and other applications (whiteboard, PowerPoint or documents) synchronously on the data area. This had a number of annotation tools and downloading facility, public and private chat area for asynchronous communication and notes area.

3.4.3 Identifying techniques of data collection and sources

In the process of identifying techniques of data collection the pilot phase of the research study assisted in ensuring consistency between the methods of data collection and the conceptual framework of the research study. Explicitly, the initially selected data collection methods included a piloted questionnaire distributed to trainees in the pilot phase to elicit information about previous experiences with using video conferencing technologies, opinions on video conferencing experience and suggestions for improving future virtual meetings. However, questionnaires were replaced by group interviews in the actual study to honour the socio-cultural nature of knowledge construction which manifests meaning to be constructed and re-constructed by group of people sharing same or similar working conditions (Bell, 2005: Wenger, 1998b).

Group interviews sought to reveal 'how people, in conjunction with their interactions with one another, feel about' the extent to which their virtual communication, either with each other or with a live school, contributes in realising their pedagogical trajectories to become teachers (Bryman and Teevan, 2005: 194). The facilitator-researcher did not intrude into the group discussions, but rather allowed trainees to hear each other, 'to qualify or modify a view', agree with each others' perspectives or challenge each other and disagree; a process that can reveal 'realistic accounts of what people think' in a communal manner because essentially 'individuals collectively make sense of a phenomenon and construct meanings around it' (Bryman and Teevan,

2005:195). The aim was not to bring out consensus on various issues among the participants but to reach more spontaneous and different viewpoints (Kvale, 2007). A digital voice recorder retained resources of the group sessions. Participants were aware that they were being recorded and they had given their formal consent.

Further, audio and video segments of the meetings were recorded by the researcher once permissions were gained from the participants for ethical reasons. Thus, content analysis of two video conferences triangulated the data obtained from the questionnaires. Explicitly, the recorded data from the video conferences were transcribed and coded in NVivo software alongside the data revealed from the questionnaires.

Essentially, research evidence of the video conferencing experiences was collected through nine group interviews with trainees (five on remote classroom observations and four on video conferences on TEs) and six individual interviews (three with university tutors and three with teachers at schools on remote classroom observations). Further, fifteen video conferencing recordings on TEs offered a rich data upon to base the questions posed during group interviews and validating the claims made during interviews. The data collection techniques and sources sought appear graphically in Tables 3.3 and 3.4.

Table 3.3: Techniques of data collection and sources for remote classroom observation (video conferences)

Data Collection Techniques and Sources – Actual Study (PGCE Cohort 2008/9)					
Remote Classroom Observations via video conferencing					
Group interviews			Individual interviews		
Date	Number of trainees	VC	Date	Interviewee	VC
09/10/08	9	1	12/10/08	University Tutor	1
09/10/08	2	1	14/10/08	Experienced Teacher	1
1/12/08	3	2	28/11/08	University Tutor	2
1/12/08	3	2	3/12/08	Experienced Teacher - ICT Consultant (Local Authority)*	2
1/4/09	3	3	31/3/09	University Tutor	3
			9/7/09	Experienced Teacher with the ICT Consultant (Local Authority)*	3

*Took place via video conferencing

Table 3.4: Techniques of data collection and sources for the video conferences on TEs

Data Collection Techniques and Sources – Actual Study (PGCE Cohort 2008/9)		
Online video conferencing meetings on TEs		
Group interviews		
<i>Date</i>	<i>Number of trainees</i>	<i>TEs</i>
17/11/07	2	1
16/3/09	8	2
16/3/09	2	2
1/7/09	2	3
15 Content Analysis of Video Conferencing Recordings		

The group interviews conducted took place at a prearranged time once after the remote classroom observations via video conferencing or at the end of each TE when the trainees came back to the university. The groups' composition ranged

from three to nine people proportionally to the population involved in each sub-case. In Table 3.3, column 2, one could notice that the group size of the interviews with trainees varied because the participation of trainees in group interviews was on a voluntarily basis and, because as already mentioned, the group size of participating trainees during remote classroom observation video conferences had changed to allow more interactivity during the discussion slot with the school. Explicitly, at times when one hundred and fifteen trainees had participated in video conferences then the participation of trainees in the group interviews resulted in a large group interview composition of nine trainees, whereas the volunteering participation of trainees in group interviews after the remote classroom observation at which twenty trainees had participated resulted in a group interview composition of three trainees. The concept of 'theoretical saturation criterion' was applied which means that the number of group interviews were considered adequate when it was anticipated 'fairly accurately what the next group is going to say' (Bryman and Teevan, 2005: 196).

The questions selected for the group interviews varied because group interviews took place at different time and in different stages on the course – after TE1, TE2 and TE3 - thus questions were related to the experiences and the stage of the professional development experienced by trainees at each time. However, the questions overall aimed to cover issues related to evidence of CoP(s) in the course and information about the value of the video conferences as an integrated tool in the primary PGCE course. Explicitly, the

group interviews related to the video conferences on TE were divided into three sections: eliciting any evidence of CoP within the PGCE course, eliciting any evidence to indicate sustaining distributed CoP via video conferencing and finally, evaluating video conferencing experience in their learning. Those themes were expanded after each of the three TEs to include learning trajectories' perspectives, identity conflicts or overlapping elements, evidence of legitimate participation activities at schools and construction of a sense of belonging since the transformation on trainees' identity towards becoming teachers was apparent during the video conferences on TE. These issues were not explicit questions posed to the participants, in other words, participants were not asked directly to give 'evidence of legitimate participation activities', but these themes were hoped to be explored through indirect questioning. Appendix B, C and D present the indicative questions posed during the group interviews after the three TEs and Appendix E, F and G present questions posed after VC3 to the involved trainees, university tutors and experienced teacher. Those questions were only used as a canvass to build up the group discussion rather than used as one-to-one closed questions and answers.

Further, recognising some of the shortcomings of the group interviews was the first step towards dealing with them. They included handling dominant and reticent speakers, taking time for transcribing because of the dissimilarities in voice pitch and making efforts to make sense of inaudible comments or talking over each other (Bryman and Teevan, 2005: Kvale, 2007).

A videoconferencing group interview was also conducted with the distant partners, two experienced teachers and a gatekeeper. Although video conferencing provides 'new venues for conducting research', backup plans were needed in cases of technological failures as experienced in this study (Markham, 2004: 96). Finally, video-recordings of every video conferencing were exploited as qualitative data resources and a research diary was kept through close observation of all video conferences. Overall, through interviewing and observation of video links a deeper understanding of the participants' perspectives and the social world in action was captured (Denzin and Lincoln, 2005).

3.4.4 Considering ethical issues

'Qualitative researchers are guests in the private spaces of the world. Their manners should be good and their code of ethics strict' (Stake, 2005: 459). One of the preliminary steps in the research process was to obtain the university's ethical approval for conducting the research. Further, consistent with Stake (2005) there is a kind of an implicit contract developed between the researcher and the researched. In the specific case, this was developed through the two years prolonged engagement of the researcher in the field –in the course-aiming to canvass interest for the study, to become orientated in the culture, to build trust and 'to demonstrate to the respondents that their confidences will not be used against them; that pledges of anonymity will be honored' (Lincoln and Guba, 1985: 303). Thus, all trainees participants were fully informed about the

purposes of the research study by the researcher, the involved university tutors and throughout the research study, by their own colleagues who had already received video conferencing experiences since the nature of the study ought to invite more participants all along the way (during TE1, TE2 and TE3 and for three remote classroom observations throughout the PGCE course). Anonymity and confidentiality were ensured by anonymising the raw data (British Sociological Association, 2004: Walliman, 2005: BERA (British Educational Research Association), 2003)

As the research study involved minors in school classes, parental permissions were obtained for the children's participation in video conferences with the university and for allowing video recording of the sessions (see Appendix H) (ESRC (Economic and Social Research Council), 2005). Some parents sought (and received) assurance that everyone involved in the link had Criminal Records Bureau (CRB) clearance. Formal consent letters were also signed by the involved university tutors, trainees and participating experienced teachers.

3.4.5 Limitations

Although, qualitative data 'are a source of well-grounded, rich descriptions and explanations of processes in identifiable local contexts', the generalisability of the generated findings can be questioned (Miles and Huberman, 1994: 1). Therefore, this research aims to produce fuzzy generalisations and invite

interested actors to enter into discourse, take decisions and test the finding of this research as 'even intrinsic case study can be seen as a small step toward grand generalization' (Stake, 2005: 448). Further, the presented qualitative research which was based on the experiential knowledge of the participant, primarily of the trainees, led to a subjective and intersubjective evaluation and description of the collected data for providing a constructed reality of the dynamics of the CoP and the value of video conferencing in teacher education (Heron and Reason, 1997: Denzin and Lincoln, 2005: Stake, 2005: Lincoln and Guba, 1985). As a result, inherent limitations of the qualitative study includes the 'value-laden nature of inquiry' (Denzin and Lincoln, 2005), the possibility of existing researcher's bias and pre-oriented ideas (Miles and Huberman, 1994: Kemmis, 1980).

3.4.6 Enhancing Trustworthiness of the Research Study

Trustworthiness as a goal of data collection, data interpretation, generalisations and overall research design served 'the ethic of respect for truth in [this] case study research' (Bassegy, 1999: 75). As mentioned earlier, although fuzzy generalisations were produced from this case study, judgments about the transferability of the final conclusions to other contextual settings including teacher education, higher education, continued professional development, web-based educational communities, international communities and other disciplines are assigned to the readers (Lincoln and Guba, 1985: Kemmis, 1980). The subjective nature of this study led 'terms such as credibility, transferability,

dependability, and confirmability to replace the usual positivist criteria of internal and external validity, reliability, and objectivity' (Denzin and Lincoln, 2005: 24); because although these criteria essentially work in parallel, they allude to different epistemological postures (Lincoln and Guba, 1985: Bryman and Teevan, 2005: Bassey, 1999).

Explicitly, the credibility of the findings in this study was enhanced by the researcher's 'prolonged engagement' (Lincoln and Guba, 1985: 301) of two years invested in the field, the Primary PGCE course. According to Miles and Huberman (1994: 6) gaining an 'holistic ...overview of the context under study: its logic, its arrangements, its explicit and implicit rules' is required to enable, according with Stake (2005) reflecting, revising and understanding the case, in the specific case. At the same time, an intentional detachment and uninvolved participation of the researcher (Bryman and Teevan, 2005) enhances the probability of producing credible findings and achieve 'risen above...own preconceptions' to remove pre-existing bias (Lincoln and Guba, 1985: 303). Engagement in the field provided an understanding of the contextual settings and multiple factors which impinged upon or facilitated the integration of the video conferencing tool in the course including the long time required for negotiating mutually suitable slots for participants in planning video conferencing, testing technologies and finding partners at schools.

Further, for improving credibility and thus the degree of trustworthiness of the research, triangulation by methods and data sources was undertaken as a strategy to provide in-depth understanding, complexity and rigour to the research questions (Flick, 2007: Denzin and Lincoln, 2005). 'Triangulation is the simultaneous display of multiple, refracted realities' (Denzin and Lincoln, 2005: 6). Similarly, according to Stake (2005: 454) triangulation clarifies the 'diversity of perception', at the specific case, of a video conferencing event and the process of becoming a teacher. Thus comprehension of the dynamics of each video conferencing learning environment in the PGCE course emerged through identifying patterns and/or competing meanings and perspectives of all involved participants and mediators including trainees, university tutors, experienced teachers and the gatekeeper (Stake, 2005).

To further minimise potential uncertainty of data interpretation, evidence revealed from the interviews were verified and analysed against those revealed from the content analysis of the video recordings (Lincoln and Guba, 1985). The recorded material of each video conferencing, additionally, provided an archive of the 'raw' data upon which interpretations are demonstrated: described as referential adequacy (Lincoln and Guba, 1985). This means that the digital capturing of the particular events provided the opportunity for the researcher to transcribe, examine, analyse and compare them with other collected data - in particular group interviews. Further, they provided a benchmark 'against which later data analyses and interpretations (the critiques) could be tested for adequacy' (Lincoln and Guba, 1985: 313). Explicitly, the

evidence of trainees' talk during group interviews on their experiences of video conferencing whilst on TE could be traced back via the recorded video conferences events upon which they are based. Further, the researcher not only had been present during video conferencing events, as an unobtrusive observer, but also had transcribed the video conferences before composing a group interview schedule or conducting a group interview.

Since there is no credibility without dependability, just as there is no validity without reliability in positivist research, all of the above techniques - and triangulation, prolonged engagement in the field in particular - enhanced the dependability of the findings which means that findings are likely to be consistent over time (Bryman and Teevan, 2005). Further, peer debriefing with the supervisor assisted not only in stewarding new steps in the research process and emerging methodological design, but also in cross-checking the list of codes to produce justifiable results (Lincoln and Guba, 1985). Hence, the process by which the supervisor posed questions to the researcher aimed at probing biases, in exploring meanings, in clarifying the basis upon which the interpretation was drawn and thus helped the researcher to remain 'honest' (Lincoln and Guba, 1985: 308). Moreover, the debriefing sessions provided the opportunity to the researcher to defend the working hypothesis and 'direction in which [...] her mind [was] taking [...] her' but other times led to a reconsidered or refined position (Lincoln and Guba, 1985: 308). Foremost, as Lincoln and Guba (206: 308) advise 'debriefing sessions provide the inquirer an opportunity for catharsis, thereby clearing the mind of emotions and feelings that may be

clouding good judgement or preventing emergence of sensible next steps'. Explicitly, the researchers' position was reviewed at several points throughout the research process including during expanding the research across UK for engaging participants, when employing video conferencing platforms like Adobe Connect and WebEx in order to proceed with the research and at selecting methods of data collection. Further, presenting the research framework and initial findings at DIVERSE (Developing Innovative Visual Educational Resources For Students Everywhere) Conference and a doctoral study school the study subject was put under critique from an expert audience.

Finally, a key technique for increasing confirmability of the data was the investigator's reflexive diary which – throughout the study – both captured design decisions and judgments that were made on the grounds of sampling procedures, planning video conferencing events, daily research schedule and logistics of the video conferences (Lincoln and Guba, 1985) and, in the light of such reflections, provided the basis for ongoing revisions to aspects of the research design.

The next section discusses the data interpretation process which follows a number of steps to ensure that conclusions trace back to the original sources, interviews and video recordings.

3.4.7 The process of analysing the research data

During an extended period of one academic year throughout 2008/2009, a database of evidence consisted of eight group interview transcripts with thirty-two trainees; five individual interview transcripts with three university tutors and two experienced teachers and eighteen transcripts of multi-point video conferences with twenty-one trainee, was gathered. As aforementioned, the pedagogical professional development of trainees was conceptualised within the general concept of CoP and with a specific focus on the notion of legitimate peripheral participation (Wenger, 1998b; Lave and Wenger, 1991). Through these conceptual lenses the raw data was interrogated to produce thick descriptions by an 'inescapably selective' process (Miles and Huberman, 1994: 56) because neither 'everything about the case can be understood' (Stake, 2005: 448) nor the researcher or the research participants see or comment on everything.

The transcripts of the video recorded data from video conferences on TE were anonymised to ensure confidentiality and coded in NVivo software alongside data revealed from the group interviews for triangulation purposes (Gibbs, 2007). In this way, the subjective preliminary analysis of the raw data from the informal trainees' discussions was checked during the interviews since the trainees were asked directly to talk about specific research issues. Similarly, the perspectives of trainees on the remote classroom observation were coded alongside the university tutors' and experienced teachers' opinions to offer the

opportunity for making comparisons. The computer-aided analysis in NVivo7 software offered an easy entering, retrieving, organising, coding and categorising system for the collected data (Basit, 2003: Welsh, 2002: Miles and Huberman, 1994). Hence, the raw data were pre-coded, coded, and continuously interpreted as an iterative process to contrast, compare, verify, modify and produce patterns and category labels until the analytical statements were considered trustworthy (Bassey, 1999: Stake, 2005: Miles and Huberman, 1994: Lincoln and Guba, 1985).

Line-by-line coding was a way of starting data analysis forcing reflection on the world that the trainees and university tutors experienced, and producing rather descriptive codes (Gibbs, 2007). An a priori analytical coding was used for eliciting evidence of the CoP's framework including attributes, components, themes; and descriptive codes using metaphors or states derived from participants' utterances for uncovering the ways in which trainees come to understand and manage their everyday learning contexts (Gibbs, 2007: Miles and Huberman, 1994: Lacey and Luff, 2007). Hence, concept-driven coding was carried out since a framework of potential conceptual codes was created prior to analysing and applying codes to the data, as shown in Table 3.5 (Gibbs, 2007). However, the vigorous process of going back and forth between transcripts and codes comparing them against each other sought to refine and redesign the list of codes to include new ideas and categories and ensure consistency to the data (Miles and Huberman, 1994: Gibbs, 2007).

Table 3.5: List of *a priori* codes

List of Codes – CoP Framework	
Legitimate Peripheral Participation	Regimes of competence
▪ Mentor/ Mentee relationship	▪ Accountability to the enterprise
▪ Participation vs. Non Participation	○ Indigenous enterprise
▪ Legitimacy	▪ Mutuality of engagement
▪ Peripherality	▪ Negotiability of the repertoire
▪ Partiality	
▪ Shared repertoire of practice	
Identity construction issues	
▪ Identity as negotiated experience of self	
○ Experience of identity in practice	
○ Institutional reification of competence	
○ Markers of transition	
▪ Identity as a nexus of multimembership	
○ Feeling, Thinking, Talking like a Teacher	
○ Feeling, Thinking, Talking like a Trainee	
○ Identity of Reconciliation	
▪ Building connections between theory and practice	
▪ Constant struggles	
▪ Successful resolutions	
▪ Identity as a learning trajectory	
○ Inbound trajectory	
○ Outbound trajectory	
○ Paradigmatic trajectory	
○ Temporal dimension of identity	
University learning community	
▪ Diversity	
▪ Homogeneity	
▪ Shared repertoire of practice	

Taking the core theme of ‘identity’ as an example, all units of data, including trainees’ sentences, lines or words which referred to this theme were given this main code and examined for subthemes (for example did the trainees talk about their perceived identity in its temporal dimension or as something fixed?) (Lacey and Luff, 2007). Units of data as in the following example were coded

under the category 'temporal dimension of identity' since they show a temporal facet and consciousness on current position:

'K: I'm doing art next week and a little literacy, not major things because I'm not comfortable enough I'm still finding my feet ... I'm limited ...

E: Right yea no I'm the same because I'm not that...'

[Trainees' multi-point video conference on TE2]

The same unit of data, shown above, was then coded in the category of 'positive outcomes of video conferences on TEs' and specifically under the code 'moral support' since the trainees received reassurance during weekly video conferences by realising and sharing that they were going through similar experiences. This means that a number of data units had taken multiple codes. This procedure of multiple coding 'encourage[d] thoroughness, both in interrogating the data at hand and in providing an account of how an analysis was developed' (Barbour, 2001: 1116). Multiple coding acted as the "devil's advocate" when revisiting collected data, refining coding scheme and revealing competing explanations (Barbour, 2001: 1116).

It should also be noted, the depth of analysis required is achieved by moving from descriptive categories like 'lack of confidence' and 'empathy' captured in the phrases 'still finding my feet', 'I'm not comfortable' and 'I'm the same' -

referred to in NVivo as free nodes - to more analytical and theoretical codes like 'temporal dimension of identity', 'experience of identity in practice', referred to as tree nodes or child nodes (Gibbs, 2007). This hierarchical system of tree and child nodes in NVivo assisted in 'dividing and subdividing major concepts into their constituent elements' (Lacey and Luff, 2007: 35). Appendix I presents screen shots of NVivo showing tree and child nodes of the data analysis identified by sources, references, date created and date modified.

Cross-case comparisons between the video conferences implemented during the three blocks of TEs was sought to elucidate evidence of trainees' learning trajectories and transition into the CoP of experienced teachers throughout the nine-months' course (Gibbs, 2007). Hence, a number of Venn diagrams were produced in NVivo programme for 'visually displaying ideas from data as an aid in developing and testing interpretations' because relationships between the concepts are represented diagrammatically (Lacey and Luff, 2007: 15). A key diagram produced in NVivo program which shows the nexus of multimembership experienced by the Trainee and the constant struggles or successful resolutions between the two identities is presented in Figure 3.4 but it will be analysed in-depth and interpreted further in the following sections.

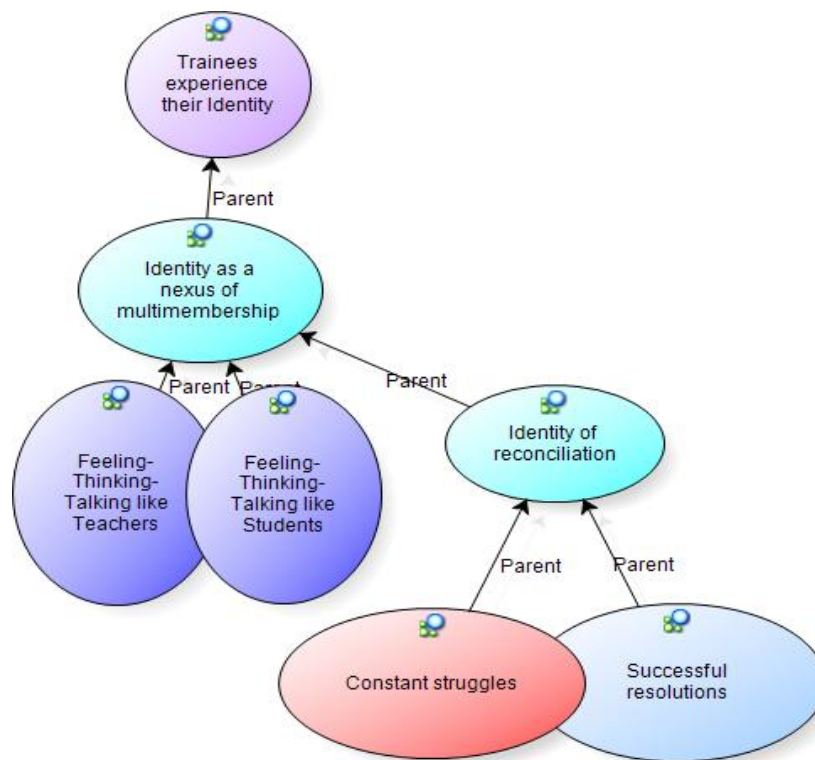


Figure 3.4: This Venn diagram presents some of the key codes of research data demonstrating the twin identity experienced by trainees, as students and as teachers

Similarly, remote classroom observations were interpreted by reviewing analytically trainees', university tutors' and experienced teachers' interviews to develop framework/models to implementing video conferences in the Primary PGCE course for supporting CoPs. Through models, queries and display of the information conclusions were drawn to provide a number of justifiable lessons and advice for future design and implementation (Miles and Huberman, 1994).

The report of findings presented against the literature review provide a 'sufficient descriptive narrative so that readers can experience these happenings vicariously and draw their own conclusions' (Stake, 2005: 450).

The results of the study are discussed, analysed and examined in the following chapter.

4 DATA ANALYSIS

4.1 Introduction

The research data in this chapter are shaped around the main research questions; as those had been refined based on the themes which emerged from this study's case. The chapter is divided into three sections.

First evidence is shown of a number of trainees' participation in two active communities, that of the professional school-based and the university-based CoPs in order to become teachers with all the identity issues involved, through the analytical lenses of the CoP's theoretical approach. It is worth noting here, as discussed previously, that these CoPs similarly to any other CoPs are located in *practice* not in *place* even though they tend to be geographically distinct. For example, when communicating via multi-point video conferences trainees are participating in their CoP of trainees, even though located at a school, therefore their community is mobile. In other words, their community can be called a 'university-based' community in the sense that it is formed in the boundaries of the course but it has no geographical boundaries.

In the second section of this chapter is an analysis of the process by which a number of trainees became teachers. This served as the foundation for the

investigation into the pedagogical value of multi-point video conferences for communication between trainees while on Teaching Experiences (TEs) at schools. The focus was on what multi-point video conferences on TEs added, if anything, to the actual process of becoming a teacher. The third section examines the pedagogical value of many-to-many video conferences for remote classroom observation at the university site. The summary of the findings at the end of the chapter draws together the results of the integration of these two forms of video conference, multi-point and many-to-many video conferences, in the Primary PGCE course, for the trainees' professional development.

Prior to analysis of the data, all exemplar video conferencing cases at the heart of this study are shown in Figure 4.1, below. A brief overview of each case is provided to inform the analysis of the data. This includes a visual snapshot of the video conference event, and information on the time it occurred in the course, the involved participants, its purpose and implementation.

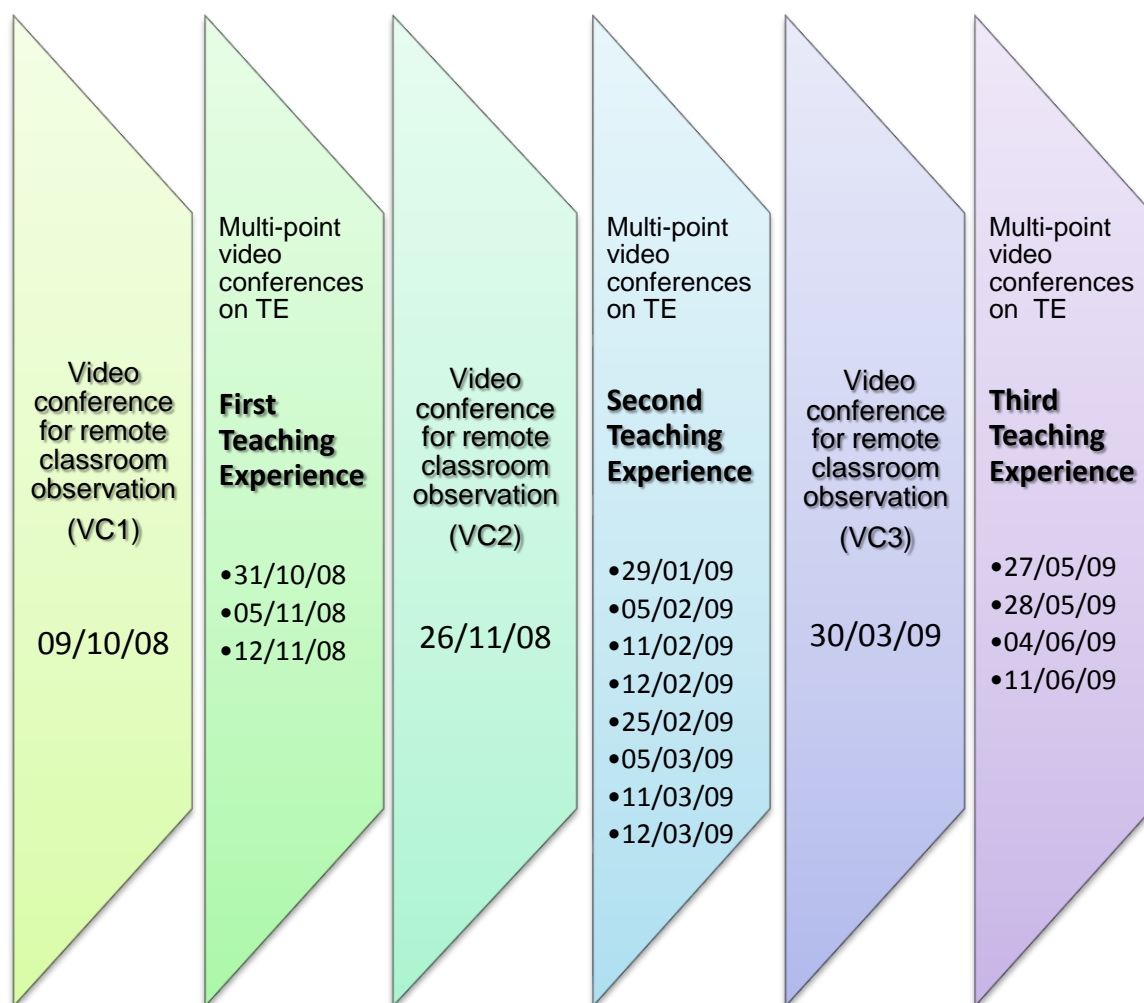


Figure 4.1: Video conferencing cases implemented throughout the nine months Primary PGCE course 2008/2009

4.1.1 Research Scheme 1: Multi-point video conferencing cases during Teaching Experiences 1-3

The multi-point video conferences aimed to connect, live, a group of trainees during Teaching Experience one (TE1) (lasting three weeks), TE2 (lasting six weeks) and TE3 (lasting seven weeks). A group of trainees used their personal computers and inexpensive web cameras (supplied by the researcher) to see

and speak to each other from their homes. At the beginning of the course only thirteen trainees were invited to join online meetings with colleagues and their Personal Tutor during the three weeks on TE1. These were arranged to take place once a week, for an hour in the afternoon, either immediately after school, or in the evening. Only two trainees accepted the invitation and were given web cameras to participate in the meetings for familiarisation purposes and for exchanging school experiences whilst on TE.

The Personal Tutor withdrew early from the study due to a number of difficulties with using the technologies. However, the trainees' feedback on multi-point video conferences on TE1 was positive overall hence they suggested inviting a greater number of peers to the online meetings on TE2 and TE3. Thus, all one hundred and nineteen trainees were invited and a group of twenty-one trainees was provided with web cameras to join online meetings with colleagues during TE2 and TE3. The video conferencing platform that enabled Internet Telephony, voice to be transferred over the Internet Protocol (VoIP) and connection of multiple sites, was replaced by a more reliable platform. During the meetings trainees talked between themselves about their TEs and supported each other in fulfilling university tasks or dealing with any issues that arose at schools. In the following snapshots of these video conferences (see Figure 4.2) the faces and names of the involved participants have been obscured to ensure anonymity.

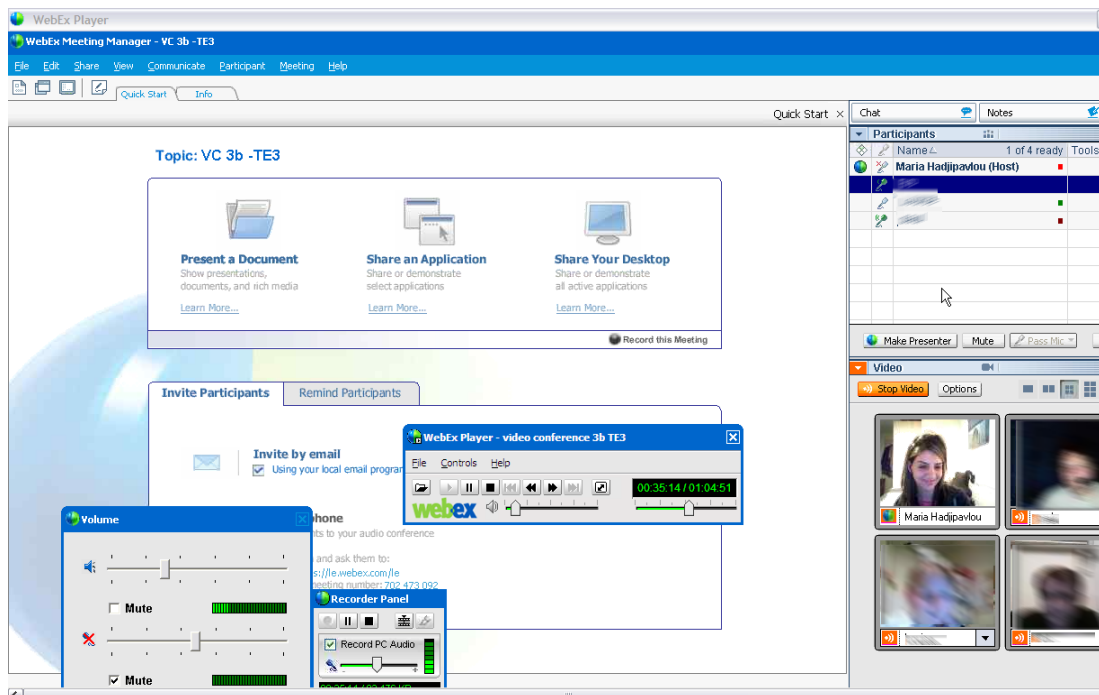
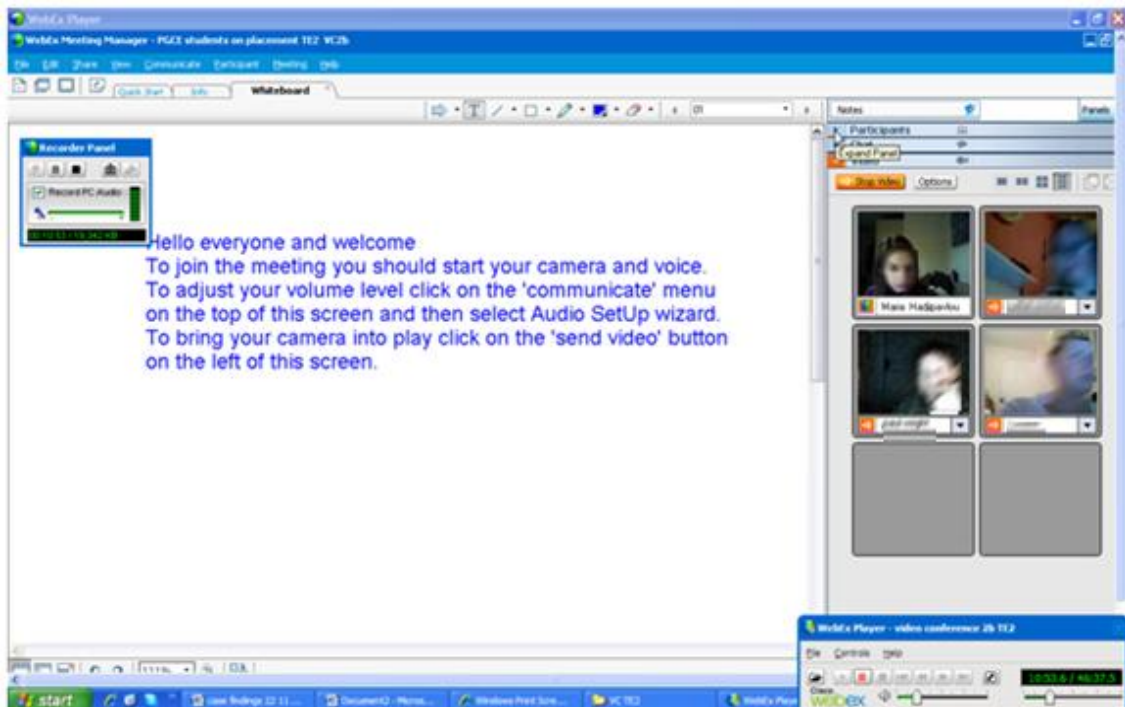


Figure 4.2: Snapshots of the multi-point video conference on three TEs: Groups of two to six trainees joined online meeting to sustain peer CoP whilst on TEs

4.1.2 Research Scheme 2: Three video conferencing cases for remote classroom observation

The first video conference (VC1) was implemented early in the course, in October 2008. It enabled one hundred and nineteen trainees to acquire a real sense of what a classroom looks like but foremost to analyse a lesson thoroughly 'as it happens' alongside colleagues and university tutors from the university site. A number of trainees had already had the opportunity to observe live lessons at schools, but never within a large group of colleagues and university tutors with whom they could share their commonly-observed experiences. The first class observed was a Year Four (pupils aged eight to nine) thirty-minute Literacy Lesson on teaching poetry. The video conference linked together the university site with a school near to the university.

A video conferencing form was constructed beforehand to be shared between the university and the school site providing all necessary information for establishing a 'live' link (see Appendix J). Also, before the actual video conference, the English subject university tutor and the school teacher had discussed via email an observational objective for the trainees during the remote classroom observation. The agreed focus was on how the teacher communicates a learning objective to children and teaches it during the introduction of the lesson. During the video conferencing link, the trainees were

provided with an observation sheet to facilitate this focus along with four questions and a space for taking notes (see Appendix K and L).

Because of minor technical problems, the VC1 was established fifteen minutes later than planned, which meant that the lesson at the school had already started before connecting with the school. The trainees were nevertheless able to observe the remainder of the lesson successfully. At the conclusion of the lesson a further technical problem occurred which meant that although the University could hear the teacher and pupils at the school, they were unable to hear the university site. However with some 'quick thinking' the trainees and university tutors managed to pose their questions by writing them on a plain piece of paper and showing it directly to the camera. The pupils and the teacher on the school site were happy to talk further about their lesson and give their comments on the lesson, what followed next, whether they enjoyed the lesson, and other issues.

The second video conference (VC2) for remote classroom observation took place at the end of November, 2008. The same preparatory procedures with VC1 were followed for the VC2, including communicating the lesson and observation's objectives between the class teacher and university tutor via emails. The procedures also included testing the technologies, exchanging a video conferencing form (see Appendix M), assigning a consent form to all involved participants, informing trainees, and preparing an observation sheet for

specifying a pedagogical focus (see Appendix N). This observed class was a Reception Class in Foundation Stage (pupils aged four to five) being taught phonics for thirty minutes. The link was established with a school located at some distance from the university campus, in another local authority (see Figure 4.3). The link was successful in terms of technicalities since the partner school was an experienced video conference user. The Local Education Authority (LEA) in the region had assigned a Teaching and Learning Consultant in ICT to support the video conference as it happened. For that reason, during the VC2 the camera was not fixed as in VC1 but was moved around the classroom by the Consultant, capturing the lesson professionally and transmitting a good quality picture. This provided the trainees with a real sense of what was going on all over the classroom, and in each specific group of pupils.





Figure 4.3: Snapshots from the VC2 connecting the university with a distant primary school: Reception Class in Foundation Stage working 'on the carpet' and then in groups

The third video conference (VC3) for remote classroom observation was implemented at the end of March in 2009. It enabled a group of twenty trainees in the Science Specialist group to observe at a distance a Year Six class (pupils aged ten to eleven) investigating light travelling in straight lines from a light source, during their Science lesson (see Figure 4.4). Additionally, a few weeks before implementing the actual video conferencing link, an initial video conferencing link took place between the two university tutors in Science, the experienced teacher and the key person from the LEA. The aim of this preliminary video conference was 'breaking the ice', testing the technologies and exchanging lesson and observation objectives. Furthermore to this, the experienced teacher emailed the university tutors with detailed information of her lesson plans including learning objectives, teaching and learning activities,

expected outcomes and assessment for learning, to be distributed to trainees before the video conference. Both video conferences, preliminary and actual VC3 ran successfully although due to a human error the technologies failed to record it. This meant that it could not be available for further use in the course as a useful teaching archive.



Figure 4.4: Snapshots of the VC3 taken at the university site: Trainees observe a Year Six class working in groups during their science lesson

4.1.3 Identifying the focus of the study

Planning and implementing the above described video conferences required constant and extensive negotiation with all involved participants. It was important to find a common time slot across the school and university's

timetable to implement live synchronous video conferences. Advance testing was undertaken as well as ongoing support with the technologies. For the purposes of this thesis, these are depicted as contextual factors for conducting technically 'effective' video conferences in a teacher education context (Comber et al., 2004). Overall, a few initial technical problems occurred during video conferences but these were not sufficient to disrupt the learning focus. Hence, this study goes beyond the scope of explicating how to implement 'successful' video conferences in a PGCE course.

4.2 Investigating the rationale of this study

This study is concerned with the pedagogical implications of video conferences after all contextual factors have been considered carefully and set in place, to allow teaching and learning to take place. In other words, the focus of the analysis is entirely on the teaching and learning aspects of the video conferencing experiences for all involved participants and more extensively for trainees. In-depth insights on how a number of trainees develop their pedagogical identities and learning were gathered to serve as a foundation and basis upon which the value of the technology was to be judged. The evidence of how the majority of trainees involved in this study became teachers was gained from transcribing the multi-point video conferences which took place between the trainees themselves, and from group interviews implemented for the evaluation of the possible pedagogical enhancement to the course by the

use of video conferences. Some of this evidence reveals the pedagogical rationale for this study, which is the subject of this section. What is explored is the perceptions of trainees on this particular PGCE course, and what might be their expressed concerns. Unless this is examined carefully it will not be possible to evaluate whether or where video-conferencing might address or have been seen to address any concerns that the trainees wished to discuss.

Most of the following sections open with or include in the analysis dialogue excerpts derived from the multi-point video conferences when trainees were on TEs or from interviews with the trainees, university tutors or experienced teachers, to illuminate the discussion and interpretation of the data.

4.2.1 A polarised position

E4 [Trainee]: And it's so black or white, at our time at the university you are just surrounded by other people going through similar things, it's very social, it's very chatty and then suddenly you are in a school

E3: Yes, I hate the first week [at schools]

E4: And all you see is children and mentors and that's it, and I was with T [a peer] who was in the same school [with me] and...

T: Yea, but we [peers] didn't really see each other'

[Group Interview A with trainees after TE2]

The evidence suggests that there existed, for some trainees, a polarised position. They were either physically at the university or on TEs, which, as the above indicates, could be experienced as quite different environments. Naturally, trainees were surrounded by different people at the university and in schools and went through different experiences. However, it was revealed that a number of them also experienced some changes in their social and emotional status. The practical support received at the university, and in schools was perceived as different because of the oppositional situations of presence and distance experienced at different phases on the course. Furthermore, it was reported by a number of trainees, when asked questions in regard to their emotional well-being, that there was a feeling of loneliness surrounding their school TEs, which was not experienced during their socially active times on campus. This was especially the case for those trainees who were posted in distant schools or lived far away from campus.

However, even in the case of having a few trainees posted in the same schools as illustrated in the above statement, some still felt isolated. The majority of trainees explained that the pressure of just getting through every day at school meant that there was little or no social time left to meet up to talk things through. This occurred even when socialising appeared possible, for example, when they already were good friends with some people on the course, or when they were at the same schools or lived close to each other. The majority of trainees claimed that they got home after a long day at school without really having the chance or time or energy to catch up with peers and friends.

In fact, a number of trainees illustratively claimed that it was like having their own '*TE bubbles*' at schools, because after some weeks on long-lasting TEs without really seeing each other, they lost the sense that they were on a course and that there were others out there going through similar experiences. Some trainees also reported that they felt they had lost '*that sort of link and a little bit of your life line and support*' when on TEs because they were separated from friends and peers. A trainee argued that, on occasion, this separation was so crucial for some that in combination with the pressure experienced at schools, led them to feel overwhelmed and even to failing the course or a TE. However, this was not the case for everyone. It seems that the course had been full of '*ups and downs*' for the majority of the trainees as they claimed in a number of interviews throughout the course.

Explicitly, a number of trainees who reported enjoying a TE or two at posted schools, felt sad to leave the schools to attend sessions at the university. Several trainees claimed that they wanted to really be in their schools, working with their pupils towards building a rapport. Some of them argued that at TEs had been predominately a case of standing '*on [their] own feet and just go with it*'. In contrast the university was a place where they engaged in discussions, learnt a certain amount of things, participated in activities, saw models of teaching and thought about children rather than being there to develop personal relationships.

A number of trainees talked about an existing inevitable gap in the course between the university and schools and between the theory and practice of becoming a teacher. From their perspective there were two elements on the course. One was university training, while the other was craft professionalism, a hands-on knowledge with which trainees had to familiarise themselves. This was because at schools knowledge is essentially put into a context, as shown in the following excerpt.

'C: [...] it's not the university's fault: it's theory and practice and there's a gap between the two

P: Yea and you [we trainees] need both so... [...]

J: [...] my two TE schools were completely different in the way that they do things so the university just tries to show a general overview but when you are in schools it could be quite different, so I'm not sure how they [university] could overcome that [the gap between theory and practice]'

[Group interview with trainees after VC3]

A different view was expressed by an English subject supplementary university tutor who explained, as illustrated in the following quote, that the 'how to teach' theory and the practice elements of 'how to teach' were blended in their training throughout the course; in other words theories of how to teach and examples of it. Also she seems to indicate that a distinction may lie between professional craft knowledge and subject knowledge that is the conversion of content knowledge for schools.

'T: [...] to get qualified teacher status, [trainees] have to show good professional practice and good subject knowledge because primary school teachers currently need good subject knowledge across all subjects [...]

[practical examples] that's integral, that goes without saying, that's what happens so when we looked at the listening activities [in a video] we looked at how the teacher was encouraging the children to separate sounds to listen carefully how the practice and the theory of how the children listen. So I can say definitely that is a part of this particular course, [they] are expected to do a mixed of practical and theoretical there'

[Interview with a supplementary English subject university tutor after VC2]

Still, a number of trainees who had a different perspective from that of the university tutor, reported that, on occasion they felt distant from what actually happens in a classroom during their training at the university whereas at other times, they acquired useful information and ideas at the university rather than skills they needed to teach a class. Also a number of them found difficulties at times in grasping the connection between what were taught with the actual local practice seen at schools and how to apply what was learnt at the university in practice:

'C: But I do think a lot of the time it's difficult to kind of relate what you are seeing in the university course to what you are actually going to be using so ...if you've got something you can relate it to, so if you're focusing on something for a couple of days...'

[Group Interview B with trainees after TE2]

Thus, it seems that a number of trainees alleged that there was a need, room and potential for improving and drawing further and better connections between their university and school learning experiences.

It should be underlined however, that the majority of the trainees and all university tutors considered both school and university experiences and learning as useful and essential parts of the course. Further, it is beyond the scope of this thesis to examine the extent to which there was a gap between university and schools' learning. Nonetheless, the course was practice-oriented, meaning that its purpose has not been for the trainees to '*predominately sit in a lecture room*' hence it was not an academic course from the perspective of a traditional university course. However, it was revealed that there was craft knowledge which involves practices and skills that trainees had to familiarise themselves with in practice, at schools and/or in connection with schools.

Specifically, a great number of trainees identified the importance of approaching and gaining some of the craft knowledge of teaching in actual practice. This had emerged by the trainees' discussions between themselves via multi-point video conference at which they discussed how important was for them, for building up their confidence in teaching, to take part in various activities, aligning with schools' ethos, traditions and routines, looking like a teacher, even wearing appropriate clothes and being '*on the right path*' for becoming good teachers. Enculturation into the profession and negotiation of

practices with experienced teachers at schools seemed to be the vehicle for the progression of the majority of trainees in the way they expressed themselves, their identities and understanding.

'K: Yes, you see I'm really worried about...I need to get in the teaching really to kind...to built me up and get experience because I know in applying for jobs as well, like at the moment I'm at the bottom of a really high hill

E: [Laughs] you are not alone!'

[Trainees' multi-point video conference on TE2]

However, as a consequence of the presence and distance situations in the course, the differences between the work required and learning occurred at the university and at schools discussed above, a number of trainees admitted feeling an 'uneasy' transition. One trainee expressed that *'it [was] hard to go from the university to a school, back to the university, back to a different school, back to the university and then to another school'* throughout the course. On the other hand, others thought that this process was powerful in the course because it enabled them to 'see', interact and gain craft knowledge alongside a number of experienced teachers, at different schools, in different locations. A number of trainees referred also to the ways they used university knowledge to inform their school practice during multi-point video conferences, in other words how the two, university and school learning 'come together' in the classroom. This issue will be discussed thoroughly in the next part of the chapter –the

process of becoming a teacher and the ways the video conferencing tools enhanced these processes.

4.3 The use of technological tools in the course

Video conferencing technologies were employed to explore their possible contribution to supporting trainees' learning from the university to schools and vice versa, whilst at the same time allowing diversity of experiences and understandings. The study explored whether video conferencing might play a role both in bridging craft knowledge of teaching with training, and in minimising distance by enhancing social presence for a number of trainees throughout the course.

It should be said that video conferencing technologies were explored as to whether they might bring together the two diverse but, as it was revealed, essentially overlapping elements of the course, rather than as an attempt to close any perceived 'divide' between the university and schools. There were two ways in which video conferencing was studied as a potential means of supporting and enhancing trainees' learning. First, real-time connections between the university learning CoP and the schools' CoP could perhaps be built, and secondly communication between members of the university community during TEs may be facilitated via video conferences. Which technological tools were integrated or used informally in the course for

facilitating trainees before the introduction of the video conferences, is the subject of the following section.

4.3.1 Technological practices already employed

'T (University tutor): On the whole English is delivered either in a lecture room where the students carry out various activities, or as yesterday they went out into school to observe lessons in progress, and these are the two main ways. We also use Blackboard [virtual learning environment] and that currently is an area where mainly information for the students and course material goes so that they can access it, and just lately we've been using wikis and blogs [online community tools] for the students to share information [...]'

[Interview with a supplementary English subject university tutor after VC2]

As the university tutor described the format of the course above, there were a number of ways through which the course brought together the two elements of the course (university and schools, training and craft knowledge) before the introduction of the video conferences. These were: through one-day visits at schools and on-site support at schools by university tutors and by using technologies including videos for looking at classroom examples, Blackboard, emails, and recently wikis and blogs were employed. However, it appears from her further evidence that Blackboard was mainly used by a number of trainees to access and receive useful lesson materials and information rather than to make their own contributions. Hence, Blackboard acquired an informational

rather than a communicative and discursive purpose. It was also revealed that wikis and blogs were employed in the English subject module for the trainees to work on projects cooperatively. However, at the time the study was conducted those were not perceived or used as routine practices in the course for every module and by every university tutor. Further, a trainee argues below that although it was good to be able to cooperate on a project with peers they also needed to just talk to each other freely whilst on TEs.

'L: [...] when we do group things [projects] on Blackboard like blogs and wikis whatever they are called, it's nice to work with everyone but it would be nice if there was some way that you could sort of say: 'I did this today [at school] and it was really good' and then get a response from someone'

[Group Interview with trainees after TE1]

In addition, pedagogical videos and DVDs were used in the course for looking at classroom examples. An English subject supplementary university tutor argued that she could watch a video beforehand and make a purposive-built session around a particular teaching practice, knowing exactly what to expect and how to guide the trainees during the actual university session. A number of trainees argued that with a video or a DVD they could watch and re-watch a case and focus in detail on something although some of them said they were aware that the materials could have been contrived, for example by a director.

Further, the use of emails seemed to be quite popular either formally or informally in the course. Some trainees mentioned that they used emails to elicit information from a university tutor on a task, their progress or a module and seek assistance by a university tutor in the context of the course. Also a number of them thought it useful to use emails to share useful lesson materials informally with peers, by generating an email distribution list. Hence, it seems that a number of them were enabled to share, retrieve and contribute materials, but again emails did not seem primarily to have a discursive purpose.

Other tools which were indicated by some trainees as a means to keep them personally connected, once close personal relationships were formed, had been telephone, and online instant messaging services for example MSN Messengers along with social gatherings at local pubs or over coffee. Interestingly, Facebook (one of the most popular social networking services) was mentioned by the majority of trainees as a tool used to communicate with each other informally, especially through its synchronous chat facility, although a trainee expressed his resentment over having to type.

Although it was not the purpose of this study to conduct an in-depth analysis of the role of various different technological tools used by the trainees, there was a need expressed by the majority of trainees to personally feel part of a group and to talk to each other on a regular basis. Thus, in cooperation with three university tutors this research study was carried out on the use of an additional

technological tool, video conferencing, which is a synchronous communicative technological tool to enable immediate sharing of experiences and interaction.

Multi-point video conferences as studied in this research project were thought, to enable sharing of experiences to occur throughout the course as an integral part of the course. Immediacy, authenticity, visual aid and the synchronous nature of communication, were seen as key features of video conferencing that would contribute towards the realisation of this goal. Evidence which reveals how a number of trainees initially start on the course and progressively became teachers is the focus of the next section aiming to foreground the role of the technology, which is central element of this investigation.

4.4 Questions of learning, identity, and transition for trainees: the role of multi-point video-conferencing

L [Trainee]: I think it was different this time [during TE1] because this is a pair TE

K: You've got someone [peer] with you

L: Yea, obviously you had some support from somebody who you knew but I can't say that it would be definitely like that when you'll be on your own [during TE2 and TE3] because you might not necessarily be in a school with anyone [peer]

K: That it might be quite lonely at times'

[Trainees' multi-point video conference on TE1]

A group of trainees, as shown above, reported that during TE1, they had been accompanied by their peers, their pair partners. In these paired groups they engaged in observing classes, enquiring teachers and pupils about learning and teaching processes, procedures, routine activities, strategies, shadowing experienced teachers and teaching incrementally over time either one-off lessons or a few plenaries each week. In fact, the majority of trainees argued that paired teaching provided them with much security and support, but expressed feelings of concern about upcoming TEs at which they would be left on their own. For this reason, early in the course, a number of trainees recognised the potential role that multi-point video conferences could play during their TEs and suggested inviting all trainees in the course to join in future video conferences. It seemed that there was an emergence of a 'university-based' learning community that would potentially facilitate them in the course.

In particular, as illustrated in the following quote, from the beginning of the course, a number of trainees recognized themselves as a heterogeneous group of people, having diverse background knowledge and sometimes different degrees, and similar or dissimilar needs, similar or different experiences. In the group interviews it was argued, by the majority of trainees, that they were a diverse group of people brought together with the common goal of becoming teachers. In fact, some of them reported that they were encouraged at the start of the course by their university tutors to invest in what they had in common, this common goal.

'K: Everyone has done some degree; some of us are older than others but [laughs], and I also think it is been pointed out at us it is not a competition there, we are all trying to work the same goal so we are quite happy to help one another'

[Group interview with trainees after TE1]

A number of trainees also reported experiencing an identity as university students (rather than as teachers) at the beginning of the course, which was even apparent at schools due to their lack of confidence in teaching and because they had been 'guests' in posted schools since they were staying for a short period of time at each school ranging from three to six weeks. It seems that for a number of trainees their common identity also brought them together. A number of trainees explained that, irrespective of any previous experiences they had at schools, they joined the course to learn and meet the demands of the university and of the schools. The following quote indicates how a trainee expressed herself and her initial identity on TE1.

'A : For me, when I was in TE1 I felt so much like a student and actually one of the children in Year 2 at the school was like: 'You're just a student aren't you?' and I was: 'How do you ever know how a student is like?' It's funny that they [children] are really aware and I [trainee] think it's because of [my] lack of confidence [...]'

[Group interview B with trainees after TE2]

The majority of trainees seemed to have been investing in their *temporal dimension of identity* that is according to Wenger (1998b) a constant process of

negotiating of one's identity and participating in practice in a temporal context. In this case, trainees participated in the teaching community to learn more, try out teaching ideas and continuously negotiate their identity as teachers. The temporal dimension of their identity as trainees was manifested in their talks during multi-point video conferences and was apparent in the comments they received from their university tutors, their mentor teachers and other experts, which again they shared during multi-point video conferences between themselves. It should be noted, though, that it was revealed that there was no universal prescribed path for everyone to follow in becoming a teacher.

'E3: I think I always thought about it [the course] like the first thing I read in the handbook; it sort of said: 'It's like an individual path', path is not the right word, like a course or something. You [the trainees] are coming in, in completely different stages and you get into different stages and it's like [...]

T: Journey

E3: Journey! That's the right word [...]

[Group interview A with trainees after TE2]

Evidence of the progressive changes on trainees' identities and learning throughout the course were derived from the discussions a number of trainees had with peers during multi-point video conferences and through group interviews after TEs and after remote classroom observations via video conferencing. This suggests that during the multi-point video conferences, a

number of trainees feel 'safe' to talk to each other, reflect and articulate the changes that happened to them as those happened.

On the whole, observation and mutual negotiation with experienced teachers in practice, discussions with peers, support and guidance by the university tutors and self-reflection, seemed to be some of the main ways through which the majority of trainees managed to see themselves in the role of the teachers. In the following section is an exploration of what specifically enabled access to the community of experienced teachers for the majority of trainees in order to experience a new identity as teachers, as revealed from the trainees' multi-point video conferences discourses and group interviews. Evidence on what video conferences added to this process will emerge from this analysis.

4.4.1 Participating peripherally in the community of Teachers

'E [Trainee]: No, L [peer] don't worry, I haven't done that much either. I've just done some mentor's starters all last week and some small group work and whatever and plenaries but I haven't done this week. I was meant to do lesson teaching but I'm not anywhere near getting, you know, a full day of teaching yet, I want to wait that little bit longer'

[Trainees' multi-point video conference on TE2]

A number of trainees admitted, as illustrated above, not being capable of doing or understanding everything at schools since there were things that seemed quite complicated or difficult, including a full day of teaching. This seems to present an element of *partiality* in their competences which is a term introduced by Wenger (1998b) underling the fact that members of a CoP, in this case trainees, who make an effort to join an existing CoP, do not necessarily need to try to know everything. Rather, it is preferable to develop an ability to connect successfully their competencies to the competencies of the other members, in this case of experienced teachers, to achieve their goals and pursue their work. A number of university tutors argued that as the trainees initially undertook some responsibilities peripherally in the profession they received considerable guidance and support. Further, evidence from the trainees' multi-point video conferences transcripts, including the following excerpt, revealed that a number of trainees engaged in observation, examination and discussion of everyday practices as well as actual practice. These are classified according to Wenger (1998b) as *legitimate peripheral participation activities*. The important role that teacher mentors played in '*building up*' trainees' confidence in teaching is revealed by providing them with basic guidance and lending a '*helping hand*' when they were under pressure.

'L2: ...So yea my teacher mentor is really nice as well and she did her PGCE at [university] 8 years ago as well and she just said you can try anything you want and I said: 'Oh I'll just try out, you know, watch you and try out, so I'll just get some experience' [Laughs]

E: That's right, I wasn't that confident going into this from my TE1 but after one day there and with her sort of mentoring I feel great, far more confident than I was beforehand that I wasn't quite sure'

[Trainees' multi-point video conference on TE2]

It appears that multi-point video conferences provided the opportunity for a number of trainees to share their experiences, compare 'notes' and reflect on their immediate observations and first lessons taught or about to be taught. These synchronous as-it-happens exchanges would have been difficult if not impossible without the use of multi-point video conferencing. For example, they were provided an opportunity to a number of trainees to discuss the various ways through which their teacher mentors provided them with the essential *legitimacy* needed to enter and influence the teaching practices. The majority of teacher mentors appeared to have given to the trainees '*space*' to try out their own things, make errors, take decisions, and reconsider practices.

The experienced teachers, teacher mentors and other experts at school with whom trainees were engaged actively in practice appeared to be their *paradigmatic trajectories* (Wenger, 1998b) which means 'living examples' of how to talk, act and engage in practice. They can also be called trajectories since for the majority of them their practices were not static but were also evolving and changing just like the trainees' practices. Although they seemed to represent the history of teaching practice embodied in their stories, advice, beliefs and values that they regularly shared with the trainees, they also sought

renewal of the profession. Consequently, a number of trainees argued both during multi-point video conferences and during interviews that they were welcomed at schools as new members who were vehicles of fresh ideas, agents of knowledge constructed at the university and unique personalities with their own styles. On the other hand, some of them were at times constrained to follow the schools' framework or the mentor's own practices.

In this process of becoming teachers and by the side of these paradigmatic trajectories of experienced teachers, the majority of trainees seemed to have engaged in adopting, adapting or modifying a *shared repertoire* of actions, resources, tools, tacit and explicit roles and regulations of the school community. This example of a pupil who corrects a trainee for calling maths '*numeracy*' demonstrates a school's community common language that the trainees have not yet fully familiarized themselves with.

E2: I've got one kid, you know, it's like having one extra TA [Teaching Assistant] in the room. If I'm unsure what we supposed to be doing I just ask him and he tells me

E3: Oh bless him!

E2: It's incredible I've never known a child so enthusiastic about anything and clever at the same time. He just gets excited by maths, science, English, anything, absolutely anything. He told me off for calling it numeracy the other day: 'Oh we call it maths Mr ...' I was like: 'Right, thank you'

E3: Oh bless him, just what you want'

[Trainees' multi-point video conference on TE2]

Data derived from trainees' discussions with their peers suggest that a number of trainees appreciated their mentors' contributions and grasped how central their role was in their learning for their enculturation in the profession. Thus, a number of them nurtured feelings of respect and appreciation for their mentors but also there were times when some trainees felt dissatisfied about something or disagreed on an issue that they could not discuss at schools. For this reason, within the community of peers via video conferences they appeared to share their thoughts, complaints, mistakes, and reasons for changing, modifying or keeping a teaching strategy the same, at the crucial times when decisions were taken.

Hence, it seems that with video conferences a continuous circle of action (engagement-in-practice), reflection, peer feedback, guidance by experts and again action occurred. Whereas if the trainees had waited to report their experiences when a TE was over and reflect retrospectively, they would have missed the opportunity to engage again in practice in the same context trying a new idea, strategy or approach and commence the circle of action-reflection-feedback-action once more. Self-reflection, reflection with peers and peer feedback were mainly added in the process of becoming a teacher for a number of trainees through multi-point video conferences. What held the

university community together internally as personal progressive changes in their learning and identity occurred is discussed in the following sub-section.

4.4.2 Sustaining a university community

'L [Trainee]: I think we've got great like peer relationships

K: I think that we've got a support network ...when I'm having a bad day I can call anyone of these guys and say: 'Oh my God this happened, I'm quitting'

J: 'I hate teaching' [Laughs]

L: I felt so down and I just thought, last night, I didn't see that happened and I called someone [a peer] and told me: 'Oh I've been there, don't worry, I did that' you know that really, really helps.

T: Yea, I think it's good talking to each other'

[Group interview A with trainees after TE2]

As shown above a number of trainees regarded subgroups of peers as their own personal support network. A nexus of relationships seemed to have been generated between a number of them although the large number of people enrolled in the course meant that they could never meet everyone. However, a great number of trainees reported in group interviews that if they felt being stressed or anxious about something related to the course, they could share this with each other since they felt as co-workers. In group interviews, the

majority of trainees claimed that since they were all working towards the same goal, they wanted to know how everyone was doing and how they cope at schools. This is because they seemed to have their own everyday routines that they somehow shared - going out to schools, getting prepared for the next day at school, going to the library and completing tasks. The characteristic phrase of *'same old'* used in the following multi-point video conferencing discourse gives the impression that they knew what each other was going through, however there were *'ups and downs'* in their learning and progress that they needed to share regularly.

'A2: How is everyone else [peers] getting on? Do you know if everyone else is alright?

L2: Yea! I saw E3 [peer] at the weekend and then I saw J [peer] and M [peer] in the library and they all sort of be doing OK and I saw T [peer] a few times she is alright I think, 'same old'

[Trainees' multi-point video conference on TE3]

Multi-point video conferences appeared to be one of the ways through which a number of trainees were enabled to enquire from and inform one another on their progress. In this way the dynamics of the university community were expanded when they were in dispersal, in different schools. Although the majority of trainees reported in group interviews that it was helpful to know that they were all together, a trainee admitted that she was scared to watch their peers' progress not to compete but to compare out of fear of being left behind.

For this reason she 'stepped back' from the multi-point video conferences because she did not want to get overwhelmed by others' successes whereas she was experiencing difficulties in building up her own confidence in teaching.

'T: I am exactly the same, yea, especially during this TE I thought: 'Jesus this is a lot'

K: That's what I got out of the video conferencing because I knew where you [peers] where and I didn't feel so alone

E3, J (in chorus): Yea!

L: I kind of back up a little bit because I felt a little bit overwhelmed with all of these panics and because I didn't want to start comparing my experiences to everybody's else because I was worried that everybody else would be positive and...'

[Group interview A with trainees after TE2]

The response to the opportunity presented by videoconferencing was dependent on the personal character of each trainee, as illustrated in the above interview excerpt. Some felt empowered by knowing where their peers where and others felt intimidated.

Another aspect of their community that seemed to bring together the majority of trainees was the *shared repertoire of practice*, which according to Wenger (1998b) is a constituent element of any CoP. This emerged through the multi-point video conferences during which most of trainees found it useful to share

tips and information related to the course, assignments and tasks they had to do as well as useful online resources, teaching ideas and materials to assist them at schools. They also seemed to acquire their own *artefacts* as Wenger (1998b) introduced them including lesson planning sheets, assessment sheets, tracking grids provided by the university as a structure for their lessons. As is revealed from video conferences, even when some trainees expressed at times objections on the use of some of those *artefacts* or practices they were encouraged by each other to adopt them in their learning or pursue the practices in order to be part of the university community and be efficient in the course. At other times, they discussed how they developed their own strategies to cope with the demands of the university and those were usefully shared.

'E: I'm using the university's one [lesson planning sheet] at the minute and that's OK but I've seen other ones which are much better but I don't have hard copies

P: I'll send you the one that I've been using. It's just a lot more straightforward I think and a lot more sensible'

[Trainees' multi-point video conference on TE2]

The analysis of the multi-point video conferences transcripts also reveals that trainees were sharing a common pedagogical language including such terms as formative assessment, behavioural management and PDP (Professional Development Portfolio), which to an external participant would have needed a number of explanations in order to engage in their discourses. Hence, it

appears that the majority of trainees somehow knew what mattered to them the most, what was important and useful to share and what was unnecessary or insignificant. Thus, a number of them shared how they completed some tasks, what annoyed them, what they liked or disliked in the course, how they thought it might be done better, and their own ways of getting everything done, during multi-point video conferences.

It seems that although learning was more intensified and explicit during taught lessons at the university, it also took place informally and naturally within their CoP in the boundaries of their course. Although a number of trainees had said that they acted as resources for each other and interacted with each other at the university and in schools, a university tutor argued that trainees' relationship could not develop into a professional level of a CoP. She argued that a CoP is formed amongst people who seek to get together and pursue work together. However, she claimed, the peer community remained at the level of a personal communication network. It was shown that this perspective had not been entirely supported by the data. In fact evidence discussed so far in this section derived from multi-point video conferences and group interviews shows the opposite, as can be seen in the Figure 4.5 representing the constituent elements of their CoP.

A number of trainees appeared to be members of a group who acquired a common goal that brought them together irrespective of any differences or

similarities in their abilities, background knowledge or their various different starting points. Nonetheless, the majority of them seemed to start with an identity as students (trainees) which was temporal and ongoing thus soon in the course began to acquire a developing identity as teachers. They had a shared repertoire of practice including their own practices, language and artefacts. The majority of them developed supporting relationships and while there was some evidence of competitive relationships among a minority, on the whole, the trainee community was characterised by their mutual engagement in facilitating each other's progress towards becoming teachers.

How the two identities, as students and an emerging identity as teachers were blended together in the course is the subject of the following section.

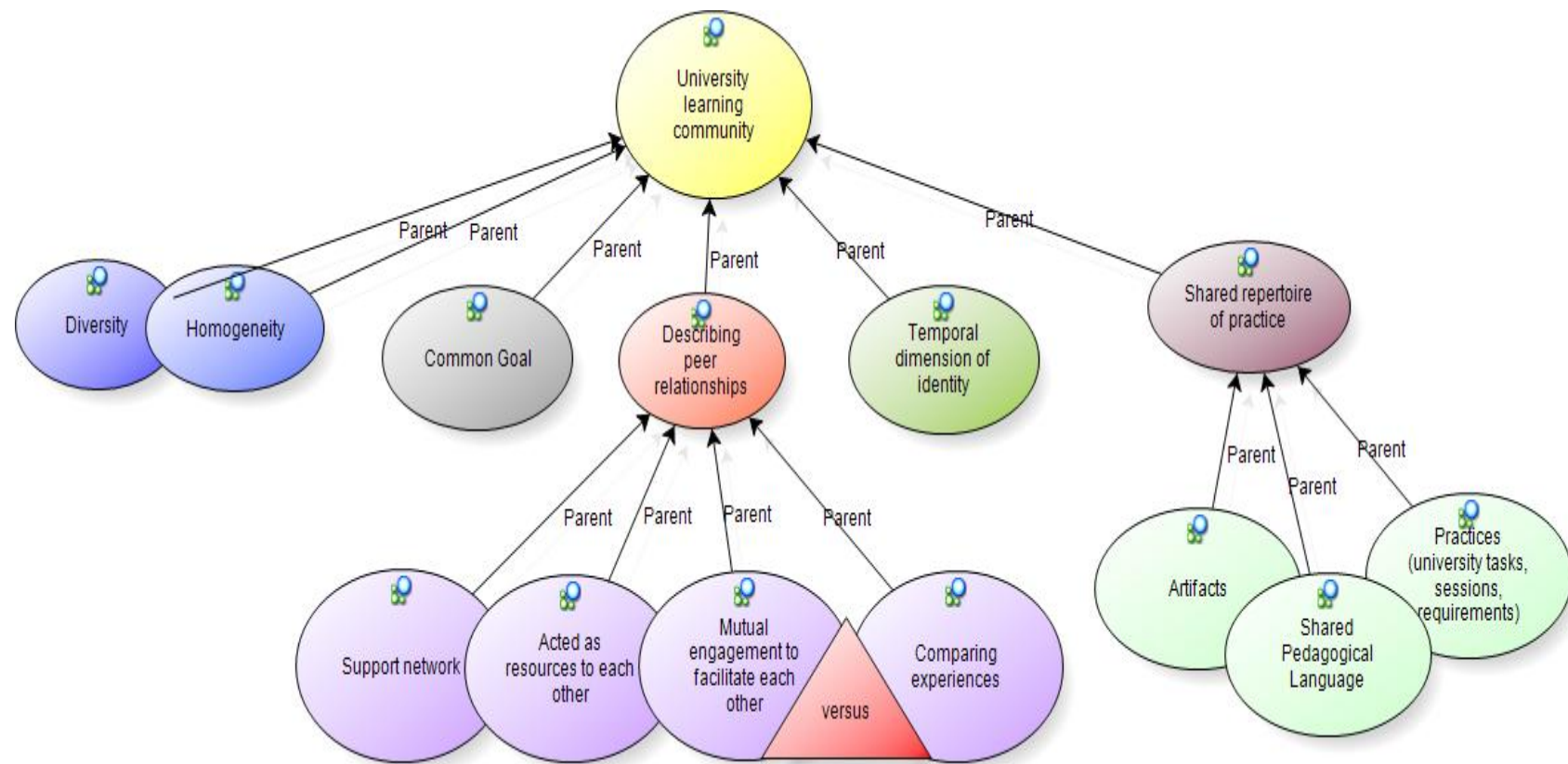


Figure 4.5: Constituent elements of the trainees' university community

4.4.3 Experiencing a twin identity

'L [Trainee]: You don't have the time [to do tasks] I think when you are in TE2, because either they should leave you to it and say: 'You are going to teach, go and do all that you have to do' because I think I had it in my reflections...

E3: You've got enough to do

K: You've got all the roles of the teacher and then you've got all the tasks you have to do as a student'

[Group interview A with trainees after TE2]

The majority of trainees, as illustrated by this excerpt, explained that their goal during the course was perceived as twofold; to complete the course tasks as students and to fulfil their roles as teachers. This twofold nature of the demands had not been easy to accomplish at times. As has already revealed in this chapter, the majority of trainees began with an identity as students and then experienced a new identity as teachers. It seems that trainees experienced their identities in practice as a *learning trajectory*, a term originally used by Wenger (1998b) for the people who define their identities by where they have been and where they are going, in this case from the university community to the community of teachers. Thus, most of the trainees seemed to reside in *inbound trajectories* (moving towards membership of a CoP) as they could realise some progress in their learning from students to teachers and were looking forward to becoming full members of the teaching

community and be within a school community for a long period of time, and pursue their own ways of doing things. Hence, during the multi-point video conferences a number of trainees talked about how different it would be having their own classes, being a professional teacher from being a trainee. On the other hand, trainees also knew that some of their peers were not heading into the community of teachers, in other words they are in danger to fail a TE or the course. At times some trainees during multi-point video conferences referred to those people they knew who left the course, and they sought reassurance and encouragement from one another that they were doing fine.

'L: On Sunday I think just because I got bit down and it was taking me forever I sort felt, I don't know, I can't plan a whole week of lessons and worrying about moving up but I don't know I feel like I have a really positive week and I really do enjoy the teaching side of it and my mentor is really helpful so I don't know, there are ups and downs [Smile]

E: Once you get into, I am hoping that once you get into teaching then it should take a life of its own, the more you do the more confidence you get and then the easier it gets on the planning, that's my opinion'

[Trainees' multi-point video conference on TE2]

The characteristic phrase *'there are ups and downs'* with which a number of trainees described their experience in the course reveals a number of bi-directional movements, of moving in and out of the two communities before

becoming a teacher due to the trainees' *nexus of multimembership* in two CoP, learning university CoP and professional school CoP of teachers. By the end of the TE2, most of the trainees in group interviews, as illustrated below, mainly manifested their identities as teachers and a few others in another interview as trainees; but there had been a shift in their identity over time and more work had to be done after TE2, encapsulated in the phrase '*still a long way to go*'.

'Researcher: How would you define your identities?

T: More like teachers

Trainees in chorus: Yea!

K: Yea, still a long way to go but at least now the kids [...] respond but that's possibly because I'm not just a stranger in the classroom, after a couple of days I wasn't going anywhere [...]

[Group interview A with trainees after TE2]

It was, thus, revealed that a number of trainees defined their identity by the ways they themselves gained *experience in practice* through participation in schools and those perceptions were usefully shared with peers via multi-point video conference. For example the trainee above boosted her confidence in teaching once her pupils responded to her instructions in the classroom. At the same time, it appears that a number of trainees were also influenced by the various ways that significant others including experienced teachers and the university tutors defined their identities 'for them'.

Several implicit clues, written or oral remarks and feedback received from the university tutors or experience teachers, as well as official assessments of the university, seemed to contribute to how they perceived their level of competence and identities. For example, for some trainees, their teacher mentor's confidence in their competency to teach alone in the classroom engendered positive feelings regarding their perceived competence as teachers. Wenger (1998b: 150) defines some of these as *official markers of transition* which in this case mean levels that trainees had to pass progressively over the course, including three blocks of TEs. Within peer communities, personal comments received from university tutors and mentor teachers were shared along with any feelings of concerns, satisfaction or dissatisfaction. In effect, a number of trainees seemed to have come to perceive their identities and better understand their roles by their conversations with peers via multi-point video conferencing.

Overall, the analysis of the trainees' informal discourses during all seventeen multi-point video conferences on TEs and the analysis of trainees' group interviews revealed that trainees had been *feeling, thinking, talking like students* as much as they had been *feeling, thinking, talking like teachers*. First, at which stages on the course these identities were developed for the majority of the trainees was also interesting to explore. The following graphical display, Figure 4.6, produced in NVivo enhanced further the construction of the analysis by linking together the themes (codes): *feeling-thinking-talking*

like students and *feeling-thinking-talking like teachers* and retrieving them in combination with their sources.

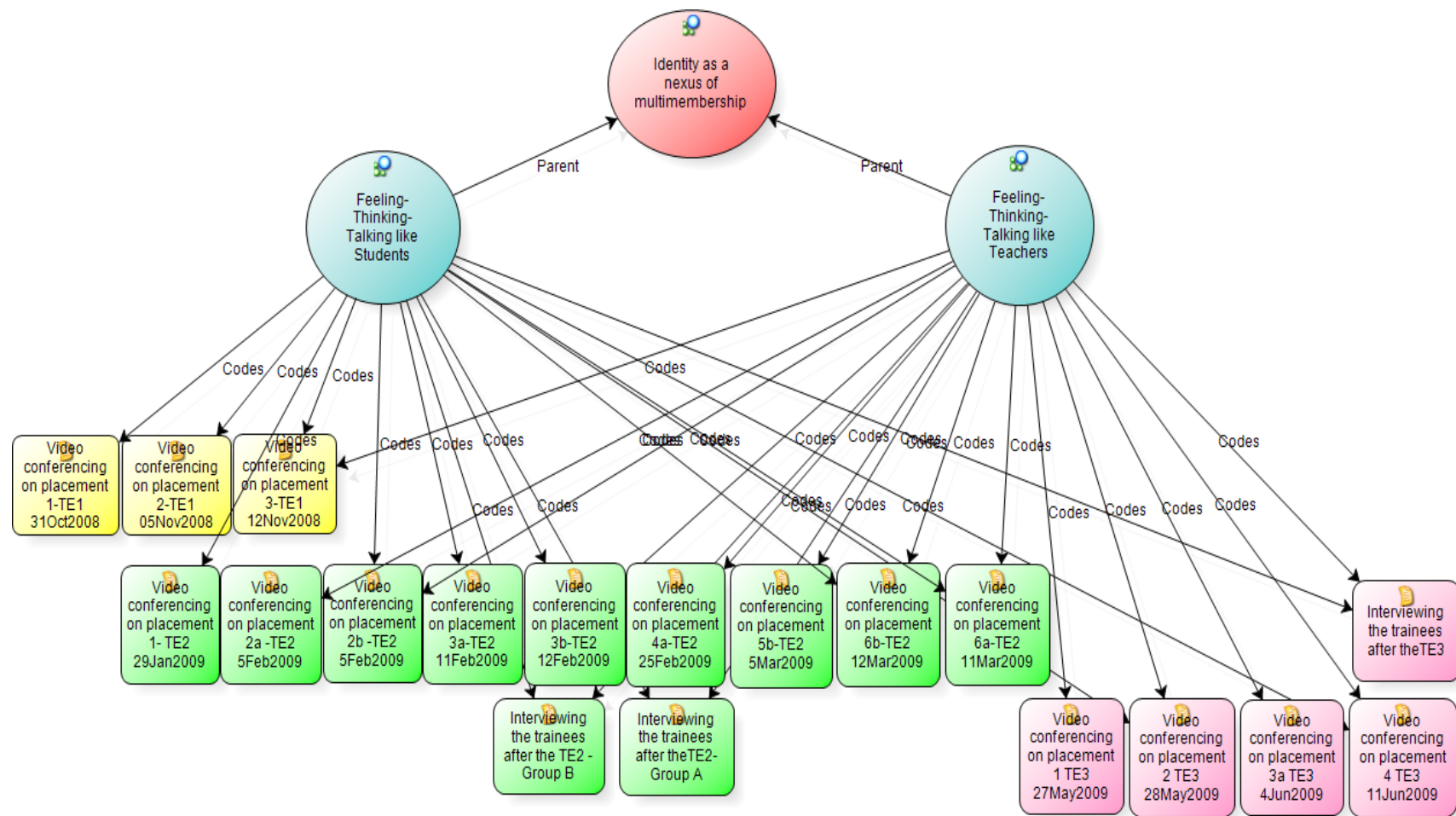


Figure 4.6: A picture of the analytic framework developed relating to the two aspects of the trainees' identity, as students and teachers, throughout the course

The sources were placed in a chronological order in order to present the distribution of evidence throughout the nine months PGCE course. In other words, the two themes were traced back to the source indicating the date of the multi-point video conference or group interview to enable drawing conclusions at which stages in the course their perceived identities occurred.

Explicitly, following the arrows directed from the theme *feeling-thinking-talking like students* to its sources shows that the trainees' identity as students was apparent from the beginning of the course (VC1 in TE1 – in October) and was maintained until the end of the course (VC4 in TE3 – in June). It should be noted that this appears to signify a process for a number of trainees rather than a universal truth for everyone. For the majority of trainees their identity as students was revealed mostly during TE1 (sources in yellow) and again during TE3 (pink) because of the great amount of work that had to be done to reach the professional standards and required tests in order to be awarded QTS. However, it was not so apparent during TE2 (green) since the majority of trainees seemed to be more focused in their role as teachers as is revealed from their peer discourses.

In effect, following the arrows directed from the theme *feeling-thinking-talking like teachers* to its sources it appears that the trainees' teaching identity had commenced for some trainees by the end of TE1 (VC3 in TE1 –in November) and for others during TE2 (VC2 in TE2 –in February) and endured until the end

of the course (VC4 in TE3 – in June). Cross-checking the data, a university tutor argued that trainees' transition to teachers had been met for the majority of trainees before the end of TE2. The following interview excerpt is a clear indication of the university tutor's view.

'S: At the moment I think they have made the transition to thinking of themselves as teachers because they wanted to know how the lesson is planned, they wanted to know about the children's learning. So at this stage they are operating as teachers who will have classes of their own in about two weeks time, three weeks time... and the discourse was definitely professional'

[Interview with a Science subject tutor after VC3]

Moreover, the majority of trainees, during multi-point video conferences on TE2 and in group interviews were talking about how they had realised their learning transition from students to teachers and needed to establish their identities as teachers, as shown in the following excerpt. The trainees' responsibilities at schools increased during TE2 and TE3 since they were teaching for the long period of six and seven weeks respectively at schools.

'A: [...] my mentors in TE2 they were saying how much I've changed and I need to see myself in the role of the teacher...I've really felt like... at the beginning I had an amazing mentor. I felt a bit intimidated but by the end of it I felt empowered though. I felt like a fellow teacher which I didn't have it at the beginning at all'

E2: No, I think you have to establish yourself as a teacher so [...]

[Group interview B with trainees after TE2]

In their discussions and in group interviews a number of trainees stated that sometimes this coexistence of identities enhanced their experience throughout the course, while at other times resulted in conflict. Hence a number of them appeared to be in search for finding ways to balance their two identities, known by Wenger (1998b) as *work of reconciliation*, by orchestrating their various enterprises. The following figure, 4.7 presents graphically how a number of trainees experienced their identities. These findings were a central issue affecting the research questions and the rationale of this study. The emerging issue was to explore whether peer CoP and remote classroom observations enabled via video conferencing assisted trainees to employ techniques to balance their two aspects of identity and achieve the goal of their learning trajectories: to eventually become teachers.

The next section moves on with a consideration of the constant struggles and successful resolutions experienced by a number of trainees. The role of multi-point video conferences will also emerge from this discussion.

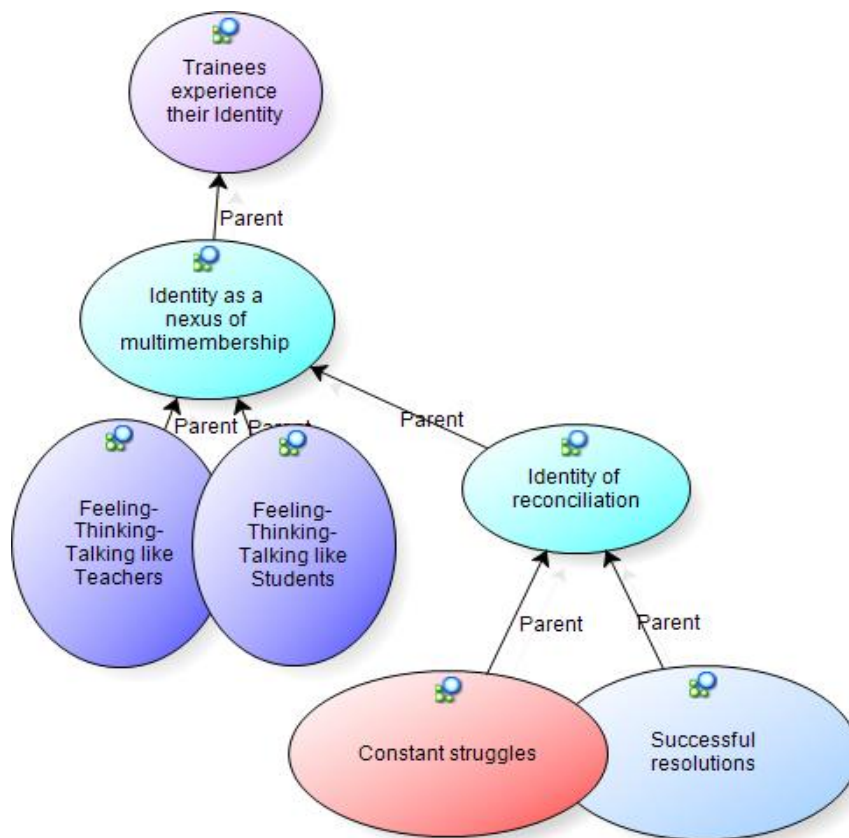


Figure 4.7: Identity as a nexus of multimembership in two communities that sometimes enhance one another and other times present a challenge

4.4.4 Constant struggles Versus Successful Resolutions between the twin identities

'J [Trainee]: It kind of conflicts sometimes because if the child doesn't understand you're meant to think about the child because you are a teacher, you are their teacher, you are not going to think about your own professional development, I know that you have to think about it at the same time but the point is, that the child comes first. I'm not going to drop what the child is learning, one, two or three, because I have to do a

[...] task. It's much more important for me as a teacher to get that child where it has to be and that's the way the school feels as well.'

[Group interview A with trainees after TE2]

In a group interview conducted at the end of TE2, a trainee admits that during TEs her teaching identity ought to prevail over her student identity on various occasions. It reveals that finding ways to establish their teaching identity in action at schools and balance their identities as students and teachers in successful resolutions had been intuitively discussed during multi-point video conferences by a number of trainees. An example provided here illustrates that whilst a trainee had developed a sense of belonging to the teaching community during the last TE, a number of unmet requirements of the course had to be addressed in order to fulfil the role of an 'efficient' teacher in terms of the university requirements.

'E2: Yes I can teach, it's just the paper work I struggle with. The kids enjoy the lessons. For me that's the most important thing, that the kids enjoy the lesson and they are interested because I try to make it fun but I just have to do the boring stuff as well, you know and try and record who is actually learning what'

[Trainees' multi-point video conference on TE3]

Also it emerged that a number of trainees found the opportunity to share with peers via multi-point video conferences the various reasons they thought some

university tasks and requirements incompatible with facets of training in TEs. These included the school they were at, the year group assigned to them, irrelevant to what the pupils were learning at the time or/and irrelevant to the pupils' level of understanding. On the other hand, in other times, those university tasks and requirements fitted perfectly and were directly related and applicable in actual teaching practice. Consistent with one trainee's view, '*some [of the things we learnt at the university] are the same [as what we learnt at schools], some cross-over*'. In fact, some of the knowledge and ideas gained at the university led to innovative practices, which means new practices, interesting lessons and in-depth study of pedagogical issues.

It appears that in any case, in conflicts or in successful resolutions, multi-point video conferences played a role due to their synchronous nature that allowed immediate exchanges among peers. Explicitly, when a number of trainees faced some conflicts, they could either negotiate the meaning of some tasks and seek advice for their applicability in practice within peer discourse, or confess to being unwilling to complete a university task and feel that they were not alone on this. In this way, a number of them also exchanged information and shared their own ways of pursuing what needed to be done. This included discussing ways to modify tasks, accommodate changes in real situations, take initiatives, prioritise, and organise their time effectively, thereby reducing stress.

On the other hand, when successful resolutions were realised those were usefully shared among peers to assist them in growing as teachers because in this way they were 'making sense' of the university experience and learning in the context of school and classroom practice. The following excerpt supports this idea as two trainees were drawing connections between what a university tutor had said to them in a session and what they had seen in practice. In fact the following excerpt reveals peers' critical evaluation and reflection on their experiences enabled via video conferencing.

'E3: ...You know, you can't move the kids on, until they've got the first thing, you know, there's no point until, you know, they can add, subtract, multiply and divide. What's the point of moving them on if they can't do one of these things? Very strange

J: I completely agree, it doesn't really make any sense. That's what [university tutor] was talking about, making children hate maths because they don't have a clue what actually is going on and then they're feeling stupid

E3: Exactly'

[Trainees' multi-point video conference on TE2]

It should be noted that it what emerged from the data was that those challenges and resolutions can be seen as dualities, a concept introduced by Wenger (1998b), since a situation may have produced both a struggle and a resolution depending on trainees' feelings or other situational factors as illustrated here.

'P: Well, [...] what I was going to do for [maths specialism], I kind of step back from and I'm really still thinking about it

L: It's kind of difficult because it depends on the school and your class and circumstances that completely change your mind.'

[Trainees' multi-point video conference on TE2]

Some of challenges faced by the trainees over the course were:

- the applicability and compatibility of the university demands in real teaching practice, which was discussed above
- balancing the time needed to fulfil the multiple responsibilities of the teaching profession against the time needed to complete university tasks.
- the current pedagogical trends taught at the university versus schools' already established practices
- satisfying the prescribed requirements of the course in practice at schools
- balancing the mentors' training agenda and university demands

On the other hand, data appeared to show that successful resolutions between the two 'worlds' occurred when:

- the modules taught at the course led the trainees to achieve unique, indigenous, new practices at the schools
- the university tasks and demands provided a pedagogical focus on TEs
- the knowledge acquired at the course informed and enhanced the trainees' teaching practices
- the course provided support and ideas to enrich trainees' teaching practices
- when trainees managed to successfully negotiate their own identities in schools.

Explicitly, another 'conflicting' area revealed from the data was the time spent in implementing the university requirements and tasks, versus the time dedicated to teaching. The data appear to show that trainees had to develop various strategies to manage their time effectively and get organised to hand in assignments and fulfil all their teaching roles. On the other hand, a number of

tasks were considered useful and beneficial both for the trainees and the pupils at schools even though trainees had to find the time to pursue them.

'K: [...] I'm not getting really any tasks done because I'm literally trying to plan every lesson that I can and evaluate it and then it's difficult to do anything in between

L: I know, it's too difficult isn't it?'

[Trainees' multi-point video conference on TE2]

'L: I will say though that I'm glad that they made me do a phonics sessions because I had a year five class so I could have not bothered with it whatsoever, but I took two kids who were dyslexic out of the class and I just did a session with them and they were doing this really, really boring sort of tapes and filled sheets for phonics and they didn't like it and it was boring and it was babyish as well, and so I did a session with them and we did like a funny spot story and stuff like that and they really enjoyed it and said they've learnt so much more from this and I wasn't going to bother with it unless there was a task on it that was positive but that was really it'

[Group interview A with trainees after TE2]

Another duality discussed during multi-point video conferences as shown in the following excerpt had been in regard to their community's artefacts. Explicitly, some trainees argued that a number of rigid requirements of the course including keeping structured paper-based records rather than electronic-based evidence of teaching or detailed lesson which sometimes mismatched with the personal evolving teaching styles of each trainee was seen as an extra burden. On the other hand, other trainees found those to be valuable, supportive tools and structured ways to direct their learning on TEs.

'P: How I would work naturally I think I would work with short bullet points of a. b. c. but for the purposes of this course you end up having to fill in far more than that and I think that this is not useful because I end up doing detailed plans that I can't read the [...] thing when I'm in the classroom

L: Yea, I think that's individual to the person because at the moment I'm finding my detailed plans really useful to think about what the learning objective is and how I'm carrying that out throughout the lesson so I feel like I need the support and preparing for the lesson to go through that detailed process'

[Trainees' multi-point video conference on TE2]

In addition, a number of trainees argued that some current pedagogical trends or ideas for music lesson, maths, history, English, citizenship subjects taught at

the university for example letters and sounds phonics programme, ICT integration in subjects were not seen in practice since some schools were following already established practices or specific pre-planned strategies for example English as an Additional Language (EAL) school.

'J: My mentor was very good but she was really scared of the technologies; she is the one who doesn't really know how to use the interactive whiteboard and she showed me what she knew and then she let me to it and she was really surprised when I actually got a digital camera attached to the compute ...She was really open to learning new bits and she also let me moving the children around, some of them, I was quite lucky because she did give me a free range to try my one things... some of them were working and some don't'

[Trainees' multi-point video conference on TE2]

Some of them also expressed their disagreement on a range of different teaching methods, pedagogical schemes, tools or approaches that they observed or had to follow at the posted schools since they personally found them to be ineffective for the pupils' learning. As the university encouraged trainees to become critical and reflective teachers, this was especially enabled within communities of peers via video conferencing as it served as a virtual 'place' where a number of trainees could develop their arguments, express their thoughts freely and be critical about anything they could not say at schools. On

the other hand however, the trainees realised that all the diverse practical experiences and craft knowledge gained at different schools could not be gained through taught lessons.

‘T: We can try and implement some of the things we’ve been taught but some schools are resistant to change with new ideas. I know that what the university teach us are new things, current trends, current practice like we’ve been taught letters and sounds, you know some schools have never heard of letters and sounds you can try and implement it without being too pushy, and if you implement it in your own lesson when you have your own class to try and if it takes off, you have to be careful’

[Group interview with trainees after VC3]

By the end of the course, the majority of trainees felt that they had grown professionally and were able to deliver and evaluate lessons, mark children’s work, give detentions or awards, and overall had acquired full participation in the teaching profession. Their inbound trajectory referred to their movement towards the teacher CoP has led by the end of the course to an *outbound learning trajectory* referring to them gradually moving *out* of the trainee CoP; in other words they were leaving the latter entering the former. According to Wenger (1998b) it was important how a form of participation, in this case in the trainees’ CoP enabled what came next, that was their inclusion in the teaching CoP. The words of the trainee below are illustrative of this inclusion.

'E2: Well I said to, I just had a tutorial with [university tutor] and you are realising in the TE3 how little you have to do in the first, and how easy the second was really because the third it is more or less the case: 'Right, every little job its yours' from let's say homework to achievement awards, rewarding the kids, going on trips, playground duties and say you kind of go from being a trainee to a teacher [...]'

[Group interview with trainees after TE3]

The focus will now turn on the very specific role that video conferences on TEs were said to have played, in moving from one community to another. These judgements are as seen through the eyes of a number of trainees.

4.5 The value of the multi-point video conferences on TEs: the views of participants, and analysis of their development over time

This section gathers systematically all the research evidence from the trainees' group interviews on how video conferences empowered a number of them to successively progress towards becoming teachers. In an earlier discussion of the aspect of identity of the trainees as students, data reveal that communities of trainees exist either with or without the video conferences; what seems to be added with video conferences is the focus of this sub-section. Firstly an

overview of the range of discussion themes which emerged during trainees' online meetings is presented.

4.5.1 Discussion themes

'Researcher: What did you talk about [during multi-point video conferences]? [...]

K: Stories of like what happened to us in the class, strategies, the tasks

E3: How we are finding it...

K: Yea. Jobs we started talking about it once, Fridays out, going out

J: Counting down days

L: Particular lessons, strategies

E3: Who dropped out was another conversation

J: Gossip, general chit chat

E3: Everything

J: And it was free as well because we couldn't have done that. We could have done it down to the pub but...

T: It would have cost us the drinking [laughs]

E3: Yea, it was a good way meeting up without to make too much of effort. I wore my pyjamas most of the times and started talking so that was nice.

[Group interview A with trainees after TE2]

The peer discourses in multi-point video conferences, as listed above, appeared to be informal, among friends but mostly focused on professional issues and with a fine boundary between students' and teachers' talk. It was also revealed that both the sharing of school experiences and talking about university tasks were blended in their discussions in equal and mutual ways. The synchronous nature of video conferencing allowed a number of trainees to see, talk to their peers and give and receive support from one another by simply using their laptops and web cameras to connect with one another from the comfort of their home. This was achieved without any costs or need for travelling also emerged from the above excerpt.

The analysis of the developing discourses as the majority of trainees progressed from early TEs to later ones, in terms of the focus of their discussions over time, was thought to be an interesting theme to explore. Hence, it was revealed that a number of trainees' early stage concerns had been associated with developing an understanding of what was expected from them, how they would cope with the course requirements and how they would be personally affected. Nonetheless, it is argued in this chapter that at the beginning of the course the majority of trainees felt and talked more like students rather than later on the course. It thus seems that a great number of questions on how to meet the university requirements were solved amongst a number of trainees via multi-point video conferences primarily during TE1. These included writing personal and weekly reviews, sorting folders, implementing tasks and assignments and filling assessment sheets. Topics

also included which tasks they had done and which not, what was difficult and what was easy or interesting and how long did it take, attending taught sessions, sign-posting each other on completing a task by providing instruction, suggesting web links or books, providing clues or ideas.

Hence, during the TE1 a number of trainees focused more on discussing how to proceed according to the booklet, handing in their university assignments and accomplishing tasks at schools. Only when they seemed to have embraced that did they begin to look outwards, towards their pupils' needs because they had begun to grow in confidence in their role as teachers. This was a stage when a number of trainees were mostly engaged in talking about the outcomes of their lessons in regard to their pupils' expression of interest and learning progress, following what they had learned, understood or been told at the university or at schools.

However, as was discussed earlier in this chapter, the process of becoming a teacher did not seem linear for the majority of trainees and was not predefined or identical for everyone. In this process a number of trainees throughout the course but particularly at the beginning of TE2 happened to experience a number of worries, troubles and fears which they shared among peers via multi-point video conferences. They expressed worries about not finding their feet in the classroom yet, being at the bottom of a really high hill, not being able to

meet the demands of some university tasks, juggling everything in both university and school, and struggling with differentiation and planning.

In all three TEs the majority of trainees shared their immediate school experiences, funny incidents, developing relationships with teacher mentors, pupils and staff in schools, feelings and thoughts about their school, their classes and themselves as teachers including motivating children, feeling a horrible or beloved teacher. Thus, some of them were engaged in reflecting on their weak points and their strengths as teachers as those were perceived in practice and those were shared with peers. Lesson planning and preparation for next day at school also seemed to be an important issue for discussion in all three TEs. In each video conference, trainees were asking each other what lessons would they teach, how they would go about it and why, and where they would get all their resources.

Over time a number of trainees started to seem confident enough to experiment with using their own ideas at schools and those were also usefully shared. Essentially what emerged from this analysis is that as the trainees become more confident, they moved from discussing themselves, their adequacy and competencies in teaching towards greater confidence, feeling in control and finally to having the confidence to try things out. This has echoes of the Concerns Based Adoption Model (CBAM) structure of progressive 'stages of concern' of Hord et al. (1987) with respect to educational innovation - adapted

in this case on how a number of trainees learning their craft in the teaching profession. The 'stages of concern' model reflects different stages of teacher development encapsulated in the kind of questions teachers' ask when experiencing change (Hord et al., 1987). Teachers move from self-oriented to task-oriented questions and finally they look outwards and focus on impact and on peer collaboration (Hord et al., 1987). In effect, a community of trainees enabled via video conference, appeared to be a place for collaboration with peers, exchanging interesting ideas, innovative lesson plans and everyday activities.

Also as they grow in confidence, particularly during the TE3 a great number of trainees began to talk about future plans, applying for a job. For the trainees, this involved going out on interviews therefore they needed to share their experiences with peers, also offering some tips for following interviews and their feelings; whereas others were complaining about not having the time to fit that in as well whilst being on TEs and others were not confident enough to apply for a job just yet. It was reported by some trainees that this process entailed demonstrating a level of confidence that they were on the way to getting awarded the QTS. Peer discourses via video conference seemed to afford a supportive environment for trainees to share their decisions, dilemmas, disappointments and anxieties.

As emerges from this analysis of multi-point video conferences, they served a range of functions: professional and personal but also social which all seemed to be important and, were all characteristics of their CoP. Socialisation chat within multi-point video conferencing was around everything the trainees themselves would like to say to one another and were light interludes in talking about university demands and school experiences. A number of trainees tried to have some fun as well as being part of a support network to assist them in meeting their goals. Making social arrangements including going out to parties, planning nights out and meeting up took place frequently via video conferences. In addition, they shared personal information including arrangements for special occasions like a trainee's forthcoming wedding (showing the tiara over the web camera, for instance). The importance of visual element of the technologies in creating a social presence effect for a group of trainees whilst being apart was thus also revealed.

The graphic below, Figure 4.8 aims to summarise the themes which emerged within their peer community as those were coded from the raw data.

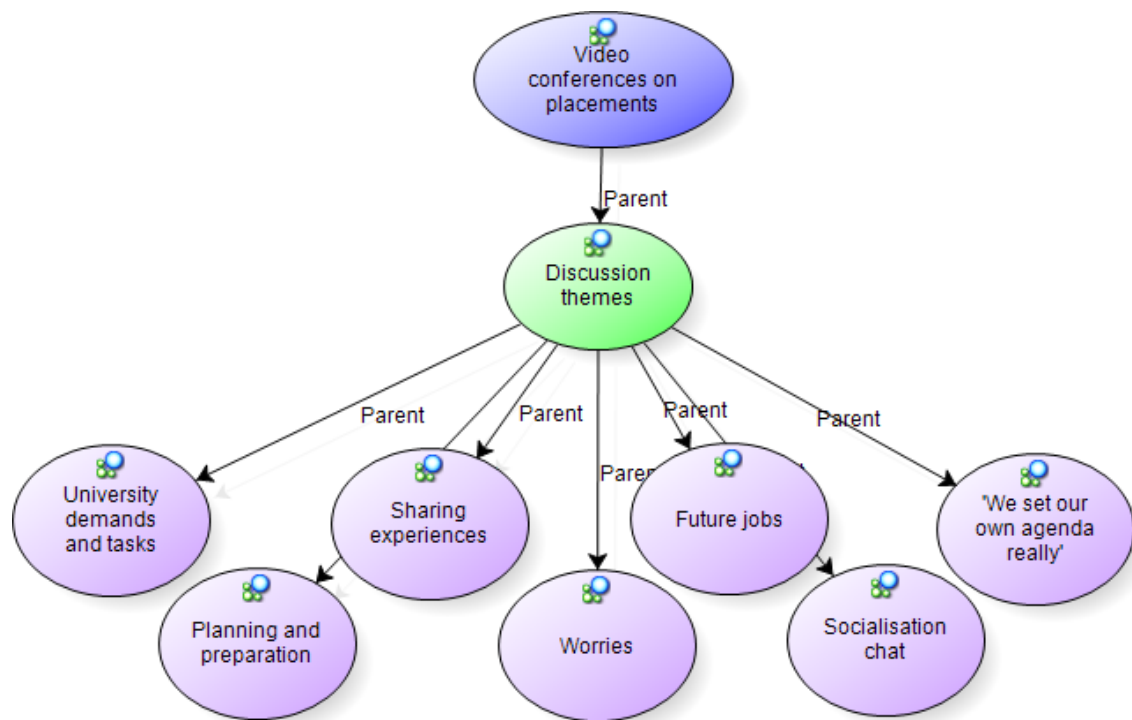


Figure 4.8: All the discussion themes emerged with peers during multi-point video conferences were categorised and presented in this graphical display

Video conferences through the ‘eyes’ of the involved trainees is the subject of the following sections which are largely concerned with the evidence which emerged from group interviews. The first of these is the question of ownership of video conferencing by the trainees. They appeared to adapt the system to their own preferences.

4.5.2 Taking ownership of the video conferences

‘K [Trainee]: I think it worked quite well the way we did really because we sort of talked about everything and it just it doesn’t end really

L: We set our own agenda really didn't we? [...]

L: [We talked about everything] because they were relevant really wasn't it? What we were doing that week really'

[Group interview with trainees after TE1]

Although the initial idea of the multi-point video conferences on TEs had been to set up structured and themed meetings, what appears to have happened was that the group of trainees 'took ownership' of the process with the majority favouring the agenda to 'set itself' according to what was uppermost in their concerns, whether that was about practice, or personal or social. This seems to be an important development as it suggests that the ability to communicate and see each other at the same time, in real time and fairly close temporally to the 'events' under discussion, was the really valuable thing for them, not necessarily a pre-determined 'topic for discussion'. However, there were mixed perspectives in regard to setting a pre-determined thematic area since some trainees suggested otherwise.

Explicitly, there were some trainees who suggested that covering a different pre-planned thematic area in each online meeting that they themselves would choose would have helped them to have a context or a focus. A trainee, as shown below, added that setting particular topics could have been useful during TE1 and TE2 but not during TE3 as the trainees' experiences diverge in the latest and longest TE.

This idea is in line with the trainees' stages of concerns analysed in the previous section as it suggests that trainees had been initially focused on what they personally needed to do on the course and what it takes to become a teacher. Hence they could have had specific topics to discuss, for example going from students' talk on university tasks during TE1 to more like teachers' talk on teaching issues during TE2. As trainees grew in confidence they could just talk about their own TEs and ideas.

'E2: I think if you were doing this next year, [...] I'll say for each week have a particular topic for discussion. We [trainees with the researcher] spent a while didn't we [during TE2]? To get an idea of what people [peers] wanted to talk about and I think that TE1 and TE2 that would help work a lot better. I think that TE3 it's bit difficult because everybody, you know, some people [peers] struggle some aren't and it would be harder to know what people wanted to talk about. It is probably better to let it run free but for the first two TEs if you were doing it again next year I'll say have a subject or topic for each VC like science tasks, English task, maths tasks, and then in TE2 I don't know planning, differentiation, things like that'

[Group interview with trainees after TE3]

Further the initial scheme had been for a university tutor to join multi-point video conferences to guide the group of trainees in 'making sense' of their TEs. However, for workload reasons and some technical issue the university tutor dropped out but the trainees engaged enough in the process to proceed with the multi-point video conferences. In fact the majority of trainees asked in group

interviews whether the presence of a university tutor would have made any difference to the way their video conferences evolved, they suggested that some of the discourses which arose via video conferences could not have occurred in the presence of a tutor. One trainee's quote here indicates this perspective.

'E2: Well it would affect some of the things you could say [if we had a tutor invited in the video conferences]; I don't think that people would be as honest, when its just students [peers] you can say: 'Oh, I did an awful lesson on this' but if you had a tutor in there you wouldn't want to tell the tutor: 'Oh, I did an awful lesson there'; so I think it would probably not work as well if you had tutors in there. If you want it one-to-one with a tutor I think it would be OK but with a group of four of you its best to keep it just students and that way you can cheer each other up and you know'

[Group interview with trainees after TE3]

In fact it reveals that the absence of a 'formal' or 'expert' voice meant that they were more free to express their feelings, thoughts, failures, weaknesses, missteps in the classroom and in schools and actually in this way were facilitated to 'come closer' for two reason. Firstly, they off-loaded issues that they could not have said in schools or in front of a tutor and secondly, in this way they were enabled to realise that there were others going through similar situations as they were. Hence they did not feel so alone, especially when things happened to go badly.

A number of trainees said that they were keen to 'see *new faces*' joining in every week expanding in this way the opportunities for sharing and creating a bigger peer-supporting network. However, on another issue related to the preferable size of the group in a multi-point video conference, some trainees reported that too many participants in a single meeting decrease the opportunities to discuss in-depth their personal TEs. In their view, the preferred size group for an online video conferencing meeting was four participants. Those trainees argued that there is a limit that you can have in a meeting because when there are too many people talking they found it hard to remember what they wanted to say. It also meant, they said, that they had to wait until the opportunity to say what they wanted came along and then by that point the conversation had moved on. On the other hand, one-to-one conversation was demanding, whereas when three or four people were involved was the preferable group size. This representative quote shows one trainees' point of view:

'E: ...the last one [video conference] almost there was too much talking going on so you had to wait your turn and try picking your moment to talk but I thought 4 was a good number of people. I think that when there was 6 of us, in one wasn't it? I thought that that was a bit hard because out of the hour you probably spend 45 minutes listening and 5 minutes talking but when there was four of us and there were no technical problems it was really, really good fun'

[Group interview B with trainees after TE2]

The trainee describes multi-point video conferences as '*good fun*' in addition to the number of other benefits which were reported. Those were classified here as social, personal and pedagogical. The following section considers these benefits.

4.5.3 Social support

'T [Trainee]: But we didn't really see each other [peers who happened to be posted at the same school]

E3: No, we just pop in saying 'Hey, good day, bad day, catch up with you later' but if I've been in a school with nobody else without the video conference I'm sure that I would have felt very lonely'

[Group interview A with trainees after TE2]

A number of trainees who lived far away from campus and/or were posted alone in schools, reported that multi-point video conferences '*saved*' them from a lonely journey. A number of them claimed that having a person they already knew from campus to share '*how was their day*' at schools provided them the social support they needed during TEs. This means that there were already existing relationships developed in face-to-face encounters at the university which were sustained online via video conferences. In fact, multi-point video conferences did not create a community of trainees within the PGCE course but appeared to serve not only in sustaining but also in expanding a community of trainees when it was physically apart. Some trainees who were appointed in a

school with one or two other peers reporting several obstacles keeping them away from each other including lack of time, energy, different schedule and hectic week, found that video conferences provided them with the opportunity to catch up with peers in a way that it was not possible before. For example they did not overload their week any further by travelling and with making arrangements to physically meet up with peers as they could just meet virtually.

It was reported by a great number of trainees that video conferences assisted in defusing a quite stressful and demanding period of time in their lives when they were posted in different schools. A trainee admitted *'never learnt so much in [her] life'* and others that they felt like being on *'a learning curve'* and finding it like a *'deep learning on TEs'*. Thus, the majority of trainees reported that video conferences provided them with the opportunity to *'have a laugh'* with their peers and also that the video conferencing with peers *'just put a smile on [their] faces'*. In this way a number of them reported feeling reassured to know that others were in close proximity at least emotionally. An indicative interview excerpt is provided here.

'K: You should have seen E3 [peer], she was like from a horror film [Laughs]

E3: I sat on my bed all the time, appearing funny! [Her camera was out of focus]

K: It was really funny [laughs] it was a bit like light heartedness I think for the week of absolute stress. For an hour I just could calm down and

forget about it. But it is always how you take comical stories and you laugh with E2 losing a kid in a maze [...]. That kind of thing make me really laugh and think that TE2 is not just about seriousness, you can have a bit of fun on trips and E2 like with his Abraham Lincoln hat like talking to me on the camera it was kind of like defuse the situation, realise that life is OK and teaching is not about being strict and you can have fun and like brings you back a bit'

[Group interview A with trainees after TE2]

This 'defusing' of the seriousness of a TE period through social interaction and with a good sense of humour among peers seemed important primarily because they were doing so with others who had experienced the same or similar kind of situations and were shared as they happened. In this way a number of trainees seemed to be enabled to 'offload' to a friend, a peer rather than 'keeping it to themselves' during TEs. Hence, sharing funny stories, having 'nightmares' at schools or talking about fancy dress events, school trips and making jokes lifted their spirits up for a number of trainees. It defused their hectic daily routine of being at a school and then prepare for the next day at school.

A number of them said that not only the discussion with peers helped in alleviating their worries about the classroom but even gave them the spark they needed for doing well for the rest of the week. Even a number of technical glitches including time delays, cameras out of focus during video conferences were seen as funny incidents, as revealed in the above quote. The dress code

and discourse type appeared to be informal enough to endorse a comfortable, safe environment for friendly teasing and sharing jokes, stories, feelings and experiences.

One trainee who said to a peer who couldn't bring her camera into focus: *'Don't worry it looks fine I know it's you'* shows that the effect of the transactional distance of the technologies on the trainees' interactions, which means the psychological and communications space afforded by the technologies, was reduced to minimum. This means that the distance afforded between the trainees and the fact that the dialogue was mediated by the technologies was in some way discounted in that it did not affect negatively the majority of trainees. On the contrary, the interactive face-to-face nature and the immediacy of the multi-point video conferencing during long lasting TEs enhanced their feelings of *'togetherness'* and *'social presence'* rather than created a space for misunderstandings or uneasiness.

Thus their discourses seemed quite spontaneous, personal, and dynamic because as some of them said they knew each other well enough to feel comfortable and at ease when talking to one another. Further, the fact that the video conferencing enabled them to say: *'Hang on a second, I'll show you [something]'* seemed to have added a more interesting perspective in their discussions and enhanced their feelings of *'social presence'* because they were

able visually to exchange something (show an object, artefact, website) in response to just-made comment even at a distance.

It appears that the period of time in which trainees were experiencing oppositional situations of presence and distance within their university community by either being physically close at the university, or distant at schools was somehow bridged down by the immediacy of the video conferences. For a number of trainees multi-point video conferences offered a degree of social presence when at a distance. The social aspect of the video conferences was found by the majority of trainees important, however these social interactions had led to other kind of benefits discussed here including personal and pedagogical.

4.5.4 Personal support

'E2 [Trainee]: The VC I loved because it just reminds you that you are a student. I think that the last session we did L2, P [peers] and myself just lifted my spirit up a bit, I don't think I learnt anything from it but it just gave me the little pickup I needed for the next week and it reminds you that there is an end to it, makes you feel a bit better that other people [peers] are finding it tough as well'

[Group interview with trainees after TE3]

Within university communities enabled via video conferences and with the support of their peers, a number of trainees, as indicated above, found that they were able to feel part of a community to remind them that they were in the process of becoming teachers. Also video conferences were a good reminder that they were students and there would be an ending to what they were doing and, that others were experiencing difficulties as well. Although the trainee above claims that the video conferences were mainly useful from a morale, rather than a learning point of view, later on in the same interview he added that they were also useful from a practical point of view which is the subject of the next section.

In regard to the personal support received via video conferencing it was emerged that this element of keeping track of their colleagues' progress whilst on TEs was vital for a great number of trainees. Only one trainee reported otherwise, which was discussed previously in this chapter. That trainee thought the sharing of progress among peers during multi-point video conferences had a negative effect on her confidence levels because she was afraid to be left behind. Explicitly she reported being hesitant about engaging in this process because of her concerns about her own progress and assumptions that everyone else must be doing better than her. Therefore it seems that there could have been a tendency perhaps for some trainees to want to stay in the 'bubble' for fear of exposure. Hence, it could be said that there could be a degree of relief, having taken the risk to communicate, which was in finding out that actually everyone else was struggling as well or encountering both highs

and lows. At least the majority of trainees found that being aware of their own progress and of their peers and actually getting out of their own '*TE bubble*' by talking to each other provided them with the confidence, relief and reinforcement they needed that they were on track.

'E3: I think you get a little bit of a bubble don't you? If you don't see people, you don't speak to them you get your own TE bubble don't you really? You completely forget everyone else is on TE you think that it is just you and the school. I think it was quite nice to be able to talk to people [via multi-point video conferencing]'

[Group interview A with trainees after TE2]

In fact, it was argued that even when facing difficult times on TEs having their peers around to confess anything: not willing to complete a university task, keeping '*skimpy*' notes instead of proper assessment sheets, having a bad day or facing a difficult to handle situation at school, created a feeling that they were being all in the '*same boat*'. Phrases including '*I know where you were*', '*I'm not far away*', '*I'm absolutely with you on that*' were regularly shared to facilitate a number of trainees during TEs. Therefore, although the great majority of them felt like having '*miles to go*' because they were accompanied by others with whom they shared similar questions, worries, doubts, and fears, those were minimised. This quote is a clear indication of the majority of trainees' views.

'E2: I think because it can be quite lonely on TE. When you in a school 8 till 6, you come home, have some tea, then you go off to the library or work from home until 10:30-11 o'clock, then go to bed, wake up in the morning and do the same thing. If you've got a meeting with someone it breaks that evening up, and yea you can share ideas, and I think it just reminds you that you are part to something bigger, not on your own; and I think it's kind of lonely and I think a lot of people failed this TE and, I think a lot went there all alone in a school and they get separated from the friends and get overwhelmed by the pressure and then crumble really, yea. So I think that the video conference helped in the sense that it reminds you that there are others going through this, you know, we are all struggling and you know that I'm a student and I'm learning and I'm not supposed to be a finished article. It certainly helped me anyway'

[Group interview with trainees after TE3]

In fact, it is argued in the above quote that for a number of trainees video conferences could have served in minimising levels of stress. For those who were struggling on TEs they could be benefitted by their peers socially, personally and pedagogically since they could see how others were coping.

4.5.5 Pedagogical support

'E2 [Trainee]: [...] I think that it is nice to keep up contact because when you are on TE you tend to forget that you are actually at the university so I find this a nice way of just keeping in contact with people. I think its sharing ideas I think that's the main thing, and like

you said support from a morale point of view as well as practical point of view. Have a lovely weekend, I hope it goes well, Take care!

[Trainees' multi-point video conference in TE2]

In the group interviews the majority of trainees underlined the social and personal benefits they got from the multi-point video conferences and actually only a few trainees had actually realised that the video conferences enabled them to frequently share teaching ideas within their peer communities during their TEs. However, indirect unstructured support in the form of *'Can I just pick your brains...?'*, *'Have you checked this website?'*, *'Any ideas on that?'*, *'And that's how I plan...'*, *'I'll show you like what I was doing'*, *'Have you done that?'* were disclosed in all of their multi-point video conference discussions. In fact, in the realm of their discussions the majority of trainees were intuitively exchanging ideas related to various different teaching methods, tools, materials and activities, pupils' behaviour management strategies and assessment methods.

Practical tips, hints and tricks were also regularly shared on what may or may not work in the classroom in real practice based on their own personal experiences especially when their teaching identity had emerged and they had their confidence built up in teaching. At other times, when they struggled on something at schools they had the opportunity not just to share it with peers and feel supported emotionally but also practically they could ask for help, support and advice. As it was also argued in this support could be more

relevant in comparison with any other support because they knew exactly what each other needed because they had been in the same situation or were still facing the same situations, therefore they knew what needed to be discussed or not.

'E: E2 can I just pick your brains when you sort of planning for your lesson what information have you been given as to have, to un-pitch it, so as to getting it the right pitch for your class, for your targeting?

E2: In terms of differentiation? [..].

K: Give me a moment. I will give you the website right now, to show you like what I was doing

E: Lovely! Thank you K because I've been struggling with it this week really so'

[Trainees multi-point video conference on TE2]

Thus, this continuous online communication network of peers seemed to have provided peer feedback to meet their immediate needs and find out ways to resolve their struggles. In fact for a number of trainees, multi-point video conferences could have helped those who were struggling as claimed in the following excerpt.

'J: And I think that they [trainees who did not happen to join any multi-point video conferences] are missing out because if they could spare

an hour a week it could really help them and maybe for those that struggle

E3: Those they are struggling because they could hear about what we are doing how we are coping and it could help bring them back as well'

[Group interview A with trainees after TE2]

Some trainees also argued that during TEs they were enabled to reflect on their experiences. For example a trainee as illustrated in the following interview excerpt suggested recording and reviewing the multi-point video conferences because he realised that peers tend to remind them about things in their work, their pupils' achievements, their methods and strategies used. It also revealed that self-reflection had been an important competency that the university required them to develop as they were required to complete written weekly reflections.

'E2: I think again if there is one [video conference] on a Thursday night I think I would love to do it again because it was a good way of reflecting back on the week. In fact sometimes I wish I'd been able to record the session because often other people would remind you of things [...]

A: Is it possible to record?'

[Group interview B with trainees after TE2]

Although it was not reported clearly in group interviews, self-reflection assisted a number of them to intuitively engage in rethinking and evaluating their actions and through talking and reflection with peers to gain a deeper understanding and a new perspective on their experiences. For example a number of them were engaged in discussing where they had been, where they were and what they needed to reach. Thus, when exploring and discussing the developmental stages they had gone through and the changes that happened to them at the crucial times they were actively tracking their progress with the potential to move forward. This is a metacognitive process of thinking back on their learning which may well be encouraged during multi-point video conferences.

4.6 Research Scheme 1: Multi-point video conferences -

Summary of main findings

The development of a number of trainees as teachers, with all the identity issues discussed in this analysis, had emerged from peer discourses during multi-point video conferences for the thirty trainees who took part in this section of the research study. In effect, the role of the multi-point video conferences could be said to be that it enabled a number of trainees to discuss their experiences, their progress and to receive social, emotional and pedagogical support to move forward.

In particular, the role of the multi-point video conferences in facilitating and even enhancing these processes was dual. Firstly, a number of trainees were provided opportunities during TEs to discuss pedagogy, by exploring with one another various classroom, teaching and school experiences 'as they happened' and to 'compare notes' which would have been impossible without the use of the technologies. Secondly, they were also enabled to talk about the course and thus 'make sense' of the university experience and learning in practice at schools and in the classroom. Hence it could be argued that multi-point video conferences on TEs appeared to have contributed in bridging the two elements of the course together, school TEs and university, by expanding an existing peer supporting network whilst on TEs.

Explicitly, it was revealed that self-reflection, reflection with peers and peer feedback enabled via multi-point video conferences had assisted a number of trainees, within peer communities, to set targets for completing everything that needed to be done in the course. A number of them shared ways of balancing some of the university demands with the demands of being a proficient teacher by discussing conflicts that their dual identity produced, and/or successful resolutions that yielded useful results for their pupils' learning. Even at times, when some trainees admitted not being entirely efficient or missing out something completely, this brought them together because they realised that they were among others who were struggling like themselves. Moving from their university to the community of teachers appeared to entail backwards and

forward transitions, 'ups and downs' as they called them hence some of them reported that any support they could get from peers was welcome.

Multi-point video conferences was not the only way that appeared to have assisted the process of the majority of trainees' transition in and out of two overlapping communities towards becoming teachers. In fact, another video conferencing format was integrated in the course in combination with the multi-point video conferences on TEs. Those were the remote classroom observations implemented when trainees were on campus. The contribution of those video conferences introduced in this thesis as the first research scheme is discussed here.

4.7 Research Scheme 2: Contextual and pedagogical factors for implementing remote classroom observation

Initially, all of the participants' suggestions and thoughts were gathered together and synthesised to comprise here the contextual factors for implementing remote classroom observations. Some pedagogical factors were also revealed in this analysis.

To begin with, it was found that the classroom arrangement and the technological aspects of the video conferences including camera movement

and sound quality were important factors for nurturing the feeling in the observers of being close to the learning scenes. In particular, the VC2 and VC3 which involved camera movement around the classroom to enable the university site to observe group work and get a real feeling of the class activity was much more appreciated by all the university tutors and the trainees rather than the VC1 at which there was no camera movement in the classroom. Similarly, for the other site the participating teacher on VC1 found it difficult to see facial expressions of the trainees on the screen showing interest, enthusiasm and satisfaction because they were no zooming in/out or close-up shots on camera.

Some trainees and university tutors acknowledged that the video conference was not effective compared to actually being in the classroom and seeing what the pupils are doing, hearing clearly what they are saying and scanning around in the classroom to observe various features of the classroom life. Therefore, a few of them suggested in future video conferences the camera be moved remotely from the university site in order to eliminate any feelings that the camera was controlled by another party and ensure that the video conference experience come as close to the actual situation of being physically present as possible. Also in contrast to a number of trainees who thought that the pupils' behaviour and the teachers' practice were affected by the technology and because people were watching their lesson, the experienced teacher argued that she had to ignore the fact that she was being observed by the university because otherwise she would have been nervous. In addition, she claimed that

she had been used to being observed by many different people throughout her career therefore she was acting naturally. According to the Science subject tutor, a video conferencing observation does not change the setting of the class, only to the level it would change if an observer was physically present in the classroom.

Further, some organisational matters including an initial pre-conference call that took place before the VC3 between the university tutors, experienced teachers and people who would capture the lesson on camera without the presence of the trainees or pupils, was also considered useful. It was found that this assisted in sharing information, explaining purposes and resolving technical issues associated with the camera and microphone movement around the classroom. This seemed enough to save any major technical glitches or mistakes and enabled the two sites to know exactly the other site were looking at during the actual VC3. This was in contrast to the VC1 at which both technical disruptions and weak communication of goals and schedule between the two sites occurred. Consequently, the common wisdom that the more you do the more confident and better you become applies here, since each VC was found to be better than the previous one. However, the need to feel secure that the video conferences would run successfully or at least ensure that there were backup plans or contingency plans was underlined by all three university tutors and a number of trainees. They highlighted that the time spent at the university is quite short and thus it has to be managed carefully and effectively. A university tutor found that '*it's all part of being involved*', which means that there

was a lot of preparation, planning, and cooperation between the university, the school, and the technicians to achieve a successful link.

A key pedagogical factor beyond the technical and organisational aspects of implementing video conferencing in a Primary PGCE course was reported by all three university tutors and the great majority of trainees. This was the need to align the lesson's objectives to the course. In both the university and trainees' views the video conferences needed to acquire a purposeful thematic focus which was well-integrated into the PGCE curriculum, which means relevant to what they were doing at the time at the university. Two university tutors claimed that choosing the appropriate time to observe a lesson was also important. Hence, they suggested that a good time to implement a video conferencing link was after a specific topic had been introduced and discussed on the course in order that the trainees would feel confident enough to relate what they had been doing at the university to what they were seeing online. This would enable them to pose meaningful questions and engage in a pedagogically useful dialogue with the experienced teachers.

Another suggestion related to having a more pedagogically useful feedback time or dialogue at the end of each video conferencing was mentioned by the two university tutors after the VC1 and VC2. They suggested facilitating a smaller group of trainees to interact with the school. This idea was taken on board on VC3 and the results were that the smaller group size at the university

site placed in a small room assisted the trainees to feel more comfortable and engage with the site better than within a larger public forum. In a large group a number of trainees felt too intimidated to pose questions in front of the camera to the teacher or to the children, who they never met before, and particularly in front of one hundred and eighteen of their own colleagues.

Some trainees also stated that they wanted the interaction slot with the class extended and they suggested perhaps having the teacher separated from the class in a staff room to direct 'difficult' questions. On the other hand others thought that they appreciated the presence of the pupils because they wanted to ask questions. This is associated with the trainees' stages of concern discussed previously in this chapter. As a Science subject tutor argued, the majority of trainees were usually so busy thinking about themselves in the classroom, and their competencies as teachers that they did not really ask the children, they did not talk to them effectively, especially at the first stages in the course. However over the time in the course, for example on the VC3, a number of trainees realised that they wanted to ask the children about the lesson, whether they enjoyed learning in this way, or whether they learnt something useful. Therefore, they seemed to have made their transition from looking into themselves to looking outwards towards the pupils' needs as they thought that it was interesting to 'see' the pupils' perspectives on their learning.

A number of trainees also appreciated the fact that they were given observation points to focus on at one specific investigation area at a time during the video conference because it provided them with the structure they needed. Others thought that they would have preferred having a plain sheet to taking notes. This however seemed to be associated with the preferences and personality of each trainee.

After a video conferencing, a number of trainees suggested being able to re-watch the lesson in order to see it from a different angle. Some suggested having a series of follow-up lessons and different phases of teaching to see what came next or suggested observing similar lessons delivered in another part of the UK in a different class. The Education Consultant of the Local Authority was keen to organise future video conferencing links with schools and universities across UK and obtaining funding or contact lists from interested participants to open practices up. His professional view was that there was great potential for this method of training both for the PGCE course and for schools involved. Those benefits will be discussed here.

4.8 The value of the video conference for remote classroom observation

The video conferencing effect towards all involved participants, trainees in particular, university tutors, experienced teachers and pupils at schools will be

revealed. In addition, four models of video conferencing use which were adopted from Lawson and Comber (2010) and adapted for the video conferencing events will be presented.

4.8.1 Bridging the university general topics with actual schools

'W [University tutor]: Well, I think it's the connection between lessons, what we lecture here, the generic topics here and actual schools and actual practice which must be very valuable. I mean, I'm setting up something that I've done each year, I'm in the process of organising an English focus day. We send our students to two schools [...] and that it takes a lot of organisation [...] I think that this video conferencing is potentially... is like that but much quicker and much more instant and everyone potentially seeing the same thing so I think I can see the value. It kind of reflects what, some of the things that I'm trying to do anyway that I see as valuable'

[Interview with an English subject tutor after VC1]

This English subject tutor's quote encapsulated three of the benefits which emerged from data for the remote classroom observations via video conferencing in this research. Firstly, they sit on the overlap of the two communities, university and schools, since they provide the link or bridge between the lessons, lectures, generic topics and actual schools and practice. Secondly, they were a practical, and instant solution to the logistics of connecting schools and university. Finally, they allowed classroom observation

in a group situation at the university site. Although the second benefit is clearly associated with the technical attributes of the video conferences, their synchronous nature, the capacity for interaction and instant communication, it was revealed that these alone were not enough for employing video conferences on the course. It was said by this university tutor and other colleagues that video conferences had to reflect or enhance their work which means to they needed to have a tightly-structured pedagogical purpose in order to be useful in the course.

In regard to the first benefit, recalling the analysis at the beginning of this chapter a number of trainees required a balance between the information provided at the university, with practical applications. As it was also previously argued, a number of trainees sometimes felt that during their time at the university they were 'losing touch' with children and it was thus more difficult to relate what they learnt at the university to schools. However, with the introduction of the video conferences a great number of them found it beneficial that whilst being in a university setting they got to see effective teaching in practice. They reported that this reinforced what they were learning at the time at the university because it provided a meaningful, real context to it. In other words, a number of them claimed that a video conferencing link integrated into a unit they were doing at the university, not only was a good alternative to lectures but they actually got to 'see' the actual practices of an experienced teacher which she or he had developed over years in the profession,

representing the craft knowledge of the profession. A trainee's indicative quote claimed:

'A: Well as I said before it [video conference] really help to secure that link between the university based stuff that we are learning and actual teaching and actually helps in making that link'

[Group interview B with trainees after VC2]

Cross-checking the data, a Science subject tutor claimed that for the majority of trainees having the opportunity to have the two experiences of learning: what they were doing at the university and seeing pupils doing it in the class via video conference was worthwhile. In this way, he said, they could compare, match or contrast what they were doing at the university with what they had seen in the class. They could also share their perspectives and thoughts and then figure out, or find their own ways of doing it. In other words, these video conferences appeared to provide another way of making sense of the university learning in the classroom context:

'S: [During video conference] it was reinforcing what they've [trainees] learnt in the science lesson and with me [university tutor] being there, they would have remember what we have been doing and ideally [...] I would have asked them to compare and contrast what we've seen and I ask them how does that work? and what we were doing [at the university] how does that work? and see which way they would do it, so that they'll have more choice of discussion'

[Interview with a Science subject tutor after VC3]

For the trainees the presence of the university tutors along with other peers observing in a group situation the same lesson and reflecting on it was also seen as valuable in making connections between the school and university experiences. It could be argued that this led to social constructivism in action.

4.8.2 Social constructivism in action

S [University tutor]: [...] Usually students [trainees] are by themselves in the class when they go in and observe but in the video conference there are, basically about ... if we had ten students observing the same lesson. It's very unlikely to happen in a natural setting, we couldn't have ten students sitting in the class and observe like that. Also it means that things that one student notices and another student doesn't notice, they can all look and they can all learn from each other's observations of the lesson [...]

[Interview with a Science subject tutor after VC3]

In particular, the Science subject tutor, as illustrated in the quote, argued that logistically it would have been unlikely to have a group of trainees observing the same lesson in a natural setting whereas video conferencing makes that possible. But crucially this university tutor added that the things that one trainee noticed and another trainee did not notice, were shared. This means that during the video conferences a number of trainees learnt from each other's observations of the lesson because they could be looking from a different angle and thinking in action. Explicitly, the common observational basis provided via

video conferences seemed to have enabled the sharing of insights, thoughts and understandings between a number of trainees and university tutors that leads to social constructivism in action. In fact, a number of trainees claimed during a post-analysis session after the VC2 being pleased with themselves because during the video conferencing they felt capable of deconstructing a classroom context which means unpicking several teaching and learning strategies and understanding them or reconstructing them cooperatively, based on the contextual knowledge learnt at the university.

In addition both trainees and university tutors could direct questions to the experienced teacher and pupils and learn first-hand what their objectives were, then watch the session, and search for questions and then ask them or challenge them to reflect on their lesson, for example on what they would change? What had they felt worked well? For some university tutors and trainees this aspect of video conferences distinguished them from recorded media but most importantly they could learn from listening to each others' questions posed during the interaction slot and discussing them with peers and university tutors even after the video conference, as shown here.

'S: We [university tutors, trainees] could be looking from a different angle [a remote class] and I think that students [trainees] can learn from listening to the questions that other students have [during the interaction slot with the school] and then discussing with them [peers]... Via [video conferencing at] the university they [trainees] see a classroom teacher in action and then talk to the teacher who is really doing, is a practitioner

but at the same time have the opportunity of having tutors as well as all the others students' thinking in action, is useful'

[Interview with a Science subject tutor after VC3]

As a result, bringing together the university knowledge and expertise (university tutors) with actual practical experience (teachers and their pupils) in a common context was seen as beneficial for the majority of trainees who appeared to 'sit' on the overlap of the two CoP moving onwards and backwards towards full participation to the teaching CoP.

4.8.3 Legitimate peripheral participation activities

'N [Trainee]: [...] it [video conference for remote classroom observation] gives us ideas for teaching really doesn't it? Like how it is actually done, like current ways of teaching and also different teachers' styles because I mean I haven't seen that carousel thing for [...] younger children at foundation stage so they worked really well

F: And even to seeing inside different classrooms gives us ideas for when we have our own classroom because we were only seen a limited number of classrooms'

[Group interview with trainees after VC3]

Observing live lessons was considered useful for the majority of trainees as illustrated in the above interview because it provided them with the opportunity

of seeing a variety of different techniques and how those are applied in the classroom. A number of video conferences throughout the course showing a variety of different ways of teaching was also suggested by some trainees to provide a gamut of experiences to provide ideas on different teaching styles in order to construct their own teaching identity.

As was discussed earlier in this chapter the majority of trainees needed to have the time, space and legitimacy to observe, examine and discuss everyday teaching practices without taking major risks in the classroom. Hence, video conferences for remote classroom observation seemed to provide opportunities for such legitimate peripheral participation activities. In this way, an English subject tutor claimed that video conferencing as a tool changed the traditional artificial tasks of the lectures that involved the trainees reading, thinking about and imagining a working classroom, whereas video conferences offer the opportunity to participate peripherally in a real class since they can see it work and then question the teacher and pupils.

A number of trainees thought that it was interesting to make comparisons between teaching styles and between what they already knew or had observed at schools with other teaching styles at different schools including seeing another way to use a strategy, another way of doing it in another school in a quite unrelated location to the schools they had taught in or visited. Some of them claimed that they also came to understand the pedagogical emphasis of

each school in different locations based on the population's needs. A few trainees said that gaining a number of different ideas which could be transferable to different age groups enabled them to think in a pedagogically critical way on how, where and in what ways they could adapt, adopt or enrich different ideas either on lesson planning, differentiation for each ability group, or classroom management. Overall, the majority of trainees and university tutors found it useful that video conference offered a genuine representation of classroom life.

4.8.4 Authenticity

'G [Trainee]: I think what we [trainees] have said it is why this [video conferences for remote classroom observation] is good thing, it's the fact that you [trainees] won't just see a closed up version of everything going perfectly and the bits they [others] want you to see, rather you see the whole picture, you see where the teacher is stumbling or where the children are calling out inappropriately. You see the real picture, so I think that this is why it [video conference] is good'

[Group interview A with trainees after VC1]

The majority of trainees identified the authenticity of the video conferencing observations as the most valuable aspect of it. They explained that watching the strengths as well as the pitfalls of an hour real-life lesson from the beginning to the end without interruptions was much more beneficial than seeing a preset,

short video-clip of a classroom that others including a director or a university tutor had selected to show them and perhaps edited. Although, the focus was not to make any comparisons between recorded media and video conferencing, but to discuss what video conferencing had to offer, in its own right, it was revealed that the video conferencing 'disrupted' typical practice. This means that video conferences seemed to modify the process where a university tutor was responsible for determining through selection of particular issues, and therefore video case episodes reflecting those issues.

As the English supplementary university tutor explained, if she was about to show a video case episode to a group of trainees, she would have make sure that she had seen it beforehand to be able to know exactly what she would use for her lecture. In fact, she claimed that from her experience she knew that a number of trainees sometimes do not '*automatically look for the right things*' when observing a lesson and hence they need to have some focus questions which is quite feasible when she watched the video episodes in advance. On the contrary, with the video conference as she explained '*none of us have seen the lesson in advance*'. A number of trainees also said that video conference was an observation of a lesson as it happened, which meant that neither themselves nor university tutors knew what was going to happen next – whether it would work or not, or how the teacher would manage or respond to pedagogical challenges. In this manner, the university tutor appeared to have relinquished control of the agenda before it happened. Her role shifted to helping the trainees make sense of events afterwards - having been in the

same position as the trainees but watching with the eye of an expert rather than a novice.

In fact, the Science subject tutor had realised her role was one of making sure that the objectives of the video conferences were achieved by facilitating, guiding and asking questions. For example if the objective of the video conference had been looking at how teachers assess their pupils' work she would have made sure that trainees were focusing on assessment, thinking, looking and talking about it rather than providing a pre-planned agenda, examples and materials. She explained that she would have opted to have a pre-conference meeting with the teacher, to meet each other and also to talk about how the video conference would proceed, but this would not mean that she would have acquired any power or influence or possibility of knowing how a lesson would proceed in practice. The English supplementary university tutor's words encapsulated in the phrase *'I was going cold'* during the video conference included in the following quote, revealed that due to this aspect of the video conference her job there was not an easy job to accomplish. It appeared quite challenging to go from the position of controlling the agenda to the one of the learner.

'T: [...] in my terms because I've been doing it [observing classroom practice] I am just looking at EVERYTHING so when you show a video to the students [trainees] you've already...I've already seen the video beforehand, so I've observed this lesson so I know already what I'm

going to pull out of this lecture for the students there. So yesterday morning I was going cold and I was just looking at things all the time, but so we say the interaction with watching a video is that the tutor should have watched it beforehand and will be drawing up the points. Even if you don't say them to them [trainees] you want to say: 'Tell me, write down all the times the teacher praises the children' make some notes some feedback: what did you hear she is saying today'

[English supplementary university tutor interview after VC2]

Although a challenging learning environment, with the video conferences the practices of the teaching community and the craft knowledge were transmitted directly and unedited from the school community to the university community. In other words the video conference provided authentic input from the one community to the other. In a number of university tutors' views video conference represented the naturalness of a situation, how the teacher organises the lesson, and structures it for individual needs and plans it thoroughly. For a number of trainees it was also this element of seeing a 'live' non-contrived environment and the feeling that it could only be watched once that led them to feel more alert and tuned-in. Some of them claimed that not that they wanted to see a lesson going badly but for them it was much more appreciated to 'see' how a class really works with all the disruptions, changes, adaptations, stumbling or unexpected issues that it involves. In this way, a number of trainees would probably feel better especially if they had themselves endured a bad lesson or had some not so positive experiences at schools. It could build up on their confidence that it is probably all right at times not to be

perfect. An indicative quote of a trainee recognising the authenticity of the video conference observation is provided here.

B: Yes it [educational video] is scripted and you don't know, certain things come out of it that are useful but I think in a live link...not that I want anything to go wrong with it but there are things that [happen in the classroom unexpectedly]...kids can start acting up that you can't do anything about whereas, in a video you edit it and you take those bit out of it and so yea I think that element of it, you see a real classroom rather than a contrived environment'

[Group interview B with trainees after VC2]

4.8.5 Technological literacy

'A [Trainee]: I'm interested in IT [Information Technology] so I mean I am doing IT as my specialism so for me it was the actual, physical video conference aspect of it, you know, with the microphone that was moved between the tables and you know things like that. It was quite dynamic to actually think about: Could this be standard practice? Where can I use it? So, for me it was the technology rather than the context of the lesson that I personally found the most exciting'

[Group interview B with trainees after VC2]

A number of trainees claimed that the technological aspect of the event, linking the university with a local and a distant school in UK, was particularly interesting to see. In this way, they acquired first-hand experience of the

possibilities and qualities, the limitations, and the technical support and steps required to use the video conferencing technologies. A number of them stated that they were inspired to think of other possible applications of video conferencing in the educational arena, including bridging together two schools in different parts of the world talking to each other and showing their work, or university tutors watching them on TEs or even inspectors watching experienced teachers at a distance. Only a few trainees had had the opportunity to use video conferencing before, at times other than for their own personal communication and participating in professional video conferences in group settings was a hands-on experience. A university tutor believed that there was an additional scope in setting video conferences since in her opinion in the future video conferencing will be utilised far more than today because the younger generation are more used to interacting and having a social life online.

4.8.6 Positive effect for the university tutors

'S [University tutor]: For myself the outcome [of observing a remote classroom via video conferencing] was basically: I do teach about that, I have taught the same topic [with the one observed] to the trainees so to see how... what is the expected outcome for Year 6 pupils [in science but] it was good to see how it was assembled in the classroom context by an experienced teacher who is right now dealing with one class. That way, I learnt from her [the experienced teacher] and I will use that kind of... [knowledge and examples] basically in my teaching [at the university] [...] to talk to them [trainees] about how you can organise and manage teaching in the classroom with more confidence now'

[Interview with a Science subject tutor after VC2]

As is revealed from the university tutor's utterance above, observing a science topic assembled in a classroom context via video conference differed from the situation of teaching at the university on how a teacher teaches the same specific topic. It was also different from observing classrooms as part of the tutor role, where the focus is on the trainee teacher rather than on an experienced teacher. Such opportunities, for university tutors to observe a 'real' lesson by an experienced teacher are actually limited. It also appears that the actual practice offered more than the knowledge encapsulated in a training course. This, the tutor felt, lies in the fact that the practices and skills in real practice have been developed by teachers over years of experience in the profession. In this way she felt that not only the trainees but also she herself had learnt from observing an experienced teacher. In this university tutors' words, however, was not implied that the one (craft knowledge, actual practice) was more important than the other (training and generic topics) in the course, nor that the two were conflicting elements. On the contrary, the Science subject tutor's words conveyed the meaning that when the two elements 'meet' together to inform one another, the process of teaching and learning emerge with much more confidence. For example, she claimed that she would be using the knowledge and examples of how an experienced teacher organised and managed her class at her university sessions.

In fact, another university tutor in English validated the bridging of the university and schools' learning as one of the most important on-going goals of the course. In effect, the two university tutors had seen the value of video

conference not only in empowering them pedagogically but also in providing new meaningful teaching and learning opportunities on the course. In fact, the Science subject tutor argued that the video conferences offered an excellent way of teaching at the university because they provided a real-world context for engaging into discussion, enquiring, and reflection which were considered useful for the professional development of the trainees.

'S: I think that there is a lot of potential [with the video conferences for remote classroom observation] because we [university tutors] usually look at professional development of students [trainees] to become teachers and the best way to do that I think is really to look at good teachers teaching and to have the opportunity to talk to those teachers and to talk to those pupils, is I think that an excellent way of teaching'

[Interview with a Science subject tutor after VC3]

4.8.7 Positive outcomes for the pupils in schools

'M [Experienced teacher]: And for the children is the reporting back which is a very big skill in science, so they can report back. Confidence levels will be improved... talking for a different audience, they'll have to possess that kind of talking to an audience skill so all of them are very important life skills that the children could benefit from, from my experience'

[Interview with the experienced teacher after VC3]

A number of educational outcomes of the video conferences were reported from this experienced teacher for her Year Six pupils which were contributing to developing their presentation skills and in giving feedback of their work towards a real audience beyond the 'familiar' teacher, which she thought of as very important life skills. Specifically, in this way they could also build up their confidence levels since they were able to consolidate what they had done in the activity without being apprehensive because of the camera or by others watching them and also at the end to report back on their work to this diverse audience. The Science subject tutor argued it could be that this learning enquiry, asking pupils about their learning by the end of their lesson, for example: 'Did you learn? What did you learn? Did you learn more by doing this? And, how do you know what you have learnt?' that could have helped the pupils in the classroom. Especially for these pupils in Year Six it could have helped raise their awareness of their learning or their preferred methods of learning.

Another experienced teacher after VC1 explained that her pupils felt proud that they were ambassadors of primary teaching and therefore they worked very hard. Even after the video conferencing they kept working hard because they wanted to create their own projects and type them up and sent them to the university for the trainees to see. She also argued that some of them felt that they were doing something special and they went home and told their parents.

In addition to the educational outcomes, the experienced teachers also reported other outcomes that emerged for the pupils, including social outcomes, that it was beneficial having seen 'live' all these adult 'students' in another place who were learning how to be teachers and they wanted to ask them questions. A trainee thought that video conferencing could also help them in the knowledge that they were preparing the next set of teachers. Also some trainees felt that the video conferencing raised children's awareness of higher education and the world outside a schools' classroom.

Moreover, a number of trainees thought there were possibly some behavioural management outcomes because of the video conferences. For example they argued that it was possibly that video conferencing had motivated pupils to behave and hence achieve more. In fact, during group interviews trainees stated being impressed by the children's behaviour and concentration time on tasks. This was because from their personal experience, they knew that pupils do misbehave sometimes and especially for the younger pupils in the foundation stage that they concentrate for a short period of time, for example on the carpet. However as the experienced teachers argued, it was possible that video conferencing made them feel quite more excited.

4.8.8 Positive outcomes for the teachers and primary schools

'S [University tutor]: I think in a way when students [trainees] ask the questions I think the teacher also would have thought more about her own classroom practice seeing from someone else's perspective and having that opportunity to interact. It is always useful [...]'

[Interview with a Science subject tutor after VC3]

A number of trainees and university tutors thought that the reflective element of the video conferencing was most of all valuable for the experienced teachers since they were asked to think back on their own classroom practices to indicate what they could do differently and how they would feel about their lessons. Cross-checking the data, it was found that although the experienced teachers had delivered their lessons as they usually would have done if nobody was watching them, they recognised a positive input of the video conferencing on their own professional development. In fact, an experienced teacher expressed her desire to watch the video of herself teaching, since she never put herself into that position of watching herself teach; she recognised that it could be a good professional developmental opportunity, since it could help her in reflecting on her practices and possibly in changing something about her teaching.

Since two of the video conferences of this research were organised with the support of a LEA Consultant, it was particularly interesting eliciting his views on

the purposes for pursuing the video conferences. He said that they were currently trying to balance together two models of video conferencing, which were delivering content from schools, and content coming in to schools. Therefore, from the Local Authority's point of view a potential funded cooperation with higher education institutions could nurture mutual beneficial outcomes for all involved participants, schools and institutions. Along similar lines, a university tutor argued that video conferences between university institutions and schools could fit in with the schools' developmental plans as well as with the university's goals. For example if a school's priorities are speaking and listening then video conferencing could provide a real audience for the pupils to interact and assist them in developing their skills. At the same time, trainees could receive training and gain examples of teaching from all over the UK and as a result in the long term, schools could take in a better-prepared teaching staff. The Consultant also suggested that trainees could in turn prepare and deliver lessons to the pupils at schools at a distance of over hundreds of miles away. According to the experienced teacher, trainees could develop different skills by teaching using video conferencing than teaching in a classroom. Further, they could take on a more proactive role during the remote classroom observations by preparing something to give back to the pupils by the end of the lesson.

4.9 Models of use

Adopting the four models of the use of video conferencing at UK schools identified by Lawson and Comber (2010: 319), which are '*familiarisation*', '*substitution*', '*enhancement*' and '*adaptation*', and attempting to map them onto the use of video conferences for remote classroom observation in the teacher education context, may bring here an understanding of the nexus of the affordances and limitations of video conferencing depending on its use, as those are seen through the eyes of the research participants.

4.9.1 Familiarisation

'M [University tutor]: [...] so in the moment when we tried it out [VC1] last Thursday it was very much the case of: 'Well, we've never tried this before' and there was a certain experimental aspect to it. There was an attempt to make it purposeful [...]'

[Interview with an English subject tutor after VC1]

This model of usage is associated with the initial attempts in the process of employing video conferencing as a pedagogical tool in a learning context (Lawson and Comber, 2010). In this case, a number of trainees and university tutors, as shown above, as well as the experienced teacher who delivered the first 'live' lesson at a distance showed an awareness of the experimental aspect

of the VC1 in the specific PGCE course. Thus, even though they reported that video conferencing was seen valuable as an end in itself, they did not like the fact that they became aware that there was a deliberate attempt to make it purposeful. Further, there was a lack of confidence in the use of the technologies and a feeling of uncertainty and uneasiness associated with inexperience in participating in a new learning environment conveyed in this VC1. Especially for the university tutor, there was an underpinning scope of seeing everything under a critical eye in order to use video conferencing more effectively on the second and third attempt. A number of trainees admitted that predominantly the innovative nature of the VC1 spurred their interest rather than a belief that it may bring a pedagogical value to them on a personal level. Some voices in the interviews, in particular from the trainees, said that they needed to have a pre-defined purpose during the video conferencing.

Finally, a university tutor said that when the technologies could be set in place to work like clockwork, video conferencing would realise its scope. Nevertheless, it is important to bear in mind that familiarisation is a basic stage for moving to other models of use. Explicitly, an English subject tutor although acknowledging that VC1 was more the case of *'well, we've never tried this before'* said that her purpose was to use video conferencing as a tool for meeting the existing curriculum which is regarded as a substitution model.

4.9.2 Substitution

'S [University tutor]: [...] There are benefits certainly from my point of you seeing how science was taught without walking to a school [...]

[Interview with a Science subject tutor after VC3]

This model of usage is related to the use of the video conference without disrupting the typical practices of the specific learning environment, that its purpose is to deliver the same curriculum via video conferencing (Lawson and Comber, 2010). In fact, the English subject tutor had initially seen video conferencing as another means for implementing classroom observation. This is highly valued for the professional development of the trainees because it involves observing experienced teachers: how they plan, and go about delivering a lesson depending on pupils' needs, which unexpected issues may arise in the lesson, how the children respond and myriad other issues conveyed in a teaching act. Hence, organising video conferencing reflected some of the things she was planning to do. She had seen video conferencing as a medium for achieving her planning task in a potentially quicker way than organising a focus day at schools which involved meeting the teachers at the university beforehand and engaging in a discussion on what their focus might be and how to meet their goal and later sending the trainees over to the schools to observe a lesson. Although some trainees suggested having a video link with a special school where they would access a completely different environment to

the one they were typically prepared to cope with, it was still another observation to do.

The participants who saw video conferencing on a substitution level kept comparing their experience to the actual situation of physically being in the classroom which they found more advantageous because in the classroom they could scan around, get involved and develop relationships with the children. Nonetheless, the Science subject tutor underlined that video conferences will have a role in assisting the transition of trainees *'but it will have to be with physical attendance in classes'*. She added that it depends on what you are looking for, for example if you are looking to see the dynamics of a classroom those could not be captured online. Hence taking into account in what ways video conferencing enhanced the traditional way of teaching and learning in the PGCE course rather than substitution some of the things they were talking about fitted more with an enhancement model of use.

4.9.3 Enhancement

'M [University tutor]: [...] I think that issues always are how integrated all is, how aligning to the learning objectives are, did the video conference do the job I hoped to do, did the video conference fit with the particular task I was hoping [...]? I supposed it's a tool. It's very much about like any other tool, isn't? So it has to be done in a way that it complements what we are doing [...]'

[Interview with an English subject tutor after VC1]

The Enhancement model goes a step further than the two previous models of use because it aims to add value to the actual learning processes although bolted-on to the traditionally delivered approach which is according to Lawson and Comber (2010) the most popular model. In this case, *'bringing more meaning to the actual activities we were doing at the university'* was the reason given by the English subject tutor when prompted to say what her expectations were over the video conferencing. She also underlined that the video conference's purpose had to be aligned to the learning objectives of the course, as is illustrated above.

Other voices from the interviews also verified that video conferencing enhanced what they were doing at the university in various ways: first of all, it was about the logistics, it was rather easier to have a large group of trainees observing a lesson rather than having all of them walking into a school or a number of schools. Secondly, it was an unobtrusive tool for making an observation because the distance afforded via video conferencing made them feel more at ease and also there was the opportunity for interaction between the two sites, university and the school. Thirdly, it was the group situation of having everyone to observe the same lesson and having a common basis for discussion for sharing different perspectives of a single lesson. Next, it provided a real world context for understanding the actual exercises at the university rather than an artificial setting that involves imagining children, reading a book, and thinking of learning objectives. It added a practical dimension to what they were learning at the university since the video conferences especially the VC2 and VC3 were

well integrated to the course's curriculum. Additionally, it livened up the lectures, and improved the concentration levels of the trainees. Finally, the Science subject tutor believed that it could enhance her role in guiding and facilitating trainees to think and look at certain elements of teaching and learning that they were focussing on.

4.9.4 Adaptation

'J [Trainee]: Yea I think it [video conference] is really helpful because rather than watching a video of something that they've tried to fit... make the lesson fit. They [university tutors] can actually made a purpose-built lesson around, you know, something that it is actually going on at that time [in a class]'

[Group interview with trainees after VC3]

This model is essentially an explorative approach, distinct from the other three models, in which video conferencing is used for innovative models of learning rather than for delivering traditional pedagogies (Lawson and Comber, 2010). In fact, this trainee in the opening quote and also a university tutor suggested reversing the process of designing for learning at the university by setting their pedagogical agenda based on real-world observations rather than the other way round; that is setting an agenda and then making observations, trying to gather as much information as possible about the pre-defined agenda.

In fact, originally the integration of video conferencing in this case sought in the adaptation model of use for promoting new practices in the PGCE course. The analysis of the results supports that this was achieved. It appears that video conferencing promoted new practices or/and new learning environments that empowered the connections between the two elements of the course, the university and school learning. It enabled the bringing together of trainees, university tutors, experienced teachers and pupils at schools in a virtual platform that enabled real time interaction, collaborative reflection and discussion.

Foremost, for a number of trainees who were on the overlap of the two communities operating in two distinct communities throughout the course and experiencing some difficulties in moving between the two communities, it was found that video conferences assisted in developing a better understanding of what was expected of them. It was argued by some trainees that by watching a live lesson helped in practically projecting something in order to better 'make sense' the university learning in a real context. It was noteworthy that video conferences interrupted the traditional practices, since with the video conference none of them, neither the trainees nor the university tutors, could see the lessons in advance therefore they were in a position of observing and drawing upon authentic captures of classroom practice and life which were transmitted directly to the university as they happened.

Finally, the Science subject tutor also believed that video conferencing enhances the possibilities for online teacher education. In her opinion in such attempts without video conference, usually participants have a lack of opportunity to interact and for that reason may drop out of a course they are in whereas video conference could fill the gap by providing oral communication and interaction with others (peers, university tutors, and experienced teachers).

The following graphic, Figure 4.9, attempts to present the points made in this subsection on the potential models of use of video conferencing in a teacher education context as those which were adapted by Comber and Lawson (2010: 319). The concluding section will consider the implications of both multi-point video conferences and video conferences for remote classroom observations.

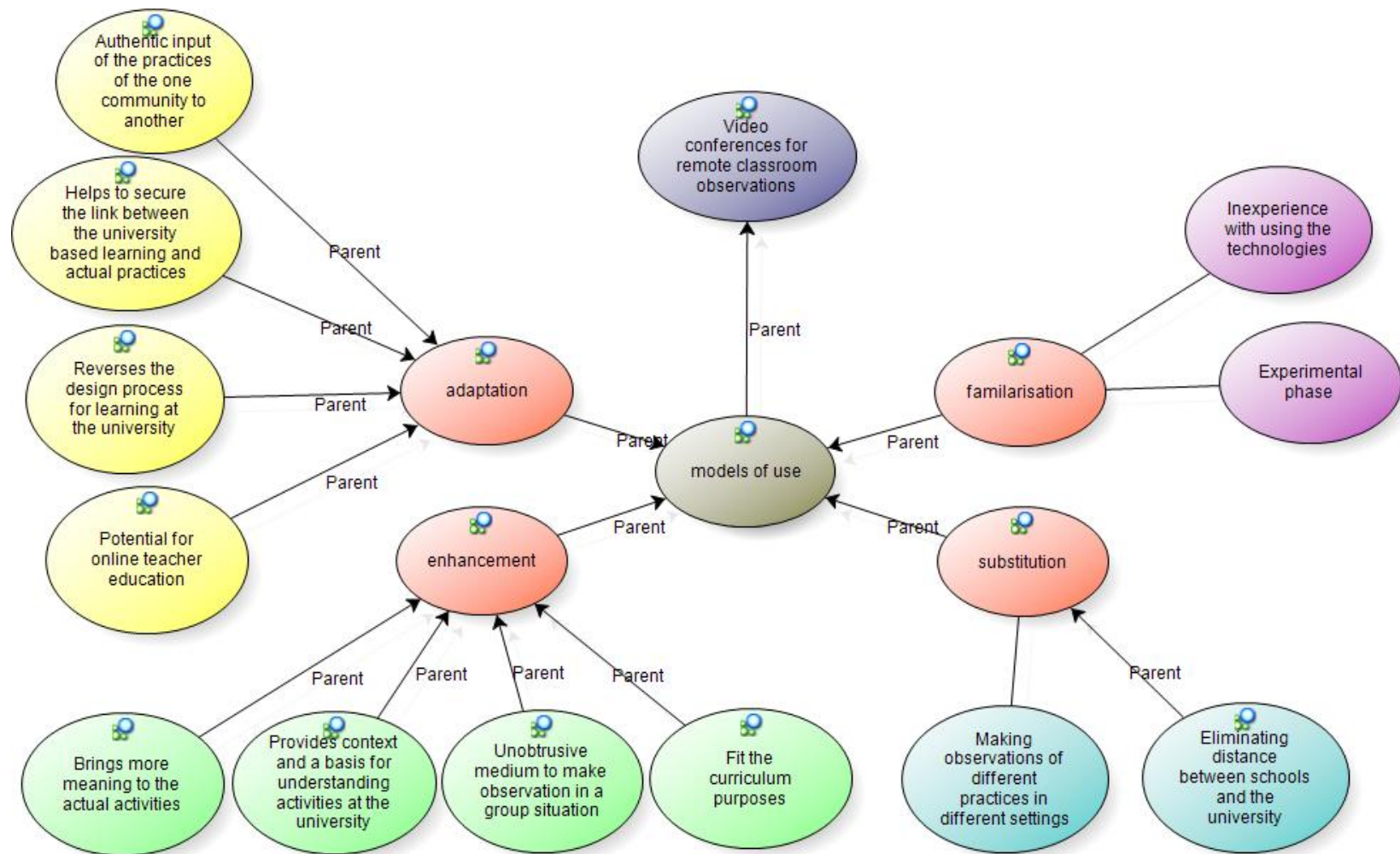


Figure 4.9: Models of video conferencing use in the Primary PGCE course [adapted from Comber and Lawson (2010: 319)]

4.10 Summary of findings: Implications of the video conferences

The two research schemes or the two forms of video conference, multi-point and many-to-many video conferences were integrated throughout the course for a number of trainees whilst on TEs and on-campus respectively. In this analysis, it has emerged that they were found to be a partial answer to some apparently oppositional situations on the course: those of presence and distance not only physically but also socially and emotionally for a number of trainees, and those of craft knowledge of the profession and training.

The two elements of the course, university and school, which represent craft knowledge of the profession and training rather than theory and practice are thought to 'divide'. What was discovered in this study, was that although they are sometimes conflicting, they are essentially overlapping and to an extent complementary. Video conference as a tool appeared to contribute in bridging the two elements of the course together in a variety of meaningful and practical ways. Hence, it could be argued that video conferences sit on the overlap of the university and schools' learning.

The principal ways through which the video conferences facilitated the process of establishing these connections between the university and schools were its

nature to be synchronous and immediate and to enable voice and visual communication over the internet. However, beyond these technical features of video conference, it was predominately the aptitudes and willingness of the majority of trainees, university tutors and experienced teachers involved to 'open up' their practices, share their experiences and engage into a dialogue, collective reflection, enquiring and self-reflection which enabled connections between the two 'worlds' throughout the course.

In this way, social constructivism in action was facilitated via video conferences as a number of trainees were exchanging, discussing and 'comparing notes': on their experiences as those happened at schools, with their peers, as well as on their remote classroom observations on lessons as they happened, with university tutors, experienced teachers and peers on-campus. In both instances, the meaningful real-world context upon which reflections, questions, discussions and conclusions were drawn, along with the real-time effect of the video conferences, rather than a retrospective reflection and discussion on artificial settings play a very useful role in the trainees' professional development. It seems that learning from each other and with each other was promoted with both types of video conferences.

As a result, the majority of trainees were supported to intuitively 'make sense' of the university learning and coursework in the school context and vice versa, to deconstruct and re-construct a classroom environment based on the knowledge

gained at the university. Hence, with the use of the video conference a number of trainees were enabled both on-campus and on TEs to draw connections between their experiences, learning, activities and practices that took place at the schools and at the university and even between their twin identities as trainees and as teachers.

Explicitly, on TEs, a number of trainees were enabled to communicate via video conferencing their struggles and worries that were inappropriate or 'difficult' to be expressed at the school setting or in front of a university tutor, their endeavours in orchestrating their twin identities, balance their roles as teachers and trainees and their successes and future plans. Their university community seemed to 'follow' them online as those were peripheral members of their school community. Their hectic everyday lives that they somehow shared with some '*ups and downs*' of moving in and out of their school community had changed with the use of video conference. For a number of trainees for an hour at the end of their day, from the comfort of their homes without any cost or travelling and without any effort they could just see '*familiar faces*' their friends and peers with whom they could just offload their concerns.

In this way, multi-point video conferences appeared to create a 'social presence' effect for a number of trainees through peer support whilst on TEs for overcoming social and emotional feelings of loneliness. Also the 'social presence' effect was created through many-to-many video conferences by

receiving authentic input from the school community to their university community for minimising feelings of losing touch with classroom environment, pupils and schools whilst on-campus. Thus, a number of trainees reported that video conferences contributed to both defusing a quite stressful and demanding period of time at schools by *'having a laugh'* with peers, and a quite intensive period of time at the university where they claimed they were receiving input which was difficult to relate to the actual practice, by observing and participating in a 'live' link with local and distant schools.

It seemed that with video conferences opportunities were augmented for the trainees to increasingly take responsibility of their own learning and identity transformation to become reflective teachers. In particular, they took ownership of their pedagogical, reflective and social agenda with peers on multi-point video conferences and could contribute to defining the under-examination agenda at the university after the remote classroom observation. As a university tutor argued *'none of [them] have seen the lesson in advance'*. This means that university tutors' role had changed from controlling a pre-defined agenda to one of guiding and facilitating trainees to draw their own conclusions upon an as-it-happens agenda.

In video conferences for remote classroom observation, it seemed that the expertise of the participating university tutors and experienced teachers combined with the evolving knowledge and experience of the trainees and

pupils at schools were 'met' in a cooperative virtual learning platform. All involved participants appeared to have benefitted from this experience. For the trainees they acquired a better understanding of what was expected from them in order to become teachers, not only by observing an experienced teacher in action but also by seeking advice and asking questions directed both to the experienced teachers and university tutors. It was argued by a Science subject tutor that an important habit for the trainees to develop at the initial stages in the course was to turn outwards from their own personal concerns about their competencies, to thinking about their pupils and their teaching.

For the pupils in schools this enabled them to articulate what they had understood about their learning. The pupils acquired a diverse audience wider than the 'familiar' teacher to develop their life-long skills in communicating the outcomes of their work. For the university tutors, video conferences for remote classroom observations were also found to be pedagogically useful as they could add to their theoretical skills since they learnt from the experienced teachers' craft knowledge. There were, further, mutual beneficial outcomes for the school site as well: the involved teachers were benefitted by their reflective practice and from listening to others' perspectives on their teaching. The potential of such connections between university and schools for teacher education and for pupils and teachers were underlined by the representative from Local Educational Authorities.

To conclude, the integration of both forms of video conferences intertwined was found useful in defusing for a number of trainees the reported '*black or white*' situations on the course. Positive pedagogical outcomes were derived related to developing a teaching identity and enculturation in the teaching profession with the support of peers and university tutors. Also there were social and emotional benefits of feeling a '*part of something bigger*', being a member of a university and at the same time of a Teacher community and one is '*not supposed to be a finished article*' but is learning to be a reflective teacher through socially constructed processes enabled by the utilisation of technological advance.

5 Discussion

5.1 Overview

This chapter considers the plausibility of the research findings against the most relevant corpus of the literature explored in Chapter 2 of this thesis. It also aims to discuss the results of the present study in the context of the four research questions. To remind the reader, the main questions that this research study set out to answer were:

1. How do the trainees experience their identity transformation throughout the course?
2. What is the value of peer communication sustained via video conferencing throughout the PGCE course and especially, during TEs?
3. What is the value of using video conferencing for connecting university with school communities for the training of primary trainees?
4. How does video conferencing support the overlapping element of trainees' experience at the university and schools?

This thesis sought to gain insights into the feelings, thoughts, personal experiences and perceived outcomes of the video conferencing experiences from the perspectives of the trainees, university tutors and experienced teachers involved in this research. Empirical evidence emerged through the content analysis of the trainees' discourses via multi-point video conferences

and through group interviews with university tutors and trainees. In this way, data were cross-checked by methods and sources, and interpretations were enhanced. These understandings enabled an exploration of the potential of video conferencing as an integrated technological tool not simply for eliminating distances and enabling interactions, but as to whether and where it could contribute to the process of 'becoming a teacher'. Each of the following sections addresses separately each one of the research questions.

5.2 Question 1: Identity transformation throughout the course

Considering that the majority of trainees admitted feeling like being on a '*learning curve*', like meeting '*a transition*' and having '*never learnt so much in [their] lives*' during their time at the course, reveals the intensity of such a school-based training. This was because they experienced a transformation of their identities from trainees to teachers and developed a sense of belonging in the community of Teachers through this learning transition which is, according to Wenger (1998b), the vehicle for the inclusion of newcomers in a CoP. The university tutors confirmed that they expected and facilitated the process for the trainees to shift their identities towards thinking of themselves as teachers who would have classes of their own in a year's time.

The trainees' discourses via video conferencing and group interviews provided a deep insight on what enabled access from the one CoP into the other, from

the community of trainees to the community of Teachers. Initially, *legitimate peripheral participation* activities including paired work at schools with peer partners, observations, and questioning the practices of experienced teachers assisted trainees to familiarise themselves with the profession, with the routines, rules of the school and the various ways the teachers acted in practice and the reasons they gave for explaining their actions. Those activities were particularly taking place during TE1 and at the beginning of TE2 because later on, in particular, on TE3 they progressively undertook all the responsibilities of a teacher.

However, it has been pointed out in the discussion of a number of trainees during the group interviews that those activities and the experiences they had at schools were not the same for every one of them. It was argued that their teacher mentors at schools played a key role in how they engaged emotionally with their training - anxious, confident, intimidated. They arrived on the course coming from a variety of different disciplines with a variety of different competencies hence, each one of them had their own unique starting point. Similar conclusions are drawn by Barab and Duffy (2000) and Malderez et al. (2007) who provide evidence that in teacher education of a diverse group of trainees who enrol in a teacher education course, they come together with a common starting point and a need to undergo a pedagogical transformation. However, for the majority of trainees in this study there was a common feeling that they were all there for the same reason and that the course was seen as a

journey rather than as a prescribed path or a route taken and therefore they claimed that they were happy to help one another.

In the process of becoming teachers, the trainees also appreciated the 'distance', the support and the time they were provided at schools to '*step back*' and observe experienced teachers' work before meeting their own personal goals including teaching a whole day at a school. At the same time, they appreciated the legitimacy they were provided to '*try out*' their own ideas in a classroom, test their own ways, their practices and learn from their own mistakes. For this, Baek and Barab (2005: 163) argue that the identity formation is enabled 'through the mix of *participation* and *non-participation* – as an insider (full participation in CoP), or an outsider (full non-participation in CoP)'. In this way, the majority of trainees both gained understandings of what it is like to be a teacher, immersing themselves in the teaching community by engaging in its practices, and they were provided space to experiment with their own practices and develop their own identities as the new generation of teachers. Consistent with Wenger (1998b) this can be seen as a duality of *continuity* and *discontinuity* of teaching practice representing the conditions of accommodating themselves to the profession's routines and practices, as well as introducing their own ways of doing it, thus developing their unique identities. In fact, their practices and identities were the two aspects of their professional development in which they sought identity which was about how they perceived themselves, what they understood themselves to be, how learning changed who they were; and practices, (skills, competencies) which was about what they could perceive

themselves to be able to do, and how learning changed the ways they engaged in action.

These findings are consistent with Kelly et al.'s (2007: 154) suggestion that in the 'movement from peripheral towards full participation people adopt different stances towards the tasks in which they engage, they position themselves differently and are positioned differently by others, and so they change identity'. In a similar way, the majority of trainees' identities and practices were affected through the multiple interactions they had with other people - mentors, university tutors, peers, and with pupils at schools. Explicitly, they started feeling satisfied when positive comments, remarks, and implicit clues were received by their tutors and their mentors about their progress and on how much they changed which boosted their confidence levels towards seeing themselves in the role of the teachers. On the other hand, they admitted feeling disappointed and overwhelmed when for example, a couple of pupils at schools showed their lack of interest during their lessons which resulted in having low confidence in their identity as teachers or even in their ability to become teachers. Hence, although the majority of trainees resided on *inbound trajectories* representing conditions of successfully moving in the community as core members some other were heading out of the community of Teachers, residing on an *outbound trajectory* (Wenger, 1998b).

Importantly, their peer interactions and support also played a key role on their development and on how they came to perceive themselves as teachers, for three reasons. First of all, the trainees seemed to have a common *shared pedagogical language* which transformed their conversations into informative discussions for exchanging tips, sharing only what was needed to be said and pointing out useful information while cutting out unnecessary, stressful and vague comments. Secondly, they had a *shared repertoire of practice* of going out to schools, having to prepare for the next day at school, taking responsibilities for their pupils' wellbeing and learning, managing folders, filling assessment and lesson planning sheets - which were their *artefacts* - and attending courses at the university. Hence, to a certain extent they knew *what* each other was going through but they wanted to regularly share the *how* they were getting things done, for example how they prepared for their next lesson, how they kept pupils on task; and also, the *whys* which is according to Harrison et al. (2005c) critical reflection on practice. For example, why they chose to use the one strategy rather than the other in their classroom and why they thought they were doing well or not in their training. And thirdly, what brought the trainees together and why their peer interactions were so important for their learning was because of their *temporal dimension of their identity* which meant that they were all in the position of learning the craft of teaching. Hence, the words of a peer: *'[we are] learning and [we are] not supposed to be a finished article'* and that *'once [we] get into teaching then it should take a life of its own'* were definitely reassuring, comforting and encouraging. It is here that video conferencing came to play its role, a subject which will be discussed in the following section. A number of them also exchanged their telephone numbers

for personal communication and a greater number of them became 'friends' on Facebook in an unconscious attempt to keep their peer community active.

Therefore, trainees' participation in their peer CoP and in the CoP of teachers assisted them to become pedagogically thinking teachers. This means that over the time they became more focused on their pupils and their learning – as opposed for example to their own competence and 'getting by'. Explicitly, a number of them felt that they had to '*get [every] child where it has to be*' in their learning, immersing themselves in this way as teachers in the school context. In fact, they preferred taking this position as teachers rather than thinking of the university tasks they had to do to fulfil their roles as students whenever these two identities were considered to be conflicting – *constant struggles* - for example, at times when a task was judged as inapplicable to what the pupils were learning and a dilemma of what comes first, being a teacher or being a trainee, arose. For this reason, the majority of them struggled to find ways to balance the work and requirements of the schools with those of the university and on the contrary, at other times they found that the learning guided by the university tutors and the actual practice at schools enhanced one another and led to *successful resolutions*.

Consequently, reviewing how the trainees experienced themselves in practice through the lenses of CoP approach, a duality of identity is unearthed. Unravelling their two-fold identity, as trainees and teachers respectively, the

fact that the one aspect of this dual identity sometimes enhanced and other times conflicted with the other throughout the course is brought to light. These conclusions add to the body of knowledge (Jyrhämä, 2003: Kynäslähti et al., 2006: Pratt, 2008: Sim, 2006) referring to this dualistic role of being a student and a teacher, which generates the need to realise the goals and expertise of two curricula, that of the university and that of the schools. This study reveals the dilemmas, thoughts, feelings, contrasting positions – complement or clash - and the reflections that the two overlapping and/or conflicting ‘curricula’ caused to a number of trainees. In particular, it was found that they had to find their own individual ways of responding to these conflicts and in some ways of ‘connecting’ the two aspects of their developing identity – referred to as *identity reconciliation* (Wenger, 1998b). According to Wenger (1998b) this work of reconciliation relates to people who ‘move from the one community to another’. Again, within their peer community trainees found the space and support to reflect on the various ways their dual identities and practices came together or at other times produced struggle. Also the dialogue with experts and their own self-reflection assisted in finding ways to balance the two together and forming their own unique identities.

Some of the conflicts faced were due to the lack of the appropriate technologies at the schools, the personal feelings of each trainee towards the usefulness of a task or other situational factors like the type of school posting, the year assigned to them and the learning stage of their pupils at schools. At other times they felt that the time required for fulfilling their role as teachers could not

allow time for accommodating their responsibilities to the university, thus they felt that there was a lack of time to be '*efficient*' at everything. Moreover, at times the current pedagogical trends explored at the university were not reflected in schools nor applications found. Kent (2007) agrees that sometimes the current research-based strategies that the university represents contradict the traditional practices followed by a number of teachers at schools. Sim's study further identifies tensions within the teacher education context between campus-based course work and school-based relevance, for example trainees may regularly see disparities between what they were told and what actually takes place in a classroom. Kynäslähti et al. (2006) referring to this as contradictory influences in schools, argue that sometimes new ideas and 'updating' of the university educational knowledge carried out in schools by trainees found no backing by schools.

On the other hand, Kynäslähti et al. (2006) also mentioned successful diffusions of the practical knowledge of the university in the school context. Similarly, some of the successful resolutions experienced by trainees in this study were the various ways through which the learning that took place at the university overlapped with the learning acquired at schools. The university knowledge informed their practices at schools, for example a number of ideas gained at the course found good applications in practice. Other successful resolutions emerged where university tasks led to effective ways of directing and exploring practices at schools and assisted them in acquiring a pedagogical focus.

The dualities mentioned so far including continuity/discontinuity, constant struggles/successful resolutions which are elements of the same teacher/trainee duality were produced because of trainees *nexus of multimembership* in two overlapping CoPs throughout the course. Consistent with Wenger (1998b), within CoP ‘conflictual areas’ should not be seen as polar dichotomies but rather as dualities of active participation and negotiation in social practice. In this way, the learning transition and identity transformation of trainees was not realised as a smooth path onwards becoming teachers. It was rather perceived as a to and fro journey of receiving experiences that ‘*brings you back down*’ or engendering positive feelings; of having ‘*ups and downs*’ in confidence levels; of facing difficulties and being empowered by expert others. Overall, participating partially in a CoP, while aspiring to join in successive steps as full members, reflection, interaction and relationships developed with significant others – peers, mentors, tutors - and support by the university community led the majority of trainees to acquire/develop a pedagogical identity and pedagogical skills and competencies.

5.3 Question 2: Sustaining peer communities via multi-point video conferencing whilst on TEs

It emerged from this case study that the trainees engaged in the school communities peripherally and moved into more centripetal roles. However they needed to retain their place in the university community for easier transition, for

receiving and providing feedback to assist their development and to share burning issues including enduring a bad lesson, personality clashes with mentors, feeling limited as a teacher and problems related to classroom control that could or could not be discussed in a school context. Thus, video conferencing was employed as a synchronous communication medium for real time discussion on a weekly basis among trainees. In fact, the immediacy, authenticity and directness afforded by the means of video conferencing assisted in sustaining the existing university community of trainees and contributed to bridging the two overlapping communities, university CoP and school CoP, within which trainees were actively engaged. The various ways that video conferencing assisted them to employ techniques to balance their two aspects of identity and achieve their learning trajectories to eventually become teachers are discussed here.

To begin with, the most commonly discussed themes that emerged in the video conferencing meetings are indicated here. The emergent learning agendas of the meetings were flexibly negotiated among the members of the groups even as the meetings ran. According to the trainees' reports during group interviews these issues were shared within a collegial culture of mutual trust and respect which was built initially in face-to-face encounters on-site at the university. The importance of the face-to-face element in a distributed CoP is underlined by Hildreth et al. (2000). It was also borne out by a recent study (Hramiak, 2010) in a PGCE course in which the university learning community was formed prior to its geographical separation, through face-to-face interactions on campus during

group work, tutorials, specialism groups, paired work or traditional courses with the whole cohort group. Subsequently, the community in Hramiak's study (2010) was supported via a Virtual Learning Environment.

In the present research this was the case too, the sense of a community was transferred online aiming to support a sustainable university community of colleagues in the primary PGCE course. A learning community which was initiated in face-to-face sessions was then sustained throughout the TEs irrespective of the geographical separation of the trainees. This is evidenced in the trainees' video conferencing discussions during which the feeling of connectedness and familiarity emerged to the extent that a trainee asserted to another when her webcam failed: *'don't worry I know it's you'*.

The discourse themes were:

1. Diversity of experiences and feelings. The trainees were sharing their own experiences at schools and thus they recorded their own insights related to their experiences. For example, in their discussions they tended to ask each other questions like: *'How did that go?'* *'How did you go about it?'* *'What else have you been doing?'* for catching-up purposes which indicated a level of connectedness between the trainees but this also meant engaging in a process of reflection on practice.

According to Harrison et al. (2005b: 271) part of the process of 'reflection on practice' involves exposing one's 'noticing' to other professionals. For example, in this case trainees shared what worked in their classes, which type of assessment was more efficient for their focus children, how to tailor a task to meet the individual needs of their pupils and how to develop their own teaching styles. This was a form of validation because personal experiences were set alongside other colleagues' experiences (Harrison et al., 2005b). Hence, via video conferencing trainees voiced their anxieties, discomforts, struggles, uncertainties, unhappy and successful experiences and listened to what their peers had to say on their own experiences and feelings. In this process they were reassured to know that others might be struggling as they were; and that they also had some positive experiences. In this process, they reviewed their choice to become teachers and appreciated the wide range of skills needed for being a teacher. Further they exchanged advice on building effective relationships in their schools including interaction, communication, setting targets with the school community, mentors, teaching assistance and staff at school who according to Sim (2006) greatly impact on trainees' development.

2. Short-term plans. Since the meetings took place in the afternoons trainees were sharing planning and programming units of their work to come, for example next-day and/or weekly lesson planning. They had the opportunity to share different issues, daily dilemmas, personal goals and ideas that the teachers may be working on at a given time when the

video conferencing meeting took place. They also talked about their school relationships and communicated ways to develop those further.

3. University tasks. Another theme that they regularly talked about was the assignments, assessments and comments received from their university tutors.
4. Future planning. Other specific topics were job-hunting, and ideas on how they intended to approach teaching in the future.
5. Making social arrangements. Less formal learning also took place and a mixture of professional discourse with socialisation chat led to informal peer discussions. Video conferencing was used for information exchange, arranging nights out, communicating worries at a personal level, and for friendly chat.

These themes coded from trainees' discourses showed some of the most important themes that concerned the trainees whilst on TEs. There were further other sub-categories including differentiation, pupils' assessment, school excursions, special education, school ethics and routines that trainees' considered useful to be shared and discussed.

Interestingly, a themes' progression or change of focus on concerns of the trainees throughout their TEs could be identified. Explicitly, as is revealed from

the video conferencing discourses on TE1, the trainees' concerns had been initially related to their orientation in the course and especially in schools, on receiving information, interviewing teachers and exploring and understanding teaching competencies and tasks which they were expected to develop or fulfil throughout the course. The Concerns Based Adoption Model (CBAM) by Hord et al. (1987: 31) might be referenced, in which teachers' concerns while undergoing professional development are initially related to *awareness*, *informational*, *personal* and *management* issues addressing questions like 'What I will do? What are the details? I need to know more' and 'How will it affect me?' and 'How will I find the time and material to pursue this?'

Since these were the questions that trainees needed answering at the beginning of the course, some trainees suggested that they could benefit from having a pre-defined pedagogical agenda during video discussions during TE1 and perhaps during TE2 because it would be easy to set themes to discuss which concerned them the most. These could include science tasks, English tasks, maths tasks, and then perhaps at the beginning of TE2 planning, differentiation and teaching practices. However, in TE3 they had more diverse experiences to share, about what was being achieved and how they had channelled their ideas in schools to improve their pupils' learning and enjoyment and thus the discussion could be left open.

Hence, it seems that trainees' concerns had moved from themselves to the others, at some point in the course, for some earlier for others later on in the course, which could be associated with the stages of *consequence*, *collaboration* and *refocusing* in CBAM Model (Hord et al., 1987) because here concerns moved to addressing questions like '*How would it affect my students?*' (rather than myself), '*What are my colleagues doing?*' and '*Why don't we consider doing...?*'. Cross-checking the data, it was found that the Science university tutor argued that trainees were usually too busy thinking of themselves in the classroom to really focus on their pupils' learning and talk to them effectively and that it takes time for them to meet this transition. She claimed to be happy when she realised by the end of the course that her trainees' interests had already shifted towards their pupils because they were asking them about their learning and if they had enjoyed a lesson. The various ways that the trainees benefited from sharing with peers the changes they experienced via video conferencing are discussed here.

For a number of trainees, the video conferences provided opportunities to balance the various elements of their dual-identity as teachers and trainees: constant struggles/ successful resolutions, continuity and discontinuity. This happened as they shared their struggles and successes experienced at schools during the three TEs on a weekly basis. Explicitly, at times when they had different views, opinions, and thoughts about what they had to do or when a number of difficulties arose at schools, or conflicts between their roles as teachers and students, the community of peers provided them with a 'safe'

environment to develop their arguments. Sim's study (2006) also suggest that a strong, supporting CoP enables tensions to be examined in a safe, non-threatening environment. In the group interviews, trainees argued that they were provided with the opportunity through video conferencing to discuss how they could have done something differently at schools or amended a task to fit their own purposes – discontinuity of the teaching practices - and what they did not enjoy at schools and/or at the university. Hence, online peer discussions enabled a collective construction of ideas on how to synthesise their experiences, orchestrate with confidence their identities as students and teachers and meet the demands of the university and the demands of their schools. This finding is consistent with Jyrhämä's (2003) argument that trainees needed to hear alternatives of what to do rather than be told, and thus to receive feedback and confirmation to boost their self-confidence.

In fact, a continuous on-going circle of reflection, self-reflection, peer reflection and action and again reflection was facilitated via video conferencing. This means that trainees reflected on their own and on their peers' practices, experiences, and thoughts and importantly they had the opportunity to engage in practice almost instantly - the next day - to amend, change or try something else that peers suggested or emerged through peer discussions and hence make new evaluations and reflections. The nature of video conferencing as synchronous and instant made that possible because there was no need for the trainees to wait until coming back to the university to share reflections with peers. By that time the opportunity to engage again in practice in the same

contexts, with the same pupils, at the same school to experiment with a different approach, strategy or methods would have been lost.

These on-going reflection processes appear to have a role in better understanding of their roles, their competencies, responsibilities and as a result, in contributing in the self-awareness. Explicitly, this was an examination of what went well in the school, what did not go particularly well and why, how could it be changed, what was achieved and what remained to be achieved. According to Kynäslähti et al. (2006: 248) the core idea of this process is a 'kind of metacognition, a discovering process through examining one's own work and decisions concerning one's own teaching'. Dialogue with colleagues aided this understanding of their own experiences and challenged their own decisions and their role in practice (Kynäslähti et al., 2006).

Further, the trainees align their own learning trajectories alongside those of their peers to enable '*getting through*' the TEs and ensuring that they were on the right path to becoming teachers. Explicitly, at times when they shared their feelings and their own perceptions on their progress and how other experts who observed them in action defined their identities, they had the opportunity to receive feedback from their peers too. This seemed useful in re-examining, challenging and/or confirming their thoughts, perceptions and practices. For example, at times trainees shared, during a video conference, their disagreements with comments they received from their university tutor or

mentors about choices they had made during lessons. Trainees provided sympathy with one another along with arguments on how they should adhere to what was expected from them or test and experiment with their own ideas. These opinions were supportive, but not each one of them was necessarily correct in terms of 'who was right'. But this was the essence – what was important was that they were exploring not only the appropriateness of classroom strategies, but also the appropriateness of challenging the views of their more experienced tutors or mentors. Thus, it was this sense of exploration, of 'finding their feet' both pedagogically and in terms of their own independence which seemed critical in this kind of exchange. This in turn was tied to their sense of identity as teacher, as opposed to trainee, since they were beginning to think beyond the university 'line'.

Consistent with Comber (2011: 16-7) this 'combination of self- and peer-evaluation facilitates connection between theory and practice. Observing and evaluating one's own practice alongside that of others forces teachers to confront their self-perceptions as teachers as well as their beliefs about what constitutes effective pedagogy'. These conclusions are echoed in several studies; for example Wheeler et al. (2005: 128) argue that teacher professional identity, which is the representation of the self in the context of teaching practice, 'emerges from an iterative process of reflection on practice through continual evaluation of performance' in this case influenced by engagement within online group discussions via video conferencing. Along similar lines, both Fisher (2007) and Sim (2006) argue that communication is important among

peers for making sense of the changes they would experience during TE, for professional sharing and reflection on practice although the former suggests using technologies for enabling discourse whereas the latter talks about co-present, co-located communities. According to Squire and Johnson (2000) peer communication enables comparisons to be drawn between their learning trajectories and reflection upon each other's different ways of thinking, which is a valuable part of the learning within a community.

In the process of articulating how the trainees felt, a number of connections between what was learnt at the university and at schools emerged. This study reflects Barab et al. (2003: 513) that within 'vibrant, dynamic' communities 'theory and practice became two sides of the same coin' and according to Millwater (2005) theory is embedded in practice, and through narratives the seamless web of theory and practice becomes overt. In fact, there was no clear distinction between talking about theory and experiences at schools, rather *'they [were] blurred'* as some of the trainees reported. A number of them argued in group interviews – and confirmed in their peer discourses - that without realising it they were referring to terms and approaches originally heard at the university as they were talking about their school experiences in order to 'make sense' of their actual experiences, provide pedagogical explanations and produce understandings to what they were learning, observing or experiencing in practice. These included concepts such as assessment for learning ('AfL'), summative assessment, personalisation, 'levels', behaviour management, and differentiation. Further, the nature of the PGCE course was to provide ideas

aiming at specific Year groups and lessons. Hence, at several times in their discourses trainees reminded, suggested or shared with each other ideas originating from university activities which they could use or they had tried in practice.

Thus, for the trainees video conferencing had been a 'place' where they could talk to members of their own community and use a common language and shared repertoire of practice which an external member would not have been able to understand. Worth mentioning here is the statement of Jennings and Bronack (2001: 100) who said that 'as with all collaborative efforts, speaking the same language is important'. This applies in this case since trainees could talk about their 'PDP' (professional development portfolio), 'PPA (planning, preparation, and assessment) time', 'directed tasks', 'assessment grids' and other professional terms without having to explain what these stood for or meant. They could get quickly to the point and share tips, and tricks, advice, ideas and anything that they thought was meaningful to be shared. Hence video conferences were useful from a practical as well as theoretical point of view. Similarly, Sim's study (2006) revealed that communities of trainees tend to have their own ways of doing and talking and foremost they have the same or similar professional goals, experiences and needs: to consider and make meaning out of their learning experiences at the university and at schools. As Sharpe et al. (2003) and Hu et al. (2001) also argue, the trainees knew each other, they were having similar teaching situations to face or were grappling with the same syllabuses and towards meeting the same university work scheme, hence there

was no need to concretise their discussions during multi-point video conferences, they instinctively knew what to talk about. This study reflects that finding.

The difference between this study and Sharpe et al. (2003) is that the latter was intended to employ video conferences as substitutes for supervision sessions, where trainees in this study were working independently of the tutor within peer CoP as a part of the formal university course. This happened not because university tutors were deliberately left out, but because work overload and technical glitches did not allow the university tutor involved in this study to contribute to the video conferences. As a result, the study explored peer meetings whilst on TEs and revealed that the majority of the trainees felt that there were aspects of their experiences that they would not necessarily like to share with the university tutors and thus they liked that they got to share these thoughts only with peers. Thus an unplanned circumstance had actually turned out to be beneficial.

Consequently, another main outcome of the video conferencing for the trainees above its practical and pedagogical contribution was the social and emotional support. Trainees were enabled to provide reassurance to one another of the type: *'we're all together in this', '[we] will get through', and '[we] are in the same boat'* of learning how to teach. A number of the trainees experienced similar levels of stress to one another while others were more relaxed and confident.

However, the majority of them shared similar everyday routines although there were also unexpected issues, successes or progress at a personal level that they chose to share regularly via video conferencing. It was another medium to expand their community's interactions in real-time when on TE. They thus considered their peers as their own personal support network which neither included all the trainees on the course nor represented a homogenous group of people. During video conferences, they tolerated disagreements, alternative ideas, suggestions, different attitudes, preferences and levels of expertise and confidence.

As a trainee argued, video conferencing facilitated '*support from a morale point of view*'. Explicitly a group of trainees during an interview agreed that they were experiencing separation from the university group, causing '*black and white situations*' in the course of either being within a university community or a school community and feelings of isolation. They argued that feelings of loneliness were replaced by the opportunities for interaction during video conferences. The more typical lack of opportunity for trainees' reflect and interact with others during the period of continuous time in TEs is also reported in Wright and Cordeaux (1996). In particular all the trainees in the present study repeatedly argued that video conferencing meant '*having a laugh*' with peers, it contributed in '*defusing*' a quite stressful phase on the course during teaching TEs. In fact, during their discussions there was never of shortage of jokes and stories and friendly chat which some of them admitted gave them the 'spark' they sometimes needed to proceed with the rest of the week. It further

reminded them that they were '*part of something bigger, not on [their] own*'. In fact, the trainees argued that when they were at schools they got into their '*own TE bubble*' because they only saw their pupils and mentors at schools each day and tended to forget other people going through similar experiences hence for them the video conferences did '*bring [them] back a bit*'.

The immediacy of the responses and the visual images of the video conferencing communication contributed to this, because it evoked *social presence*, a psychological process in which participants fail to perceive the distance between them and hence feelings of connection were engendered, interaction occurred, and a sense of belonging in a community developed (Wheeler, 2005). Social presence is effective emotionally for the learners at a distance. This is demonstrated by trainees in this study who reported that just seeing each other's faces via video conferencing was enough to lift their spirits.

Fisher et al. (2007) argues that the communities of trainees, even if they conform to the requirements of a particular course, are self-organising entities of peers influencing peers. Correspondingly in this study communities of trainees were neither built nor nurtured; rather they were supported via video conferencing when physically apart. The participation in the communities was on a voluntary basis, for support and for acquiring enhanced professional development opportunities. Trainees were connected in terms of their preference times, interests and with any participants they wanted to meet

online. Finally, video conferences were easily fitted into their busy lives and they could connect from their homes rather than from their schools as in some previous research (Sharpe et al., 2003; Pratt, 2008) which reported facing problems with schools' firewalls.

These multi-point video conferences that took place when trainees were on TEs in combination with the video conferences for remote classroom observation that took place when trainees were on campus had a contribution to make in the process of bringing together the two overlapping and interrelated communities, teaching CoP (representing the craft of teaching) and university CoP of peers and university tutors. Video conferencing for remote classroom observations is the focus of the next section.

5.4 Question 3: Remote classroom observations via video conferencing whilst at the university

Just as a number of the involved trainees reported their gratitude for not being detached from their university community when on TEs, trainees were grateful for not *'losing touch with children'* when on campus, due to the integration of the video conferencing in the course. A trainee captured the value of the video conferencing in the course in the phrase: *'it's about this balance'* of taking information in, discussing, reflecting and developing skills needed in the classroom; for those to happen authentic contributions from two CoPs were

required. This section focuses on the pedagogical impact of the authentic input provided from the one CoP directly and unedited to the other via many-to-many video conferences (school classrooms with university groups) for the trainees' professional development.

The majority of trainees underlined the authenticity of such events - the value of unscripted as-it-happens classroom practice transmitted from the school community to the university community by the means of video conferencing. In fact, a number of them and their university tutors argued that video conferencing was different from the case of using professional videos for pedagogical purposes, since in the prepared video recordings they are always aware that there must be an input from a video director who selects video segments of a classroom practice to make public. Comber (2011) adds that specific episodes pre-selected by a tutor will have been almost certainly chosen to illustrate some particular pedagogical issue. Thus, video conferences provided opportunities for making real classroom observations apart from the traditional way of walking into a school. Of foremost importance, the classroom observation could take place in the university community through direct links with primary schools in the UK. In other words, trainees situated on campus in a group situation with peers and university tutors received authentic video and sound input of the community they were training to join.

Hence, the majority of the trainees appreciated the 'situated learning' element of the video conferencing experience which is also echoed in Comber (2011); the fact that they were 'exposed' to the real practices of a school community. Consistent with Comber (2011) nobody can actually 'stop the action' during video conferencing and there is the element of the unknown about what is going to happen next in an everyday lesson that makes the experience real. In a similar way, Haldane (2005) argues that there is an element of risk that something could go wrong in the class. Trainees in this study admitted that they may not wish anything to go wrong but that it might added a feeling of observed reality rather than a contrived environment. A number of trainees thought that it made the observation stimulating and interesting and it raised attentiveness since it could only be watched in real time. Thus, most of the trainees mentioned that they appreciated that they got to see '*the whole picture... the real picture*' of what actually happens in the classroom from the beginning of a lesson to the end rather than in short segments of classroom life. Thus, they could see what it is like to be a teacher, what unexpected issues can arise and how many different skills are required to handle a variety of different situations in a classroom and facilitate a lesson to run smoothly.

During video conferences, even the PGCE English supplementary university tutor argued that she was alert for things that she wanted to 'pull out' for her lessons. The PGCE Science university tutor said that her role in this process had been 'facilitating and asking open-ended questions to make sure that trainees were focusing on certain elements' and guiding to make sure that the

objectives the video conferencing were met, rather than instructing. The roles of the tutors in this context shifted significantly to the site of the learners – certainly, they were looking teaching situations under an expert eye but still as learners - because not only the trainees but also they themselves were gaining insights into the craft of teaching by the real experts in schools, the experienced teachers. University tutors had the opportunity to demonstrate in this situation the model of being life-long learners who engage in constructive exploration of professionalism knowledge with other experts and also linking effectively the actual practice with the pedagogy. O'Connor et al. (2007) also argue that the expert eye of the university tutor can guide trainees through highlights of the lesson that would otherwise go unnoticed by inexperienced observers. The PGCE English supplementary university tutor similarly recognised that trainees may not see automatically what she sees, thus she argued that an observational focus handed in before the meeting is useful.

Added to this, the value of everyone '*seeing the same thing*', the same classroom practice in a group situation had enabled social constructivism in action because they were sharing reflections and insights with a common observational basis, and learning from each others' questions and exploring each others' ways of thinking and observational skills. This is important because as Hatch and Grossman (2009) identified there are limited opportunities for trainees and university tutors to observe and discuss the same practice at schools, hence so far, classroom observation remained mainly an individual and idiosyncratic process. During a video conferencing event it was

possible for the trainees to have colleagues and their university tutors working together in exploring teaching practices which helped to draw attention to aspects of the teaching interaction that one observer notices and the other fails to notice. As Scordias and Morris's (2005) and Haldane's (2005) studies confirm, this process facilitates mutual engagement in examination of implicit clues, adaptations, planning, thinking and reasoning conveyed in the teaching act. Recent studies by Haldane (2005), Coyle (2004) and Marsh et al. (2010) suggest video conferencing as an effective medium for facilitating reflection on authentic TEs for both the trainees and experienced teachers.

Consistent with Harrison et al. (2005b: 271) experts can 'assist the new teacher in identifying what is noticed [during observations] and in establishing connections with other events and taken for granted pedagogical practices'. In fact, a trainee seemed confident enough to question the experienced teacher whether her methods used were the best way to teach phonics, although it is expected for all schools in the UK to follow the specific national framework on phonics. Perhaps the distance afforded by the technologies enabled trainees to challenge even the more established pedagogical methods. As a result, opportunities for co-enquiry of thoughts, issues and choices taken at a given time appeared to create a culture of reflecting critically on what was observed. According to the PGCE Science university tutor, during a video conferencing in her presence her trainees would ideally remember what they were doing in the sessions and then she could ask them to compare, match or contrast what they were doing to what they observed, to see how several methods or practices

work and think alternative ways of pursuing a lesson and draw conclusions on what they would personally do.

The PGCE English university tutor argued that video conferencing 'is the connection of what [they] lecture [at the university] and the actual practice, the generic topics here, and actual schools and actual practice'. She further argued that video conferencing supported the pedagogical endeavours of the course in a potentially much quicker and practical way than conventional instruction but also in a more meaningful way because it assisted the contextualisation of the training. She explained that usually planning a lesson involves expecting the trainees to think about a classroom context, imagine classroom interactions and activities, read something from a book and discuss it, which is an artificial setting of examining a pedagogical matter. On the other hand the exploration and understanding of a pedagogical concept via video conferencing takes place in context. Explicitly, the trainees can talk about a pedagogical practice or concept, observe a class and then deconstruct or unpick it, analyse that or any other pedagogical concept or practice in the specific context. They can also 'interview' the involved participants, interacting with real practitioners and pupils and then construct new ideas, thoughts and knowledge based on what they observed and explored.

The findings of this study concur with those of Lehman and Richardson (2007) that video conferencing lends credibility to the university content. The majority

of trainees argued that better understandings and connections between what they were talking about at the university and the actual practice that takes place at schools were gained. Comber (2011) names video conferencing as a tool to 'bridge the gap' between campus-based learning and school-based learning during a critical phase in the course when trainees are required to make the transition from trainees to teachers. Kent (2007) agrees that it facilitates the transfer of learning from the university setting to the classroom application, and Marsh et al. (2010: 747) argue in reverse, that it brings 'the practical learning of the school classroom into the university setting'. In fact, trainees having the opportunity to 'access' real practitioners' work and develop insights into their work and at the same time having university tutors' and peers' thoughts expressed about the observed lesson can contribute to forging links between university and school experts' thinking, knowledge and experiences. Follow-up lessons can assist trainees to synthesise their learning (Kent, 2007).

Further, video conferences provided opportunities to gain observations from diverse local and distant schools and by a number of different teachers, hence seeing '*current ways of teaching and also different teaching styles*'. Trainees connected the ideas of experienced teachers who had developed their craft knowledge in their careers, to their own experiences and perceptions of what they could achieve in the future. Trainees also identified that it entailed pedagogical and critical thinking processes to judge the transferability of a teaching practice, approach or method to other contexts.

Moreover, the integration of technological tools to facilitate their own learning in a meaningful and innovative way provided a stimulus for trainees to become technologically literate teachers, which is an important aspect of their training. A number of trainees claimed that they acquired first-hand experiences and learned about videoconferencing technologies applications in order to employ them with confidence in their own teaching practices. These conclusions, making trainees want to use technologies in the future, were also reported by Johnson et al. (2006) and Bryde (2001).

It is clearly delineated in this study by a number of university tutors and trainees that video conferencing is a useful tool depending on its implementation. A PGCE Science university tutor claimed that if they were looking to understand the dynamics of pupils who have social and personal issues, which as teachers they needed to understand, and to develop relationships with these children, then this can only be given by physical presence. Most trainees advocated the use of video conferencing for enhancing and enriching the pedagogical purposes of the course rather than for familiarisation and substitution purposes (Lawson and Comber, 2010). Explicitly, comparing the conventional way of being present in a classroom to video conferencing, they found the latter to be limiting from social, emotional and social aspects. In a similar vein Marsh et al. (2010) claim that video conferencing classroom observations can prepare the trainees quite early in the course for legitimate peripheral participation activities within a school CoP but it should take an enhancing rather a supplementary role.

On the other hand, if video conferencing is used within an enhancement and foremost within an adaptation model of use (Lawson and Comber, 2010) then it could have the potential to contribute in the process of connecting distributed and overlapping communities and hence assist trainees in synthesising their learning and identities from the two communities. The great majority of trainees and university tutors underlined the need for setting clear, tight purposes for the video conferences which are directly related and fitted to the purposes of the course. A few trainees argued that by merely having video conferencing to 'see' a classroom 'live' does not influence at a sufficient depth the process of developing their professional identity. Barab and Duffy (2000) similarly argue that by merely bringing the community into the classroom, in this case at the university, is insufficient. For the trainees' pedagogical development to happen it appears that it requires a reflexive culture of examining practices, developing skills for working in collaborative environments and developing identities congruent to the two communities. In this process trainees could achieve successful resolutions between their trainee and teacher identity. Millwater (2005: 7) agrees that it 'requires communication culture and desire to advance understanding', to build trust, acceptance and a positive environment because 'in giving voice through narrative, people make sense of their world and others'.

A PGCE university tutor supported the view that the value of video conferencing also depends on the prior knowledge and conceptual understandings of the trainees if they were to engage in a deeper level of examining practices. According to Hatch and Grossman (2009: 74) 'interpretation relies on viewer's

knowledge of the relevant context, subject matter and pedagogy as well as the viewer's familiarity'. The importance of prior analysis of themes under investigation are also echoed in Marsh et al.'s study (2010) on the boundaries of a Secondary PGCE course for ICT trainees. In contrast to the attempt in Sutherland et al.'s (2005) study that sought to provide to the trainees legitimate peripheral participation activities on-site at schools, this study's video conferences saved university tutors from dealing with a number of challenges. Sutherland et al.'s study faced certain challenges, including space separation and overloading schools; however a number of organisational issues arose in both studies.

Here, a few contextual factors that were reported in this study which affect video conferences are mentioned and are also linked with previous studies. There were some calendar and scheduling issues, and differences between the school and university calendar (Millwater, 2005), that require a level of flexibility and adaptation (O'Connor et al., 2007) in order to make possible alignments to real CoP (Hung and Tan-Seng, 2004). Assistance, preparation and getting involved as well as having backup plans were reported both in this study and in O'Connor et al. (2007).

The following question is a summary of all the others, pulling together the two conceptual frameworks of this study –CoP and video conferencing – in the

primary PGCE course discussing why video conferencing sits on the overlap of the two CoPs.

5.5 Question 4: Video conferencing sits on the overlap of the two communities

Video conferencing appears to be a partial answer to some apparently oppositional discourses related to the presence and distant situations experienced in the course. It appears to have stimulated an easier transition from trainee to teacher status because of the opportunities provided for discussion, reflection and self-reflection. Specifically there is evidence that this learning trajectory curve was experienced by the trainees as professional development that entailed identity transformation and growing up to the role of the teacher through increasing responsibilities. Hence the majority of the trainees reported that they appreciated any opportunities given for support, empathy, feedback, social presence, advice, tips and understanding of the craft of teaching in the presence of others.

Explicitly, the video conferencing experiences provided opportunities for peer reflection, self-appraisal and social presence when on TEs; and situated learning, contextualisation, social constructivism in action and collective reflection on specific authentic teaching contexts when at the university. In this

processes video conferences made a contribution towards bridging the two overlapping CoPs, teaching community and university community of trainees and university tutors and seemed to enhance the trainees' confidence in drawing together in a successful resolutions their two identities as trainees and teachers. Since the trainees 'reside' on the overlap of the two CoPs for the most part of the course participating mostly peripherally in the two communities moving in and out towards teaching community, video conferences were shown in various ways to assist them in this process.

Explicitly, classroom practice transmitted via video conferencing 'live' to the university meant that none of the participants (university tutors, trainees, experienced teachers) had been able to select beforehand classroom video footages to watch or show to someone. None of the participants could know what would happen next in the lesson even if the one observed was a well pre-planned lesson; and that all the participants including the pupils at the school participated or were witnesses to actual learning situations in progress most of the time with the elements of risk and interest involved. In particular for the trainees, the video conferencing opportunities for observing real-time lessons and acquiring first-hand experiences of 'uncut' classroom life provided situated learning experiences.

Trainees, whilst situated in their university community, with university tutors and peers were simultaneously virtually 'situated' in a teaching context via video

conferencing. They could interact and engage in reflective activities with the experienced teachers and ask or be asked questions from the pupils at the schools, along with university tutors and peers with whom they could discuss, reflect, share and take further their learning issues observed in the school community at a distance. In short, video conferencing appears to sit in the overlap of the two communities as it provided genuine experiences by transmitting virtually local practice of the schools' communities to the heart of the university community.

In addition to the remote classroom observations, online meetings via multi-point video conferencing during placements gathered the greatest interest on the part of trainees due to its impact on supporting their pedagogical, emotional and social status in times of need. The fundamental value of the video conferences on placement was similarly thought to draw connections between the two overlapping CoPs and supporting the interwoven elements of trainees' learning at university, and in workplace learning.

The role of video conferencing lies in part in providing opportunities to expand or merely sustain peer CoP whilst on placements. In fact, working with and alongside others who share the same or similar conditions was something that was valued in the PGCE course and happened with or without the use of the technologies. Hence, in this case, peer support and reflection during video conferences without the presence of university tutors was found to be useful. It

enabled trainees to share their feelings, experiences, thoughts and expectations and set their own meeting agenda on what was intuitively significant to them at the specific time of the video conferences. For the trainees, matching the shifting reality of the actual situations at schools with the learning they acquired during their time at the university, and meeting the demands of being a trainee and of being a teacher at the same time, required developing practices to deal with any challenges and ways to 'live' with the temporal dual identity, and simultaneously to have fun and enjoy a pedagogical journey.

Especially during TE3, in which trainees undertook teaching responsibilities reaching the eighty percent of teaching at schools and the full role of an appointed teacher, they seemed to appreciate having the emotional and social support from people who felt they were going through similar situations and of being '*in the same boat*'. The trainees appeared to have realised a growing confidence in themselves and on the development of their discourse pedagogical skills as they engaged in reflective practice during the time it was needed and grounded in examples of their own teaching and school experiences.

6 Conclusions

6.1 Overview

This chapter initially examines this study's original contribution to knowledge and continues by discussing the possible challenges inherent in the qualitative case study. It also considers the transferability of its findings to other contexts, and proposes directions for future research studies.

This research study has yielded several insights into the pedagogical, social and personal outcomes of two modes of video conferencing interactions, multi-point and many-to-many video conferences, at the heart of the trainees' learning in a primary PGCE course. The originality of this study lies in its focus on new ways of teaching and training via video conferencing, which were shown to enhance the overlapping elements of two communities to which the majority of trainees had allegiance throughout the course. These are the communities of pre-service, and in-service teachers. Thus, this research adds to the body of knowledge (Marsh et al., 2010; Hung and Tan-Seng, 2004; Pratt, 2008) by revealing that video conferencing technologies can support teacher education by bridging participation in two active CoPs, university and schools. However, this study added in-depth evidence on how a number of trainees themselves had experienced the transformation of their dual identity and participation in two CoPs as those were shared among peers via group video conferences and were reported during group interviews.

Joint examination, self- and peer-reflection and support in regard to their immediate personal experiences in schools were all made possible for a number of trainees via synchronous video conferencing technologies during which a gamut of experiences, ideas, thoughts, feelings, beliefs, judgements and views were shared on critical incidents and issues arising from their time at posted schools in other words, issues that are vital, pivotal, significant, pressing and critical. It could be argued that, in the long term, if a number of trainees were enabled throughout this project to develop such social, cooperative and reflective skills in their everyday practices as teachers, those could serve as important elements of their ongoing, life-long professional development. It could be further argued that an understanding of the role of the synchronous technologies such as video conferencing in enabling colleagues to engage in socially active and constructive processes were cultivated through this project. Synchronous technologies could also serve, therefore, as key tools for their future professional development.

Further, video conferences for remote classroom observation offered opportunities for a re-conceptualisation of the teaching and learning environment, for example by changing processes through which the university tutors lead the research agenda. Explicitly, bringing authentic school life directly and unscripted to the university settings via the means of video conferencing provided opportunities for immediate classroom observations where none of the participants (or indeed the tutors) could know how a lesson would proceed. This contributed to the trainees' situated learning experiences, also, as it enabled

a collective reflection in-action and on-action, which according to Schön (1987) means reflection during and after teaching respectively.

The university tutors involved were also actively engaged in this process of 'looking closely' and reflecting during video conferencing. In this way they demonstrated to the trainees how to be life-long learners who take risks and draw connections between their experiences and own expertise with the experiences and craft knowledge of other experts, in this case of practising teachers. Thus, the integration of video conferencing in the course seemed to have expanded the options available for teacher education since it provided diversity of experiences, flexibility in transmitting and blending knowledge between two CoPs, and professional development opportunities for everyone involved.

It is acknowledged in this study that it was difficult, if not impossible, to detach precisely the contribution of the video conferencing in the specific course from other factors, and thus the extent to which the video conferences' outcomes alone had affected the trainees' learning and identities. This is because learning and identity development appeared to be influenced by a nexus of different factors rather than exclusively by one. These factors included the relationships of the trainees with significant others and peers, their personal feelings and thoughts, their background knowledge and ongoing experiences. It should be noted that it was not the aim of this study to compare two groups of trainees,

those who had or had not been using video conferencing (experimental and control group respectively), which might have been a good indication of the precise role of the video conferencing in the course (Bryman and Teevan, 2005). However, even in this quasi-experimental evaluation there are other variables which would have been difficult, if not impossible, to be controlled including each trainee's personality, attitudes and aptitudes. However, this study revealed in-depth evidence on how a number of trainees and university tutors personally perceived the role of the video conferencing in their learning and teaching.

Further, the fact that video conferences appeared to be secure enough environments to enable a number of trainees to talk about their identities, transformation of their identities and learning within their peer CoP, gives a clear indication of the video conferences' role and contribution. This resonates with Harrison et al's point (2005b: 271) that 'exposing one's noticing' and articulating thoughts in front of colleagues is a form of validation because it is associated with aligning one's own experiences with those of others. It is also an action-oriented enquiry, as Harrison et al. (2005b: 289) argue, since it could possibly cause 'changes in practice'. The systematic discussion with peers also involves interpretation since 'an individual teacher chooses to stress some particular features and not others' and it takes 'strong emotional involvement' (Harrison et al., 2005b: 289), in this case in the boundaries of a peer CoP, to be effective as a learning tool.

This chapter seeks to indicate some strengths and critiques of this specific research study starting from issues of transferability of this study to other settings.

6.1.1 Trustworthiness – Transferability

The trustworthiness of this study was pursued by the triangulation of the conclusions reached by the interpretation of the data from different sources and settings. Explicitly, qualitative data collected from the perceptions, feelings, thoughts of the involved trainees were triangulated with those of the university tutors and teachers at schools to provide a deeper understanding of the trainees' professional growth supported by video conferencing technologies. Further, the qualitative data collected from the video conference discourses among peers were triangulated with the data which emerged from the trainees' group interviews.

The qualitative data analysis proceeded concurrently with the data collection. It involved going back and forth between the written transcripts, comparing them and classifying their content into themes according to a concept-driven framework which was formulated based on the CoP theory but also it was reformulated based on the collected raw data for new categories and themes to be added and others to be refined (Miles and Huberman, 1994; Gibbs, 2007). Care was given not to omit meaningful themes or alter the meaning of the

participants' assertions. The original identities of the participants were concealed.

Consequently, this research study explored in-depth the potential of video conferencing for the participants in the specific case, a primary PGCE course in the UK. It was not the intention of this study to pursue evidence for the generalisability of this research data to every teacher education course and for every single trainee, university tutor or experienced teacher. Thus, this qualitative study proposes only fuzzy generalisations to be generated which carry 'the idea of possibility but not certainty' that the results may apply to other similar situations (Bassey, 1999: 46). Judgements depend on the readers and other interested parties: teacher education providers, local educational authorities, schools, higher education institutions, international communities, continued professional development providers, and policy makers, to determine the similarity – and thus transferability - of this PGCE course case to any other case/s. The responsibility is assigned to them to engage in transferring some of the emergent knowledge to other contexts and enter into the discourse contributing to this area (Lincoln and Guba, 1985; Kemmis, 1980). However some of the particularities and peculiarities of this research are indicated in the following section to allow comparisons to be drawn with other present and/or future cases. In parallel, suggestions for ways in which future attempts can be made to cover a number of challenges experienced in this case, are offered in the service of future cases.

6.1.2 Ramifications – Challenges to the research study and lessons learnt

A number of difficulties which are inherent in qualitative research studies and the difficulties of the particular research study including 'limits of interest, relevance/utility, the perceptual limits of observers and participants, the limits of cognition (what makes sense?)' were acknowledged in this study and are discussed in this section (Kemmis, 1980: 121). To begin with, the evidence of this research was based on the perceived outcomes, personal feelings and attitudes of the involved participants and the interpretation of the researcher; hence, the subjectivity of the qualitative study is acknowledged (Denzin and Lincoln, 2005).

Further, limits of interest from research participants for implementing video conferences initially emerged. Therefore there was mainly an initial concern on gathering an adequate number of sub-cases, video conferences between the university and schools. Once partners were found there were also some difficulties in finding a common slot within the university and the schools' timetable to plan a live link which brought to light several issues the chief of which is both the problem and advantage with video conferencing: its synchronous nature. It appeared that a schools' life is predictably busy including school excursions, holidays, inspections, events which were some of the reasons that precluded arranging live links with the university. On the other

hand, the nature of the PGCE course was predominantly practice-oriented and its schedule tightly structured, meaning that trainees spent most of the part of the course at dispersed schools. This is necessary because they need to explore the cultural dimensions of school life including its values, norms, routines, ideologies and complexities of teaching within teachers' CoP at schools (Sim, 2006; Barab et al., 2002). However, allocating time for video conferencing links seemed to rely largely on the teacher education providers and the extent to which they support, sustain and integrate such practices in the course. This depends on how much they are convinced of their pedagogical value towards expanding opportunities to explore cultural dimensions of the teaching profession through new, emerging learning environments supported by synchronous technologies.

However, for practical reasons this study proposes the construction of a site modelled on services such as JANET Collaborate service or Global Leap, or a part of these services that would register a number of various schools and initial teacher providers or continued professional development providers dedicated to planning 'live' links via video conferencing for teacher professional development. Such an action could facilitate and support the processes of finding partners and reduce to a minimum any potential difficulties in allocating a common convenient slot between a single initial teacher provider and a partner school for planning a 'live' link. It could also serve in initiating and developing partnership relationships between universities and a number of different schools.

Further, since training school status is assigned to the schools that assist in developing and disseminating good practice and in contributing to research in teacher education (DfES, 2006), then schools that provide such opportunities via video conferencing technologies may acquire equivalent a qualification as an incentive, and as reimbursement of their time and effort dedicated to sharing practices and expertise. In this way, professional development, knowledge and discussion opportunities could be expanded via video conferencing across the UK. It could also turn to international teams and distributed communities to expand the radius of proximity across cultural and national boundaries. Learning from each other and with each other could be encouraged among trainees, university tutors and experienced teachers from different parts of the country or of the world.

Since there is a need to ensure motivation from both participating institutions, university and schools, to accrue mutual beneficial outcomes for each involved participant it is acknowledged that this study could have considered making the voices of the pupils at the involved schools be heard. However the focus of the research was mainly on developing trainees' professional identity within CoPs. Therefore, only the teachers' perspectives were gathered on how their pupils benefited from the video conference experiences with the university. In fact, a number of pedagogical and social benefits were reported for pupils; however, the perspectives of all participants are likely to be useful and could be gathered in future initiatives.

It was also the fact that the integration of video conferencing as a tool into the Primary PGCE programme was not initiated from the 'inside' by teacher education providers which may have affected the perceived value of video conference. Rather it was introduced from the 'outside' by an independent researcher, although it was mainly supported and endorsed by the university tutors. That said, an action research methodology was not employed because the action and reflexivity for evaluating the use of video conference in the practices of their own professional development scheme had been undertaken by the research participants (university tutors, trainees) rather by an 'insider action researcher' (Frost, 1995: 308). In other words, 'in action research, the investigator becomes part of the field' whereas in this case the investigator stepped back to allow university tutors and trainees to take ownership of the use of the video conferencing technology as they thought it suited best to their needs, learning endeavours and processes (Bryman and Teevan, 2005: 382).

Highlighted here is Pratt's (2008) opinion that video conferences could be seen as a valuable approach for teachers' professional development. They can bridge together different aspects of the knowledge landscape, schools and university, and provide an alternative means for reflection, action and further reflection. Hence, they are meant to be tied into the course's aims and seek in bringing out change to the traditional practices on PGCE courses. Reflective practice, critical thinking and the development of autonomous teaching identities had been some of the aims of this specific PGCE course. Hence video conferences appeared to have made a contribution towards supporting

the course's aims. In contrast to Waters-Adams et al.'s (2009) research that found dissimilar results on the use of video conferencing on another PGCE course in the UK, this was because in Water-Adams et al.'s study trainees were hesitant to engage in peer discourses, which led to consideration of the circumstances conducive to reflective dialogue via the technologies.

In response to that, trainees need to develop the 'art' of questioning and their communication skills to become critical thinkers and enquirers using 'evidence from practice or evidence derived from related educational theory' into their discourses (Harrison et al., 2005a: 87: Harrison et al., 2005b). This means they should be encouraged to deconstruct their practices, to re-enter and unpick past experience, and to determine not only what happened but foremost why it happened and how it might be done differently. This might result in their construction of theories conducive to new understandings. In fact, these processes of enquiry and reflexivity are part of the PGCE approach and this study revealed that, videoconferencing contributed to/helped to facilitate these processes during TEs. Therefore, reflective and communication skills are cultivated then video conference discussions will predominately promote the 'why' they were doing something in particular way –explanations and insights, more than the 'how' of teaching which is more debriefing information - clarifications (Harrison et al., 2005a: 276: Harrison et al., 2005b).

The absence of university tutors in the video conferencing meetings of trainees during the TEs could be seen as both a drawback and a strength of this study. On the one hand it would have been useful to see how the dynamics of trainees' communities change when a university tutor is present in the meetings. On the other hand, there is limited existing research evidence in the literature entirely on the dynamics of trainees' CoP in online settings although there is some empirical evidence on video-tutoring trainees in the presence of tutors in a distance (Hu et al., 2002: Hung and Tan-Seng, 2004: Pratt, 2008: Sharpe et al., 2003). A combination of peer video conferences with or without the additional support of university tutors would be worth further exploration in order to compare and contrast the results.

An additional challenge of this study was the engagement of a number of trainees with different levels of competencies who might have been experiencing demanding and challenging situations during the course. It was revealed from this study that a few trainees who had been in a quite stressful situation 'stepped back' from the video conferences to avoid being overwhelmed by listening to her peers' successes. In contrast, the majority of trainees admitted that when they were struggling they found themselves needing to hear from a peer an encouraging phrase of the type: '*I've been there, don't worry*'. Although trainees agreed in a group interview that it might depend on the personality of each person, it would be interesting to investigate the role of the video conferencing for the neediest trainees. The following section discusses further areas worthy of future research

6.1.3 Areas for development and future research

The impact of video conferencing is rich with opportunities for further study. A combination of video conferencing technologies along with other Web 2.0 technologies, including wikis and blogs, which can even be accessed by mobile devices or portable computers, for achieving continual communication between university tutors and trainees and especially amongst trainees, might be an area worthy of closer consideration. As Comber (2011) suggests, such technologies as wikis and blogs appear to have the potential to 'become key tools for CPD' (continued professional development) although they are currently 'under-developed'. It seems wise that the introduction of such media start formally during initial teacher training when trainees are still learning the craft.

Media worthy of further research could include social networking tools including *Facebook*, *Twitter* and text messaging which in combination with the video conferencing might have the potential to facilitate the building of a common goal and identity and solving practical matters, including the negotiation of the time and the agenda of the video conferencing. Video conferencing with its synchronous visual and audio communication features is so far the only medium which provides communicative situations close to a face-to-face situation and can add much, in line with new social networking tools. In fact, the potential advancement of the video conferencing technologies with telepresence effects with high-quality, life-size pictures and supported mutual eye gaze and document cameras hold promise as mainstream technologies in

the near future to better support 'social presence' effects and feelings of closeness and warmth between the interlocutors.

There are also a number of suggestions for further research related to the integration of the video conferencing technologies for remote classroom observation. Explicitly, offering a series of video conferences of a particular classroom capturing practices over time might be a good research area. Hatch and Grossman (2009) argued there are some classroom routines, structures and skills cultivated over time in a class which are conducive to learning; hence viewing how those are initially built in order to allow pupils to construct knowledge based on their learning needs could be also valuable in addition to one-off observations lasting a short period of time. A further development for future projects could be to enable the university site to control the camera remotely and allow to the trainees and university tutors to focus anywhere in the classroom they wish, thus increasing the authenticity of the experience gained.

Further research is also warranted on enhancing opportunities for trainees to prepare a lesson or an activity back in the school, to the pupils, via video conferencing. There is potential for teaching remotely located pupils whilst being on-campus or actually being in a classroom and transmitting video and audio back to the university site. In this way, the subsequent discussion and reflection within a university and school community could take place on trainees' practices, rather than on experienced teachers' practices. Also team

teaching between trainees, university tutors and experienced teachers could be encouraged. The use of video conferences in different strands and for different purposes on PGCE courses to support the overlapping elements of the course bringing together the two communities, school and university, would be an interesting case study. There is already some research exploring video conferencing events (Lehman and Richardson, 2007: O'Connor et al., 2007: Plonczak, 2010) for supervision and for diversifying experiences but it is an important area worthy of further research. It is an especially important area if the focus is on promoting new emerging learning environments, the 'adaptation model of use' of the video conference, rather than transferring traditional practices online, the 'substitution model of use' (Lawson and Comber, 2010: 319).

Consistent with Hatch and Grossman (2009: 72), in the long term such attempts could 'simulate the development of new scholarly genres that might enable and encourage the development and exchange of representations of teaching' principally for promoting a culture of analysis and discourse. The value of video conferencing in sustaining peer CoP whilst on placements, at least begs a question about how effective they will find it in retaining peer CoP whilst being newly qualified teachers. Some research especially in U.S.A (Kent, 2007) has employed interactive video conferencing as a response to the increasing needs for changes in teacher education to better prepare future teachers to adapt what they know to diverse settings during their employment. Consistent with Salazar et al. (2010) it is suggested here that such projects to be expanded to

in-service training in combination with other technologies such as blogs, wikis and social online networking tools for developing relationships, intimacy, reflection, dialogue and the building of knowledge within learning communities

Those findings in the present study, which show that trainees benefited by sustaining their peer relationships online throughout the course, builds on Chae and Moore's (2007) research. Specifically, their research suggests that very few beginning teachers opt to participate in online professional communities to enhance their own professional development in using online teaching resources and prefer to rely on their local and personal contacts (Moore and Chae, 2007). This research shows that when these local contacts are transferred online then trainees naturally participate in online professional communities. Rather than expecting trainees or beginning teachers to use the technologies for joining online professional CoP, it may be preferable to use the technologies to transfer already existing local communities online at times when face-to-face discourse is impossible, for example when teaching in different schools or when stressful and busy schedules do not allow face-to-face meetings.

6.2 In conclusion

In the long term, the main outcome of this research project is that it challenges many existing views as to best practice in the training of teachers, by encouraging and developing the use of technologies to aid reflective practice.

The mistaken perception that teaching is a private act limited to the teacher and pupils, is one that is, nevertheless, challenged within professional peer communities. In accepting Hatch and Grossman's (2009: 73) point of view that 'teacher learning is a long-term engagement in which both conceptions of practice and repertoires of practice develop over time' it may be important for teachers to act as reflexive collaborative peers, starting from the very beginning of their training. The DfE (2010b: 22) has published recently 'the initial training of teachers is perhaps the most important part of their professional development'. One of the goals of the new policy is to make formal teachers' observation in other words drop-ins by colleagues and consultants in a teacher's classroom accepted practices on a daily basis in order that 'observing teaching and being observed', plan, reflect, prepare and teach with other teachers will be from now on the norm (DfE, 2010b: 19).

Video conferencing technologies has proved in this PGCE course as a key mean for supporting the personal, social and pedagogical needs of the trainees in the company of their peers, their university community in order to gradually enter the school community. Since the focus of the training courses in teacher education has been for the last twenty years 'sharply on teaching practice' and the DfE (2010b: 22) has now announced that 'the proportion of time in schools for [trainees'] training' has been even more increased, then video conferencing technologies used to sustain peer university communities whilst on dispersed TEs can have a positive effect for developing trainees' collaborative reflective practices. To end with, video conferencing links between the university and the

schools for transmitting authentic classroom practice upon which a number of trainees, university tutors, pupils and experienced teacher to discuss and reflect can be exemplar cases of powerful educational partnerships in the service of the transformation in schools.

Appendices

Appendix A: Case study: Integrating video conferencing in a Primary PGCE course

'Sub-cases' – Video Conferencing Links			
Multi-point Video Conferences on TEs		Remote Classroom Observation	
Pilot Phase (PGCE Cohort 2007/8)			
02/11/07 09/11/07 15/11/07	Teaching Experience 1 Meeting Platform: Adobe Connect		
Actual Study (PGCE Cohort 2008/9)			
31/10/08 05/11/08 12/11/08	Teaching Experience 1 Meeting Platform: Adobe Connect	29-30-02/09/08 – Testing 09/10/08 – Observing a <i>Literacy Lesson</i>	Local School
29/01/09 05/02/09 05/02/09 11/02/09 25/02/09 05/02/09 11/03/09 12/03/09	Teaching Experience 2 Meeting Platform: Intercall	12/11/08 – Testing 26/11/08 – Observing a <i>Literacy Lesson</i>	Distant School
27/05/09 28/05/09 04/06/09 11/06/09	Teaching Experience 3 Meeting Platform: Intercall	19/03/09 – Testing & Introduction Session 30/03/09 – Observing a <i>Science Lesson</i>	Distant School

Appendix B: Indicative questions posed during the group interview with trainees after TE1

*Those were used as a canvass to build the discussion rather than asked as closed questions

Group interviews – Trainees

Questions:

Section A. Eliciting evidence of CoPs within the PGCE course

1. Describe your relationship with your peers
 - a. How do you feel when you are posted in different schools?
 - b. How do you communicate with peers and tutors whilst on TE?
2. When you face a challenge or you achieve a goal at schools who do you contact first, how do you contact them and why?
 - a. Who would you personally LIKE to contact, how and why?
3. What do you like about TEs?
 - a. Is there anything that you would like to change about TEs?
4. What do you think of integrating video conferencing meetings in your course?

Section B. Eliciting any evidence to indicate sustaining a distributed CoP

5. Have you ever had a meeting via video conferencing before?
6. Why did you meet each other online?
 - a. Did have a purpose? Who set the purpose?
7. Any difficulties when operating the meeting area?
 - a. How many meetings did you need to feel comfortable enough with the technologies?
8. What did you discuss during the meetings? Why?
9. How did you feel talking to each other? Why?
10. What were your expectations from each other?
11. What did you think of the group size participated in your meetings?
12. What was the role of the (involved) tutor in your opinion?

Section C. Evaluating video conferencing experience for their career and in their learning

13. As future teachers, how would you value your experience in video conferencing meetings?
 - a. Can you see any potential applications of the video conferencing in schools?
14. How would you imagine the integration of video conferencing in your course now that you have experienced it and got familiar with it?
15. Would you join future meetings during TE2 & 3?
16. What would you change in future meetings?
17. What would you keep the same in future meetings?
18. How would you describe your experienced to your peers that did not have such experience?
19. Would you like to add anything as a final comment?

Thank you!

Appendix C: Indicative questions posed during the group interview with trainees after TE2

*Those were used as a canvass to build the discussion rather than asked as closed questions

Group interviews – Trainees

Questions:

Section A. Eliciting evidence of CoPs within PGCE course

1. Do you think that TE2 was any different to TE1?
2. What was it like working along with experienced teachers?
 - a. To what extent did they provided you opportunities to engage and contribute in the practices of experienced teachers? (legitimacy)
 - b. To what extent did you feel capable – you were confident enough– to engage and contribute in the practices of experienced teachers? (peripherality)
3. How would you define your identity: Do you consider yourselves as students or teachers or...? Why?
 - a. How did you feel at the beginning of the course and during TE1 regarding your identity (students or teachers)?
 - b. Where do you think that you will be in terms of belonging and identity by the end of the course?
 - c. Do you think that the two identities conflict with each other or that they rather support and enhance each other? (meeting the demands of being a teacher versus meeting the demands of the university)
 - d. Where and how the two identities overlap?
4. Describe your relationship with your peers
 - a. How do you feel when discussing your pedagogical practices/ experiences with your peers?
5. What do you learn at the university that you cannot learn on TEs and vice versa in your opinion?
6. Is there anything that you would like to change about TEs?

Section B. Eliciting any evidence to indicate sustaining a distributed community of practice and supporting learning transition

7. What do you think of the idea of integrating online meeting via VC during your TEs?
8. Why did you meet each other online? Did you have any benefits?
 - a. What did you discuss during the meetings?
 - b. What did your discussions look like? (Professional discourse or social chat or a mixture of both?)
 - c. Have you been using knowledge gained at the university to explain or describe your TEs?
 - d. Did you feel intimidated or comfortable talking to each other? Why?
9. Did you find it difficult, at times or during the whole TE2, to attend the online meetings? What were the obstacles?
10. Was it difficult to operate the meeting area?
 - a. Have you ever had a meeting via VC before?
 - b. How many meetings did you need to feel comfortable enough?

Section C. Evaluating VC experience

11. Do you think that the experiences you gained when participating in online meetings has any value for your future professional career?
12. Would you like to join online meeting during TE3?
 - a. What would you change in future meetings?
 - b. What would you suggest for the improvement of the meetings to better cover your needs?
 - c. What would you keep the same in future meetings?
13. How would you describe your experienced to your peers that did not have such experience?
14. Would you like to add anything as a final comment?

Thank you!

Appendix D: Indicative questions posed during the group interview with trainees after TE3

*Those were used as a canvass to build the discussion rather than asked as closed questions

Group interviews – Trainees

Questions:

Section A. Eliciting evidence of CoPs' concepts within the PGCE course

1. You are almost at the end of the course, how do you feel?
 - a. How was your final TE?
2. I would like you to reflect back and discuss where have you been and where are you now?
 - a. How would you define your identity now and then?
3. What are your reflections on the course?
 - a. What would you change?
 - b. What would you leave the same?
 - c. What was the most important aspect of the course that helped you to become teachers?
4. Which technological tools did you found useful during the course and why? Facebook? Msn? VC? Wikis? Blackboard?
 - a. Can you make any comparisons?
5. What was it like working with peers, university tutors, and experienced teachers?
 - a. Did they play any role in facilitating you to become teachers?
 - b. Any thoughts about the future? Are you going to keep in touch with your peers? How would you do that?

Section B. Reflections on the online meetings

6. Reflecting back on the online meetings: Is video conferencing a useful tool or it didn't make any difference for you to meet your goals?
7. When it was most useful for you and why?(e.g. during TE2 or 3)
8. What didn't you like at all? What were the drawbacks?

9. What would you change? In other words, what would you suggest for improving online meetings for next year's trainees?
10. Do you think that the experiences you gained when participating in online meetings has any value for your future professional career?
11. Would you like to add anything as a final comment

Thank you!

Appendix E: Indicative questions posed during the group interview with trainees after VC3

Group interviews – PGCE students

Questions:

Section A. Previous experiences – Evaluating the sessions and the potential VC in the PGCE course

1. Have you ever participated in VCs before?
2. Why did you join the session last Monday?
 - a. Did the session meet any of your expectations?
 - b. What were the outcomes of the session for the participants? (you as a trainee, tutor, experienced teachers, children)
 - c. What did you think of the interaction slot between the two sides?
 - d. How would you evaluate the session's format (did you have enough information beforehand, did the initial communication with the teacher provided you the information you needed, the duration of the observation, the feedback provide at the end by the tutor)?
3. What would you change in future meetings?
4. In relation to the aims of your PGCE course how would you evaluate the VCI? Where it can be used and why?
5. Specifically considering your needs as a science specialist group how would you value sessions like this one to be integrated into your learning?

Section B. Eliciting evidence of communities of practice within PGCE course

6. In the current stage how would you define yourselves, your identity?
7. What do think of VCs between the university and schools? Do you think that they play any role on the process of becoming teachers? Please describe.
8. Describe your relationships with your peers.
9. Please give any further comments: What did you like best or less from the session?

Appendix F: Indicative questions posed during interviews with a university tutor after VC3

One-to-one Interview: University Tutor

Questions:

Section A. Previous experiences – Evaluating the sessions and the potential VC in the PGCE course

1. Could you please describe briefly your previous experiences with VC?
2. What were the reasons prodding you to promote VC as a tool in the Primary PGCE course?
 - a. Did the session meet any of your expectations?
 - b. What were the outcomes of the session for the participants? (you as a tutor, trainees, experienced teachers, children)
 - c. What did you think of the interaction slot between the two sides?
 - d. How would you evaluate the session's organisation?
 - e. What was the value of the initial VC among teacher, university tutors?
3. What would you change in future meetings?
4. In relation to the aims of the PGCE course how would you evaluate the VC as a tool? How it can be used and why?
5. How would you evaluate this VC integrated in their course as regards to the needs of the trainees in the science specialist group?

Section B. Eliciting evidence of communities of practice within PGCE course

6. In the current stage how would you define the identity of your trainees?
 - a. Do they engage in professional discourses or student discussions?
7. What do think of VCs between the university and schools? Do they have any effect in any ways on PGCE students' training (in becoming teachers)? If yes, how and why?
8. How would you define your role in this process?
 - a. How do you assist trainees become teachers?
9. Any other comments? What did you like or dislike about the session?

Appendix G: Indicative questions posed during the interview with the experienced teacher and the ICT Consultant from LEA after VC3

*This group interview took place via video conferencing

Interview: Experienced teacher and ICT Consultant from LEA

1. First of all, would you like to share your reflections (thoughts, feelings) on our last VC? What do you think went well? What do you think it didn't go particularly well?
2. What did you expect from the VC and what was the outcome?
3. Would you schedule more similar VCs with initial teacher providers?
4. What future plans do you have, if any?
5. Would you see any potential benefits or negative effect for your side from such VC exchanges?
6. What did the children express themselves about the VC? Did they feel as another routine lesson or not?
7. What did you (as a teacher) think about the VC?
8. What does it take to organise a VC like the one we had? (beforehand planning, organisation of the classroom)
 - a. Does it interrupt in any ways the learning of the children?
9. Any other comments, suggestions, thoughts

Appendix H: Formal Letter for seeking parents' consent

[date]

TO: Parents of Year [...] pupils [school]

SUBJECT: Children's participation in a research project

Dear Parent/Carer,

My name [...]

The Year [...] class has been invited to take part in a research project that is undertaken by [University Name/Department] thus the participation of your child is kindly requested. The focus of the research is the interaction between the children, their teacher, the trainee teachers and university tutors during a literacy lesson.

A Video Conferencing link will be set up between [school and university's names] and this will allow the teacher trainees at the university to watch a literacy lesson being taught and to ask children questions about their learning. The children and their teacher will also be encouraged to ask questions back.

The lesson is due to take place on [day/date] and it will last for approximately an hour. The activity will be video recorded and analysed only for the purposes of this research. Your child's participation in the above project will be greatly appreciated since it will help me evaluate the success of the project. Please sign the consent slip below and return it to the teacher by [date]

Yours sincerely,

Maria Hadjipavlou

Contact details: [...]

Please contact the researcher or your child's teacher with any further questions you may have

.....
I give/ don't give permission for my child.....(Child's name) to participate in the project run by [University's name] on [date]

Sing.....

Date.....

Appendix I: Screen shots of the Nvivo program showing theoretical categorisation of the data into tree and child nodes

PhD- Video conferences on placement and for remote classroom observation - NVivo

File Edit View Go Project Links Code Tools Window Help

New [Icons]

Code At [Icons]

Look for: Search In Tree Nodes Find Now Clear Options

Nodes

- Free Nodes
- Tree Nodes
- Cases
- Relationships
- Matrices
- Search Folders
- All Nodes

Sources

Nodes

Sets

Queries

Models

Links

Classifications

Folders

Tree Nodes

Name	Sources	References	Created	Modified
Moving into the Community of teachers	0	0	6/12/2009 9:56 PM	6/13/2009 8:55 PM
Comparing TE1 to TE2	9	19	6/11/2009 8:21 PM	6/22/2009 4:30 PM
Comparing TE2 to TE3	5	11	6/14/2009 11:59 AM	7/23/2009 1:46 PM
Legitimate Peripheral participation	0	0	6/11/2009 9:14 PM	6/13/2009 8:55 PM
Regimes of competence	0	0	6/11/2009 9:00 PM	6/13/2009 8:55 PM
Shared repertoire of practice	12	27	6/14/2009 5:08 PM	7/20/2009 3:49 PM
Student teachers experience their Identity	0	0	6/11/2009 8:53 PM	7/1/2009 10:34 PM
Identity as a nexus of multimembership	2	3	6/11/2009 9:55 PM	6/13/2009 8:55 PM
Identity as learning trajectory 'you kind of go from b	12	17	6/11/2009 7:01 PM	7/23/2009 11:48 AM
Identity as negotiated experience of self	2	3	6/11/2009 9:50 PM	7/19/2009 2:01 AM
University learning community	0	0	6/11/2009 10:52 PM	6/19/2009 8:44 PM
Describing peer relationships	0	0	6/12/2009 9:31 PM	6/19/2009 8:44 PM
Diversity	14	22	6/12/2009 3:57 PM	9/4/2009 2:38 PM
Homogeneity	6	7	6/12/2009 12:43 AM	9/4/2009 2:38 PM
Shared repertoire of practice (tasks, sessions, requ	2	2	6/11/2009 10:57 PM	7/19/2009 5:01 PM
Video conferences for remote classroom observati	0	0	6/21/2009 10:21 PM	6/21/2009 10:21 PM
Comparing VC1 to VC2 and VC3	4	7	6/22/2009 4:49 PM	6/22/2009 11:31 PM
outcomes	0	0	6/21/2009 10:20 PM	6/22/2009 3:27 AM
previous experiences with VC	8	11	6/21/2009 10:26 PM	7/23/2009 1:44 PM
suggestions - process	0	0	6/21/2009 10:25 PM	6/22/2009 9:10 PM
VC versus other technologies and physical presen	6	23	6/22/2009 2:06 AM	6/23/2009 12:07 AM
Video conferences on placements	0	0	6/12/2009 2:26 AM	6/19/2009 9:04 PM
Discourse themes	0	0	6/13/2009 1:16 AM	6/13/2009 8:55 PM
Drawbacks	0	0	6/12/2009 3:08 PM	6/13/2009 8:55 PM

182 Items

PhD- Video conferences on placement and for remote classroom observation - NVivo

File Edit View Go Project Links Code Tools Window Help

New [Icons]

Code At [Icons]

Nodes

- Free Nodes
- Tree Nodes
- Cases
- Relationships
- Matrices
- Search Folders
- All Nodes

Sources

Nodes

Sets

Queries

Models

Links

Classifications

Folders

Look for: [Dropdown] Search In [Tree Nodes] Find Now Clear Options

Tree Nodes

Name	Sources	References	Created	Modified
Moving into the Community of teachers	0	0	6/12/2009 9:56 PM	6/13/2009 8:55 PM
Comparing TE1 to TE2	9	19	6/11/2009 8:21 PM	6/22/2009 4:30 PM
Comparing TE2 to TE3	5	11	6/14/2009 11:59 AM	7/23/2009 1:46 PM
Legitimate Peripheral participation	0	0	6/11/2009 9:14 PM	6/13/2009 8:55 PM
Legitimacy	12	23	6/11/2009 10:44 PM	7/19/2009 5:25 PM
Mentor-mentee relationship	14	28	6/12/2009 3:10 PM	9/4/2009 2:38 PM
Non participation	3	5	6/11/2009 8:21 PM	6/14/2009 1:44 PM
Partiality	5	9	6/12/2009 1:31 AM	6/15/2009 5:45 PM
Participation	14	28	6/11/2009 10:44 PM	7/23/2009 11:47 AM
Peripherality	14	35	6/11/2009 10:45 PM	7/23/2009 11:47 AM
Regimes of competence	0	0	6/11/2009 9:00 PM	6/13/2009 8:55 PM
Accountability to the enterprise	10	27	6/11/2009 8:59 PM	7/20/2009 3:49 PM
an indigenous enterprise	11	15	6/12/2009 12:39 AM	7/23/2009 10:30 AM
Mutuality of engagement	6	8	6/11/2009 9:04 PM	7/23/2009 11:25 AM
Negotiability of the repertoire	6	10	6/11/2009 9:06 PM	7/19/2009 4:58 PM
Shared repertoire of practice	12	27	6/14/2009 5:08 PM	7/20/2009 3:49 PM
Student teachers experience their Identity	0	0	6/11/2009 8:53 PM	7/1/2009 10:34 PM
Identity as a nexus of multimembership	2	3	6/11/2009 9:55 PM	6/13/2009 8:55 PM
Feeling- Thinking- Talking like Student	18	54	6/11/2009 10:53 PM	7/23/2009 11:46 AM
Feeling- Thinking- Talking like Teacher	16	88	6/11/2009 10:53 PM	7/23/2009 11:49 AM
Identity of reconciliation	4	7	6/11/2009 9:56 PM	7/20/2009 1:24 AM
Building connections between theory	17	34	6/12/2009 1:41 AM	7/21/2009 3:03 PM
Constant struggles	10	28	6/12/2009 5:15 PM	6/22/2009 4:19 PM

182 Items

Appendix J: Video conference form constructed to be shared by all involved participants including all the necessary information for establishing the first 'live' link

Video Conference form

Call Information:	
Time & Date of Call	9 th of October 2008, Thursday 8:55am - 9:55am
Room Booked	
Number of local participants	119 Primary PGCE Students – University tutors
Type of Call	JVCS (JANET Videoconferencing Service) will call both ends at 8.55am to video record the session
Purpose	Remote classroom observation
Type of connection	IP (One to One) Network Connection: IP @ 768K
Audio Visual equipment	Projector
IP Address	Tandberg Unit is E.164/IP Number:
Personal Details:	
Your Name & Department	Maria Hadjipavlou
Your E-mail address & phone number	
Remote Participants: (Please supply as much information as possible).	
Full Name	
Telephone Number	
IP Address	Sony 17 digit E.164/IP Number is : Internal IP address:
Technical contact E-mail address & phone number	

Appendix K: Plain observation sheet constructed for the purposes of the video conferences for remote classroom observation

**Observation Sheet:
Video Conferencing with a Primary
School**

Topic: _____ Grade: _____

Teacher: _____

Optional Space for further
thoughts

Observation Objective(s):

Observation focus 1:

Observation focus 2:

Observation focus 3:

Observation focus 4:

Lesson Information:

Lesson Information:

Lesson Information:

Lesson Information

Possible questions:

Possible questions:

Possible questions:

Possible questions:

Appendix L: A completed observation sheet by a trainee observing VC1

The trainees wrote: 'Video conferencing is a very good tool when it works',
 'Good to ask the children on what they themselves think of the lesson',
 'Very useful to show us how lessons can be conducted',
 'We can then gain ideas about learning strategies'.

Observation Sheet: Video Conferencing with Primary		Lesson: Literacy	Year: 4
Lesson Objective(s): Teaching poetry		Teacher:	
Observation Objective(s): To observe how a teacher communicates a learning objective to children and teaches it during the introduction.		Optional Space for further thoughts - video conferencing is a very good tool when it works. - good to ask the children on what they themselves think of the lesson. - v. useful to show us how lessons can be conducted - we can then gain ideas about learning strategies.	
Observation focus 1: What is the learning objective for the introduction?	Observation focus 2: How does the teacher communicate the objective to all the children?	Observation focus 3: How does the teacher teach the objective?	Observation focus 4: How does the introduction relate to the main part of the session?
Lesson Information: - to get the children thinking about different ways to describe objects - so they can then eventually learn how to use this in a poem.	Lesson Information: - uses everyday items to describe - asks questions to the class - ask the children to describe a fruit & then share it to the class.	Lesson Information: - uses props - gets children to discuss with each other in pairs - asks children to come up to the front and interact with the lesson. - she is very enthusiastic - getting the children interested - introduces terminology	Lesson Information: - gets the children to think about describing objects using sounds and adjectives - so they can then go and write their own describing words and eventually a poem.
Possible questions: 	Possible questions: 	Possible questions: 	Possible questions:
Main question that I would like to ask the teacher at the end of the lesson: 			

Appendix M: Video conference form constructed to be shared by all involved participants including all the necessary information for establishing the second 'live' link

Video Conference form

Testing Details: Date & Time	12 th November 2008 (Wednesday) 2:00 p.m. ✓
--	--

Actual Video conferencing: Time & Date of Call	26 th of November 2008, Wednesday 9:15 am - 9:55am
Type of Call	JVCS (JANET Videoconferencing Service) will call both ends at 9:00am to video record the session (Janet Service's phone number:)
Purpose	Remote classroom observation & Interaction
Video conferencing scheme	9.00 – Link between the two sites – 15' testing 9.15 - Introductions and discussion about learning objective 9.20 - Phonics work on the carpet begins 9.35 - Group work 9.45 - Discussion between teacher and trainees 9.55 - end of video conference

University's Participants:	
Participants	<ul style="list-style-type: none"> • University tutor • 119 Primary PGCE Students
Room Booked at the University	
Audio Visual equipment	Projector
IP Address at the University	E.164/IP Number: Tandberg Unit is
Remote Participants: (Please supply as much information as possible).	
School's Name	
Local Authority	
Teacher's name	

Class	Foundation Stage (Reception)
IP Address at the school	E.164/IP Number is : IP address is:
Contact E-mail address & phone number	

Appendix N: Observation sheet assigned for VC2 for remote classroom observation

Observation Sheet: Video Conferencing with a Primary School

Topic: Literacy (Teaching Phonics)
Teacher:
School:

Grade: Foundation Stage
(Reception)

Video Conference Scheme

9.15 - Introductions and discussion about learning objective
9.20 - Observing Phonic work on the carpet
9.35 - Observing group work at the school
9.45 - Discussion between you, your tutor, teacher and students

What is the learning objective?

Optional Space for further thoughts

Observation focus 1:

Observation focus 2:

Observation focus 3:

Observation focus 4:

What phonics phase/stage are the children at?

How does the teacher get the children to articulate the phonemes?

How are children encouraged to blend and segment phonemes?

In what way is the teaching multisensory?

Lesson Information:

Lesson Information:

Lesson Information:

Lesson Information:

References

- ARNOLD, T., CAYLEY, S. and GRIFFITH, M. (2004) *Video Conferencing in the Classroom: Communications Technology across the Curriculum*, UK: Devon Curriculum Services, DfES.
- BAEK, E.-O. and BARAB, S. A. (2005) A Study of Dynamic Design Dualities in a Web-Supported Community of Practice for Teachers. *Educational Technology & Society*, **8**(4), 161-177.
- BANKS, BARLEX, JARVINEN, O'SULLIVAN, JACKSON, O. and RUTLAND (2004) DEPTH - developing professional thinking for technology teachers: an international study. *International Journal of Technology and Design Education*, **14**(2), 141-157.
- BARAB, S. A., BARNETT, M. and SQUIRE, K. (2002) Developing an Empirical Account of a Community of Practice: Characterizing the Essential Tensions. *Journal of the Learning Sciences*, **11**(4), 489-542
- BARAB, S. A. and DUFFY, T. M. (2000) From Practice Fields to Communities of Practice. IN JONASSEN, D. H. and LAND, S. M. (Eds.) *Theoretical Foundations of Learning Environments*. Mahwah, New Jersey Lawrence Erlbaum Associates
- BARAB, S. A., MAKINSTER, J. and SCHECKLER, R. (2003) Designing system dualities: Characterizing a web-supported teacher professional development community. *Information Society* **19**(3), 237-256.
- BARAB, S. A., MAKINSTER, J. G., MOORE, J. A. and CUNNINGHAM, D. J. (2001) Designing and Building an On-line Community: The Struggle to Support Sociability in the Inquiry Learning Forum. *Educational Technology Research and Development* **49**(4), 71-96.
- BARBOUR, R. S. (2001) Checklists for improving rigour in qualitative research: a case of the tail wagging the dog? *British Medical Journal*, **322**(7294), 1115-1117.
- BASIT, T. N. (2003) Manual or electronic? The role of coding in qualitative data analysis. *Educational Research*, **45**(2), 143-154.
- BASSEY, M. (1999) *Case study research in educational settings*, UK: Open University Press, McGraw-Hill Education.
- BECK, C. and KOSNIK, C. (2001) From cohort to community in a preservice teacher education program. *Teaching and Teacher Education*, **17**(8), 925-948.
- BECK, R. J., KING, A. and MARSHALL, S. K. (2002) Effects of Videocase Construction on Preservice Teachers' Observations of Teaching. *The journal of Experimental Education*, **70**(4), 345-361.
- BECTA (BRITISH EDUCATIONAL COMMUNICATIONS AND TECHNOLOGY AGENCY) (2003) What the research says about video conferencing in teaching and learning. *From the Becta's What the Research Says series*.
- BEEKHUYZEN, J. (2008) Conducting a literature review : a puzzling task. IN JEFFREY, P. L. (Ed.) *AARE (Australian Association for Research in Education)*. Brisbane.
- BELL, J. (2005) *Doing your Research Project. A Guide for First Time Researchers in Education and Social Science*, UK: Open University Press.
- BERA (BRITISH EDUCATIONAL RESEARCH ASSOCIATION) (2003) *Issues and Principles in Educational Research for Teachers*, British Educational Research Association.
- BEYERBACH, B., WALSH, C. and VANNATTA, R. (2001) From Teaching Technology to Using Technology to Enhance Student Learning: Preservice Teachers' Changing Perceptions of Technology Infusion. *Journal of Technology and Teacher Education*, **9**(1), 105-127. Norfolk, VA: AACE.
- BOCCIA, J. A., FONTAINE, P. L. and LUCAS, M. F. (2002) Looking into Classroom: A Technology Mediated Observation Program for Preservice Teachers. IN ESPINOZA, S. (Ed.)

- Telecommunications: Preservice, Inservice, Graduate, and Faculty, SITE 2002, Proceedings of Society for Information Technology and Teacher Education International Conference*. Nashville, Tennessee, Association for the Advancement of Computing in Education.
- BOOTE, D. and BEILE, P. (2005) Scholars Before Researchers: On the Centrality of the Dissertation Literature Review in Research Preparation. *Educational Researcher*, **34**(6), 3-15.
- BRITISH EDUCATIONAL COMMUNICATIONS AND TECHNOLOGY AGENCY (BECTA) (2003) What the research says about video conferencing in teaching and learning. *From the Becta's What the Research Says series*.
- BRITISH SOCIOLOGICAL ASSOCIATION (2004) Statement of Ethical Practice for the British Sociological Association.
- BROWN, J. S. (2002) Growing Up Digital: How the Web Changes Work, Education, and the Ways People Learn. *United States Distance Learning Association (USDLA Journal)*, **16**(2), Available: http://www.usdla.org/html/journal/FEB02_Issue/article01.html.
- BROWN, J. S., COLLINS, A. and DUGUID, P. (1989) Situated Learning and the Culture of Learning. *Education Researcher*, **18**(1), 32-42.
- BRYDE, B. R. (2001) Online Tutoring: Networking Preservice Teachers and K-12 Students. California Lutheran University.
- BRYMAN, A. and TEEVAN, J. J. (2005) *Social Research Methods, Canadian Edition*, Canada: Oxford University Press.
- BUYSSE, V., SPARKMAN, K. L. and WESLEY, P. W. (2003) Communities of Practice: Connecting What We Know with What We Do. *Exceptional Children*, **69**(3), 263-77.
- CAIPINGI, X., WENTING, L. and WEIWEI, Y. (2010) The application of network video conference system in network of teaching and research - Take delight IP 5.0 remote interactive teaching platform for example. *International Conference on Networking and Digital Society*, **1**, 538-541.
- CHAPMAN, C., RAMONDT, L. and SMILEY-GLENN (2005) Strong community, deep learning: exploring the link. *Innovations in Education and Teaching International*, **42**(3), 217-230.
- CHARNITSKI, C. W. and HARVEY, F. A. (2000) Learning Science Concepts at a Distance in Preservice Teacher Education: Results of a Pilot Study. *National Convention of the Association for Educational Communications and Technology*. Denver, Colorado.
- CHEN and WILLITS (1998) A Path Analysis of the Concepts in Moore's Theory of Transactional Distance in a Videoconferencing Learning Environment. *Journal of Distance Education*, **13**(2), 51-65.
- CHRISTENSEN, L., TINDOL, D., LAN, J., NELSON, B., ANDERSON, J., KELLY, C., CLEMONS, T. and CHAMBERS, L. (2002) Tour, Think, and Tell: A Video Conference Virtual Field Trip. IN ESPINOZA, S. (Ed.) *Telecommunications: Preservice, Inservice, Graduate, and Faculty, SITE 2002, Proceedings of Society for Information Technology and Teacher Education International Conference*. Nashville, Tennessee, Association for the Advancement of Computing in Education.
- COCHRAN-SMITH, M. and LYTLE, S.-L. (1998) Teacher Research: The Question That Persists. *International Journal of Leadership in Education*, **1**(1), 19-36.
- COCHRAN-SMITH, M. and LYTLE, S. L. (1992) Communities for teacher research: Fringe or forefront? *American Journal of Education*, **100**(3), 298-324.
- COCHRAN-SMITH, M. and LYTLE, S. L. (1999) The Teacher Research Movement: A Decade Later. *Educational Researcher*, **28**(7), 15-25.
- COCHRAN, S. M. and LYTLE, S. L. (1998) Teacher Research: The Question That Persists. *International Journal of Leadership in Education*, **1**(1), 19-36.

- COHEN, L., MANION, L. and MORRISON, K. (2000) *Research Methods in Education*, London: RoutledgeFalmer.
- COMBER, C. (2011) ICT-mediated Continuing Professional Development, A Review of the Literature, 2004-Present. *ICT for CPD: Report for Becta: March 2010*. Coventry: Becta.
- COMBER, C., LAWSON, T., GAGE, J., CULLUM-HANSHAW, A. and ALLEN, T. (2004) Video Conferencing in the Classroom Project. IN REPORT FOR SCHOOLS OF THE DFES (Ed.) UK, University of Leicester, University of Cambridge.
- COUGHLIN, E. and KAJDER, S. (2009) The Impact of Online Collaborative Learning on Educators and Classroom Practices. IN LEMKE, C. and LESLEY, B. (Eds.) *Advance 21st century innovation in schools through smart, informed state policy*. Los Angeles, The Metiri Group, Cisco Systems.
- COX, A. (2005) What are communities of practice? A comparative review of four seminal works. *Journal of Information Science*, **31**(6), 527-540.
- COYLE, D. (2004) Redefining Classroom Boundaries: Learning To Teach Using New Technologies. *Canadian Journal of Educational Administration and Policy*, **32**, 1-16.
- COYLE, D., WIESEMES, R. and FISCHER, I. (2006) CDROM Teaching and Learning Observatory (TLO). A unique concept in the development of 'learning communities'. DfES Innovations Unit. University of Nottingham, Promethean, DfES, TLO.
- CRAWFORD, L., SHARPE, L., CHUN, H., GOPINATHAN, S., NGOH, M. S. and WONG, A. (2002) Multipoint Desktop Video Conferencing in Teacher Education: preliminaries, problems and progress. *Asia-Pacific Journal of Teacher Education*, **30**(1), 67-78.
- CRESWELL, J. W. (2005) *Educational Research: Planning Conducting and Evaluating Qualitative and Quantitative Research*, USA: Pearson Education.
- CROOK, C. and HARRISON, C. (2008) Web 2.0 Technologies for Learning at Key Stages 3 and 4: Summary Report. *BECTA: British Educational Communications and Technology Agency*.
- CULLIMORE, D. (1999) An Evaluation Of The Use Of New Technologies To Support Mentorship In Teacher Training. *Paper presented at the British Educational Research Association Conference*. University of Sussex, Brighton, Education-line internet document collection.
- DENSCOMBE, M. (1998) *The Good Research Guide*, Buckingham-Philadelphia: Open University Press.
- DENZIN, N. K. and LINCOLN, Y. S. (2005) Introduction: The Discipline and Practice of Qualitative Research IN DENZIN, N. K. and LINCOLN, Y. S. (Eds.) *The Sage Handbook of Qualitative Research, Third Edition*. Thousand Oaks, California, Sage.
- DEPARTMENT FOR CHILDREN SCHOOLS AND FAMILIES (2007) Equipping our Teachers for the Future: Reforming Initial Teacher Training for the Learning and Skills Sector. IN DFES STANDARD UNIT (Ed.).
- DFE (2010a) The Case for Change. *White Paper*.
- DFE (2010b) The Importance of Teaching. *The Schools White Paper*.
- DFES (2006) Training Schools. *The Standards Site. Raising standards.*, Teachers'tv, Directgov, Teachernet, NGfL, QCA, Ofsted, NCSL.
- DINSMORE, J. and WENGER, K. (2006) Relationships in preservice teacher preparation: from cohorts to communities. *Teacher Education Quarterly*, **33**(1), 57-74.
- DUBÉ, L., BOURHIS, A. and JACOB, R. (2006) Towards a Typology of Virtual Communities of Practice. *Interdisciplinary Journal of Information, Knowledge, and Management*, **1**, 69-73.
- EDMONDSON, R. S. (2005) Evaluating the effectiveness of a telepresence-enabled cognitive apprenticeship model of teacher professional development. Logan, Utah, Utah State University.

- EDMONDSON, R. S. (2007) Investigating the Effectiveness of a Telepresence-Enabled Cognitive Apprenticeship Model of Teacher Professional Development. *PRESENCE 2007: The 10th Annual International Workshop on Presence*. Barcelona, Spain, (ISPR) International Society for Presence Research.
- EDWARDS, A. and PROTHEROE, L. (2003) Learning to See in Classrooms: what are students teachers learning about teaching and learning while learning to teach in schools? *British Educational Research Journal*, **29**(2), 227-242.
- EISENSCHMIDT, E. (2006) Novice teachers as members of professional learning communities. *Paper presented at the European Conference on Educational Research*. University of Geneva, Tallinn University, Estonia.
- ERAUT, M. (2007) Learning from other people in the workplace. *Oxford Review of Education*, **33**(4), 403-422.
- ERTL, B., FISCHER, F. and MANDL, H. (2006) Conceptual and Socio-Cognitive Support for Collaborative Learning in Videoconferencing Environments. *Computers and Education*, **47**(3), 298-315.
- ERTL, B., REISERER, M. and MAND, H. (2005) Fostering collaborative learning in videoconferencing: the influence of content schemes and collaboration scripts on collaboration outcomes and individual learning outcomes. *Education, Communication and Information*, **5**(2), 147-166.
- ESRC (ECONOMIC AND SOCIAL RESEARCH COUNCIL) (2005) Research Ethics Framework (REF).
- EVANS, L. (2002) What is teacher development? *Oxford Review of Education*, **28**(1), 123-137.
- EVANS, M. A. and POWELL, A. (2007) Conceptual and practical issues related to the design for and sustainability of communities of practice: the case of e-portfolio use in preservice teacher training *Technology, Pedagogy and Education*, **16**(2) 199-214.
- FISHER, R., HARREVELD, R. E. and MCDUGALL, J. K. (2007) Conceptualising communities of practice through embedded professional learning in pre-service teacher education IN KNIGHT, B. A., WALKER-GIBBS, B. and DELAMOR, J. (Eds.) *Research into 21st century communities*. Teneriffe, Qld : Post Pressed.
- FISHER, T. (2004) New Technologies and Teachers' Work. *Canadian Journal of Educational Administration and Policy (CJEAP)*, (32), July 1.
- FISHER, T., HIGGINS, C. and LOVELESS, A. (2006) Report 14: Teachers Learning with Digital Technologies: A review of research and projects. IN FUTURELAB SERIES (Ed.) *futurelab*. UK, University of Nottingham, Oxford Brookes University, University of Brighton.
- FLICK, U. (2007) *Designing Qualitative Research: The SAGE Qualitative Research Kit*, London: Sage.
- FROST, D. (1995) Integrating Systematic Enquiry into Everyday Professional Practice: towards some principles of procedure. *British Educational Research Journal*, **21**(3), 307-321.
- GAO, P. (2010) Enhance preservice teacher learning in the cohort structured blended learning environments. *2nd International Conference Education Technology and Computer (ICETC)*. Shanghai.
- GIBBS, G. (2007) *Analyzing Qualitative Data, The Sage Qualitative Research Kit*, London: Sage Publications.
- GÓMEZ, P. and RICO, L. (2007) Learning Within Communities of Practice in Preservice Secondary School Teachers Education. *PNA*, **2**(1), 17-28.
- GUBA, E. G. and LINCOLN, Y. S. (2005) Paradigmatic Controversies, Contradictions, and Emerging Confluences. IN DENZIN, N. K. and LINCOLN, Y. S. (Eds.) *The Sage Handbook of Qualitative Research, Third Edition*. Thousand Oaks, California: Sage.
- HALDANE, M. J. (2005) Analysing the art of teaching through real-time lesson observation via the medium of the interactive whiteboard. *British Educational Research Association Annual Conference*. University of Glamorgan, Education-line.

- HARGREAVES, A. (2003) *Teaching in the Knowledge Society: Education in the Age of Insecurity*, New York: Teachers College Press.
- HARRISON, J., LAWSON, T. and WORTLEY, A. (2005a) Action Research and the Professional Development of Induction Tutors: some unforeseen impacts and pitfalls. What Do We Learn? *Journal of In-service Education*, **31**(1), 83-103.
- HARRISON, J., LAWSON, T. and WORTLEY, A. (2005b) Facilitating the professional learning of new teachers through critical reflection on practice during mentoring meetings. *European Journal of Teacher Education*, **28**(3), 267-292.
- HARRISON, J. K., LAWSON, T. and WORTLEY, A. (2005c) Mentoring the beginning teacher: developing professional autonomy through critical reflection on practice. *Reflective Practice*, **6**(3), 419-441.
- HATCH, T. and GROSSMAN, P. (2009) Learning to Look Beyond the Boundaries of Representation: Using Technology to Examine Teaching (Overview for a Digital Exhibition: Learning From the Practice of Teaching). *Journal of Teacher Education*, **60**(1), 70-85.
- HAWKES, M. and ROMISZOWSKI, A. (2001) Examining the Reflective Outcomes of Asynchronous Computer-Mediated Communication on Inservice Teacher Development. *Journal of Technology and Teacher Education*, **9**(2), 283-306.
- HEARNshaw, D. (2000) Effective desktop videoconferencing with minimal network demands. *British Journal of Educational Technology*, **31**(3), 221-228.
- HEATH, M. J. and HOLZNAGEL, D. (2002) K-12 videoconferencing, Interactive Videoconferencing: A Literature Review. A Policy Issues Review by Kirk deFord K. Victoria Dimock. *Prepared for the k-12 National Symposium for Interactive Videoconferencing*. Dallas, Texas.
- HENDERSON, M. (2006) Fostering community cohesion to sustain small scale online professional development courses. *Australian Educational Computing*, **21**(2), 9-15.
- HENDERSON, M. (2007) Sustaining online teacher professional development through community design. *Campus-Wide Information Systems*, **24**(3), 162-173.
- HENDERSON, M. and BRADEY, S. (2008) Shaping online teaching practices: the influence of professional and academic identities. *Campus-Wide Information Systems*, **25**(2), 85-92.
- HERNANDES, C. A. and FRESNEDA, P. S. (2003) Main Critical Success Factors for the Establishment and Operation of Virtual Communities of Practice. *3rd European Knowledge Management Summer School*.
- HERON, J. and REASON, P. (1997) A Participatory Inquiry Paradigm. *Qualitative Inquiry*, **3**(3), 274-294.
- HERRINGTON, A., HERRINGTON, J., KERVIN, L. and FERRY, B. (2006) The design of an online community of practice for beginning teachers. *Contemporary Issues in Technology and Teacher Education*, **6**(1), 120-132.
- HERRINGTON, J. and KERVIN, L. (2007) Authentic learning supported by technology: 10 suggestions and cases of integration in classrooms. *Educational Media International*, **44**(3), 219-236.
- HILDRETH, P., KIMBLE, C. and WRIGHT, P. (2000) Communities of practice in the distributed international environment. *Journal of Knowledge Management*, **4**(1), 27-38.
- HIXON, E. and SANBORN, S. (2005) Using Video-based Cases to create a Virtual Field Experiences. *19th Annual Conference on distance Teaching and Learning*. Indiana University, The Board of Regents of the University of Wisconsin system.
- HIXON, E. and SO, H.-J. B. (2009) Technology's role in field experiences for preservice teacher training. *Educational Technology and Society*, **12**(4), 294-304.

- HOBSON, A. J., MALDEREZ, A., TRACEY, L., GIANNAKAKI, M., PELL, G. and TOMLINSON, P. D. (2008a) Student teachers' experiences of initial teacher preparation in England: core themes and variation'. *Research Papers in Education*, **23**(4), 407-433.
- HOBSON, A. J., MALDEREZ, A., TRACEY, L., KERR, K. and PELL, G. (2008b) Becoming a Teacher: Student Teachers' Preconceptions and Early Experiences in Schools. *Department for Children, Schools and Families, Research Report Brief RB673*.
- HOLMES, B., TANGNEY, B., FITZGIBBON, A., SAVAGE, T. and MEHAN, S. (2001) *Communal Constructivism: Students constructing learning for as well as with others*. Centre for Research in IT in Education, Trinity College Dublin, Ireland.
- HORD, S. M., RUTHERFORD, W. L., HULING-AUSTIN, L. and HALL, G. E. (1987) *Taking Charge of Change*, Published by the Association for Supervision and Curriculum Development, Alexandria, Virginia.
- HOUSE OF COMMONS EDUCATION AND SKILLS COMMITTEE (2004) Secondary Education: Teacher Retention and Recruitment: Government Response to the Committee's Fifth Report of Session 2003–04. London: The Stationery Office Limited.
- HRAMIAK, A. (2010) Online learning community development with teachers as a means of enhancing initial teacher training. *Technology, Pedagogy and Education*, **19** (1), 47 - 62.
- HU, C., WONG, A. F., SHARPE, L., CRAWFORD, L., GOPINATHAN, S., MOO, S. N. and KHINE, M. S. (2001) Multipoint Desktop Videoconferencing for Teacher Training: A Singapore Experience. *13th ED-MEDIA World Conference on Educational Multimedia, Hypermedia & Telecommunications*. Tampere, Finland.
- HU, C. and WONG, A. F. L. (2006) Video Conferencing by Student Teachers: Does It Make Any Difference? *New Horizons in Education*, **53**, 42-56.
- HU, C., WONG, A. F. L., SHARPE, L., CRAWFORD, L., GOPINATHAN, S., KHINE, M. S. and MOO, S. N. (2002) Building a Learning Community via Videoconferencing. *Proceedings of the International Conference on Computers in Education (ICCE'02)*.
- HUNG, D. and TAN-SENG, C. (2004) Bridging between Practice Fields and Real Communities through Instructional Technologies. *International Journal of Instructional Media*, **31**(2), 167-175.
- HUNG, D. and VICTOR, D. T. C. (2002) Learning within the Context of Communities of Practices: A Re-Conceptualization of Tools, Rules and Roles of the Activity System. *Educational Media International*, **(39)**3, 247-255.
- HUSU, J. (2000) Supporting remote communities with a shared virtual classroom: a view of social contexts. *Journal of Information Technology for Teacher Education*, **9**(2), 255-267.
- JA.NET TRAINING (2008) *Course Material: Technical Support of Videoconferencing*, The JNT Association 2008. *Effective Network Training*.
- JENNINGS, M. and BRONACK, S. C. (2001) The Use of Desktop Video Conferencing as a Medium for Collaboration between Beginning Instructional Designers and Intern Teachers. *International Journal of Educational Telecommunications*, **7**(2), 91-107.
- JENNINGS, S., DUNNE, R. and MCSHEA, J. (1997) Designing a telematic learning environment in a social constructivist paradigm *Education and Information Technologies*, **2**(4), 307-325.
- JOHNSON, T. E., MARING, G. H., DOTY, J. H. and FICKLE, M. (2006) Cybermentoring: Evolving High-End Video Conferencing Practices to Support Preservice Teacher Training. *Journal of Interactive Online Learning*, **5**(1), 59-74.
- JYRHÄMÄ, R. (2003) Class teacher education in a virtual university - an academic programme, learning through work *Paper presented at the European Conference on Educational Research*. University of Hamburg, Education-line internet document collection.

- KAMAKARI, A. and DRIGAS, A. (2010) Video Conferencing and Knowledge Management in In-Service Teacher Distance Lifelong Training and Development. IN LYTRAS ET AL. (Ed.) *1st International Conference on Reforming Education, Quality of Teaching and Technology-Enhanced Learning: Learning Technologies, Quality of Education, Educational Systems, Evaluation, Pedagogies, TECH-EDUCATION*. **73**, 610–619.
- KELLY, K. (1994) Out of Control: The New Biology of Machines, Social Systems, and the Economic World. Reading MA: Addison-Wesley. [online version] Available: <http://www.kk.org/outofcontrol/> [Accessed 26/8/2010].
- KELLY, P. (2006) What Is Teacher Learning? A Socio-Cultural Perspective. *Oxford Review of Education*, **32**(4), 505-519.
- KELLY, P., GALE, K., WHEELER, S. and TUCKER, V. (2007) Taking a stance: promoting deliberate action through online postgraduate professional development. *Technology, Pedagogy and Education*, **16**(2), 153-176
- KEMMIS, S. (1980) The imagination of the case and the invention of the study. IN SIMONS, H. (Ed.) *Towards a science of the singular: essays about case study in educational research and evaluation*. Norwich, University of East Anglia. Centre for Applied Research in Education.
- KENNEDY, M. M. (2002) Knowledge and Teaching. *Teachers and Teaching*, **8**(3), 355 - 370.
- KENT, A. M. (2007) Powerful Preparation of Preservice Teachers using Interactive Video Conferencing. *Journal of Literacy and Technology*, **8**(2), 41-58.
- KIM, A. J. (2001) Design Strategies of Successful Communities [electronic version].
- KINNEAR, H., MCWILLIAMS, S. and CAUL, L. (2002) The use of interactive video in teaching teachers: an evaluation of a link with a primary school. *British Journal of Educational Technology*, **33**(1), 17-26.
- KIRSCHNER, P. A. and LAI, K. W. (2007) Online communities of practice in education. *Technology, Pedagogy and Education*, **16**(2), 127-131.
- KONG, S. C. (2010) Using a web-enabled video system to support student–teachers’ self-reflection in teaching practice. *Computers & Education*, **55**(4), 1772-1782.
- KVALE, S. (2007) *Doing Interviews, The SAGE Qualitative Research Kit*, London: Sage.
- KYNÄSLAHTI, H., KANSANEN, P., JYRHÄMÄ, R., KROKFORS, L., MAARANEN, K. and TOOM, A. (2006) The multimode programme as a variation of research-based teacher education. *Teaching and Teacher Education*, **22**(2), 246-256.
- LACEY, A. and LUFF, D. (2007) Qualitative Data Analysis. *Trent RDSU (Research and Development Support Unit)*.
- LAVE, J. and WENGER, E. (1991) *Situated Learning: Legitimate peripheral participation*, United Kingdom, Cambridge: University Press.
- LAWSON, T. and COMBER, C. (1999) Superhighways Technology: personnel factors leading to successful integration of information and communications technology in schools and colleges. *Journal of Information Technology for Teacher Education*, **8**(1), 41-53.
- LAWSON, T. and COMBER, C. (2010) Videoconferencing in English schools: one technology, many pedagogies? *Technology, Pedagogy and Education*, **19**(3), 315–326.
- LAWSON, T., COMBER, C., GAGE, J. and CULLUM-HANSHAW, A. (2010) Images of the future for education? Videoconferencing: a literature review. *Technology, Pedagogy and Education*, **19**(3), 295 - 314.
- LAWSON, T., COMBER, C., GAGE, J., CULLUM-HANSHAW, A. and ALLEN, T. (2004) Evaluation for the DfES video conferencing in the classroom project. IN BECTA (Ed.) *Final Report*. UK.
- LEASK, M. and YOUNIE, S. (2001) Communal constructivist theory: information and communications technology pedagogy and internationalisation of the curriculum. *Journal of Information Technology for Teacher Education* **10**(1-2), 117-134

- LEHMAN, J. D. and PHILLION, J. (2004) Bringing Diversity into the Teacher Education Classroom: Video Conferencing as a Tool for Distant Field Experiences. *SITE 2004, P3T3: Purdue Program for Preparing Tomorrow's Teachers to use Technology*. Purdue University.
- LEHMAN, J. D. and RICHARDSON, J. (2004) Making Connections in Teacher Education: Electronic Portfolios, Videoconferencing, and Distance Field Experiences. *Paper presented at the annual meeting of the Association for Educational Communications and Technology*. Chicago, IL, Purdue University. Department of Curriculum and Instruction. AECT SITE, 2004, P3T3: Purdue Program for Preparing Tomorrow's Teachers to use Technology.
- LEHMAN, J. D. and RICHARDSON, J. (2007) Linking Teacher Preparation Programs with K-12 Schools via Video Conferencing: Benefits and Limitations. *Paper presented at the annual meeting of the American Educational Research Association (AERA) Annual Meeting and Exhibition* in Chicago, Illinois, College of Education, Purdue University.
- LEMKE, C. (2009) Policy Brief: Teacher Learning through Collaboration and System Innovation. IN LEMKE, C. and LESLEY, B. (Eds.) *Advance 21st century innovation in schools through smart, informed state policy*. Los Angeles, Cisco Systems, Metiri Group.
- LINCOLN, Y. S. and GUBA, E. G. (1985) *Naturalistic Inquiry*, USA: Sage.
- LOUGHRAN, J. and BERRY, A. (2005) Modelling by teacher educators. *Teaching and Teacher Education*, **21**(2), 193-203.
- LUEG, C. (2000) Where is the Action in Virtual Communities of Practice? [electronic version]. Available: <http://www-staff.it.uts.edu.au/~lueg/papers/commdcscw00.pdf> [Accessed: 7/11/08]. *German Computer-Supported Cooperative Work Conference*.
- MALDEREZ, A., HOBSON, A. J., TRACEY, L. and KERR, K. (2007) Becoming a student teacher: core features of the experience. *European Journal of Teacher Education*, **30**(3), 225–248.
- MALDEREZA, A., HOBSONB, A. J., TRACEYB, L. and KERRC, K. (2007) Becoming a student teacher: core features of the experience. *European Journal of Teacher Education*, **30**, 225–248.
- MALONE, A. (2008) Developing Schools as Professional Learning Communities: Insights from Teaching and Learning for the Twenty-First Century- An Irish Professional Development Project 2003-2007. IN ASSOCIATION, E. E. R. (Ed.) *ECER 2008, From Teaching to Learning?*
- MARKHAM, A. N. (2004) Internet Communication as a tool for qualitative research. IN SILVERMAN, D. (Ed.) *Qualitative Research: Theory, Method and Practice*. London: Sage.
- MARSH, B., MITCHELL, N. and ADAMCZYK, P. (2010) Interactive Video Technology: Enhancing Professional Learning in Initial Teacher Education. *Computers and Education*, **54**(3), 742-748.
- MARTIN, M. (2005) Seeing is believing: the role of videoconferencing in distance learning. *British Journal of Educational Technology*, **36**(3), 397-405.
- MAXWELL, J. A. (2006) Literature Reviews of, and for, Educational Research: A Commentary on Boote and Beile's "Scholars Before Researchers". *Educational Researcher*, **35**(9), 28–31.
- MCDERMOTT, R. (2001) Knowing in Community: 10 Critical Success Factors in Building Communities of Practice. *Community Intelligence Labs*, [electronic version]. Available: <http://www.co-i-l.com/coil/knowledge-garden/cop/knowning.shtml> [Accessed: 7/11/2008].
- MILES, M. B. and HUBERMAN, A. M. (1994) *Qualitative Data Analysis: An Expanded Sourcebook*, USA: Sage

- MILLWATER, J. (2002) A Virtual Workplace: Connecting and challenging classroom, university and preservice teachers. Australia, Queensland University of Technology.
- MILLWATER, J. (2005) A Virtual Workplace: Connecting and challenging classroom, university and preservice teachers. *AARE Conference, the association for active educational researchers*. Parramatta, Australia.
- MOORE, J. and BARAB, S. (2002) The Inquiry Learning Forum: A Community of Practice Approach to Online Professional Development. *TechTrends*, **46**(3), 44-49.
- MOORE, J. A. and CHAE, B. (2007) Beginning teachers' use of online resources and communities. *Technology, Pedagogy and Education*, **16**(2), 215-224
- MOORE, M. G. (1997) Theory of transactional distance. *Theoretical Principles of Distance Education*, 22-38.
- NEUMAN, W. L. (2006) *Social Research Methods: Qualitative and Quantitative approaches*, USA: Person International Edition.
- NICHOL, J. and WATSON, K. (2000) Videotutoring, non-verbal communication and initial teacher training. *British Journal of Educational Technology*, **31**(2), 135-144.
- NOLAN, K. and EXNER, A. (2009) Exploring the real possibilities for virtual conferencing during student teacher field experiences. IN A. MÉNDEZ-VILAS, A. S. M., J.A. MESA GONZÁLEZ AND J. MESA GONZÁLEZ (Ed.) *Research, Reflections and Innovations in Integrating ICT in Education*. Badajoz, Spain, FORMATEX.
- O'CONNOR, K. A., ATKINSON, T. S., MATUSEVICH, M. N., GREENE, H. C., POPE, C. and GOOD, A. (2007) Voices in Videoconferencing: Technology Integration in Teacher Education Courses. *Journal of Computing in Teacher Education*, **23**(2), 45-52.
- OWSTON, R. D. (2009) Digital Immersion, Teacher Learning, and Games. *Educational Researcher*, **38**(4), 270-273.
- PLONCZAK, I. (2010) Videoconferencing in Math and Science Preservice Elementary Teachers' Field Placements. *Journal of Science Teacher Education*, **21**(2), 241-254.
- POTTER, R. and ROBERTS, D. (2007) Desktop Video Conferencing. IN BUSY TEACHER EDUCATOR GUIDES (Ed.) *ESCalate is a Subject Centre of the Higher Education Academy Network Supporting Teaching and Learning across the UK*. Bristol, Lancaster, ESCalate.
- POUNTNEY, R., PARR, S. and WHITTAKER, V. (2002) Communal Constructivism and Networked Learning: Reflections on a Case Study. Sheffield Hallam University.
- PRATT, N. (2008) Multi-point e-conferencing with initial teacher training students in England: Pitfalls and potential. *Teaching and Teacher Education An International Journal of Research and Studies*, **24**(6), 1476-1486.
- QUINTON, S.-R. and HOUGHTON, P. (2005) Augmenting the power of networked learning communities. In *'Sustainable communities and sustainable environments : envisioning a role for science, mathematics and technology education : proceedings of the Fourth International Conference on Science, Mathematics and Technology Education'*. Edited by D Fisher, D Zandvliet, I Gaynor and R Koul. Perth : Key Centre for School Science and Mathematics, Curtin University of Technology.
- ROWLEY, J., DYSARD, G. and ARNOLD, J. (2005) Developing a New Technology Infusion Program for Preparing Tomorrow's Teachers. *Journal of Technology and Teacher Education*, **13**(1), 105-123.
- SALAZAR, D., AGUIRRE-MUÑOZ, Z., FOX, K. and NUANEZ-LUCAS, L. (2010) On-line Professional Learning Communities: Increasing Teacher Learning and Productivity in Isolated Rural Communities. *Journal of Systemics, Cybernetics and Informatics*, **8**(4), 1-7.
- SALMON, G. (2005) Flying not flapping: a strategic framework for e-learning and pedagogical innovation in higher education institutions. *Alt-J* **13**(3), 201-218.
- SANTAGATA, R., ZANNONI, C. and STIGLER, J. W. (2007) The role of lesson analysis in pre-service teacher education: an empirical investigation of teacher learning from a virtual

- video-based field experience. *Journal of Mathematics Teacher Education*, **10**(2), 123-140.
- SCHÖN, D. (1987) *Educating the Reflective Practitioner*. Washington, DC. , American Educational Research Association.
- SCORDIAS, M. and MORRIS, P. (2005) Virtual Classroom Visits: Using Video Conferencing Technology to Enhance Teacher Education. *Presented at Midwest Regional Conferences*.
- SCRIMSHAW, P. (2001) Communal constructivist theory: a response to Leask & Younie. *Journal of Information Technology for Teacher Education*, **10**(1-2), 135-141.
- SHARPE, L., C, C. H., CRAWFORD, L., GOPINATHAN, S., KHINE, M. S., MOO, S. N. and WONG, A. (2003) Enhancing multipoint desktop video conferencing (MDVC) with lesson video clips: recent developments in pre-service teaching practice in Singapore. *Teaching and Teacher Education*, **19**(5), 529-54.
- SHERIN, M. G. and VAN ES, E. A. (2009) The influence of video clubs on teachers' thinking and practice. *Journal of Mathematics Teacher Education*, **13**(2), 155-176.
- SHULMAN, L. S. (1986) Those Who Understand: Knowledge Growth in Teaching. *Educational Researcher*, **15**(2), 4-14.
- SILVERMAN, D. (2004) *Qualitative Research: Theory, Method and Practice*, London: Sage.
- SIM, C. (2006) Preparing for professional experiences - incorporating pre-service teachers as communities of practice. *Teaching and Teacher Education*, **22**(1), 77-83.
- SQUIRE, K. D. and JOHNSON, C. B. (2000) Supporting Distributed Communities of Practice with Interactive Television. *Educational technology Research and Development*, **48**(1), 23-43.
- STAKE, R. E. (1995) *The art of case study research*, Thousand Oaks, London: Sage.
- STAKE, R. E. (2005) Qualitative Case Studies IN DENZIN, N. K. and LINCOLN, Y. S. (Eds.) *The Sage Handbook of Qualitative Research*. Third Edition, Thousand Oaks, California: Sage.
- STOLL, L., BOLAM, R., MCMAHON, A., WALLACE, M. and THOMAS, S. (2006) Professional Learning Communities: A Review of the Literature *Journal of Educational Change* **7**(4), 1573-1812
- STUCKEY, B., LOCKYER, L. and HEDBERG, J. (2001) The case for community : on-line and ongoing professional support for communities of practice. IN MAHONEY, M. J. (Ed.) *Education odyssey : continuing the journey through adaptation and innovation*. Open and Distance Learning Association of Australia.
- SUTHERLAND, L., SCANLON, L. A. and SPERRING, A. (2005) New directions in preparing professionals: examining issues in engaging students in communities of practice through a school-university partnership. *Teaching and Teacher Education*, **21**(1), 79-92.
- TEACHER TRAINING AGENCY (TTA) (2005) E-learning today for the teachers of tomorrow. IN TTA (Ed.) *Project reports*. UK.
- TEACHER TRAINING AGENCY(TTA) (2005) E-learning today for the teachers of tomorrow. IN TTA (Ed.) *Project reports*. UK.
- TEACHERS.TV (2004) Thousands of education programmes on TV and Online <http://www.teachers.tv/>. Education Digital, Department for Children, Schools and Families.
- TEACHING AND LEARNING OBSERVATORY (2004) TLO in association with the Training Schools Initiative. University of Nottingham, School of Education, [Web page] <http://www.nottingham.ac.uk/education/centres/crsflp/tlo> (Accessed 10/12/06).
- TRACEY, L., HOMER, M., MITCHELL, N., MALDEREZ, A., HOBSON, A. J., ASHBY, P. and PELL, G. (2008) Teachers' Experiences of their Second Year in Post: Findings from Phase IV of

- the Becoming a Teacher project. *Department of Education and Skills, Research Report DCSF-RR041*.
- TRAINING AND DEVELOPMENT AGENCY FOR SCHOOLS (TDA) (2007) Professional standards for Teachers: Why still sit in your career?
- VYGOTSKY, L. S. (1978) *Mind in Society: The Development of Higher Psychological Processes*, Cambridge, Massachusetts: Harvard University Press.
- WALKINGTON, J. and VANDERHEIDE, R. (2008) Enhancing the pivotal roles in workplace learning and community engagement through transdisciplinary 'cross talking'. IN BARROW, M. and SUTHERLAND, K. (Eds.) *HERDSA (Higher Education Research and Development Society of Australasia) 2008 : Engaging Communities*. New Zealand, ACER, Australia.
- WALLIMAN, N. (2005) *Doing your research project, A step-by-step guide for the first-time researcher*, 2nd edition, London: Sage.
- WATERS-ADAMS, S., WHITE, C. and BENNETT, R. (2009) Developing Learning Hubs to promote student teacher understanding of professional knowledge and skills. *TQEF Research-Informed Teaching Initiative*. University of Plymouth, Faculty of Education, School of Early Years and Primary Educational Studies.
- WEINSTEIN, I. M. and LICHTMAN, H. S. (2005) Emerging Technologies for Teleconferencing and Telepresence. *Wainhouse Research*.
- WELSH, E. (2002) Dealing with Data: Using NVivo in the Qualitative Data Analysis Process. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, 3 (2).
- WENGER, E. (1998a) Communities of Practice: Learning as a Social System. *The Systems Thinker*, 9(5).
- WENGER, E. (1998b) *Communities of Practice: Learning, Meaning, and Identity*, UK: Press Syndicate of the University of Cambridge.
- WENGER, E. (2006) Communities of practice: a brief introduction. [electronic version]. Available: <http://www.ewenger.com/theory/index.htm> [Accessed: 1/3/2011].
- WENGER, E. C. and SNYDER, W. M. (2000) Communities of Practice: The Organizational Frontier. *Harvard Business Review*, 78(1), 139-145.
- WHEELER, S. (2005) Creating Social Presence in Digital Learning Environments: A Presence of Mind? *Featured Paper for the TAFE Conference*. Queensland, Australia.
- WHEELER, S., KELLY, P. and GALE, K. (2005) The Influence of Online Problem-Based Learning on Teachers' Professional Practice and Identity. *ALT J Research in Learning Technology*, 13(2), 125-137
- WILKERSON, T. L. and ROGERS, D. W. (2003) Multiple Platform Videoconferencing to Support Teacher Education and Professional Development in Mathematics. *IFIP Working Groups 3.1 and 3.3 Working Conference: ICT and the Teacher of the Future*. St. Hilda's College, The University of Melbourne, Australian Computer Society, Inc.
- WOOD, D., BRUNER, J. S. and ROSS, G. (1976) THE ROLE OF TUTORING IN PROBLEM SOLVING. *Journal of Child Psychology and Psychiatry*, 17(2), 89-100.
- WRIGHT, N. and CORDEAUX, C. (1996) Rethinking Video-conferencing: Lessons Learned from Initial Teacher Education. *Innovations in Education & Training International*, 33(4), 194-202.
- WUBBELS, T. (2007) Do we know a community of practice when we see one? *Technology, Pedagogy and Education*, 16(2), 225 - 233.
- YIN, R. K. (2006) Case Study Methods. IN GREEN, J. L., CAMILLI, G. and ELMORE, P. B. (Eds.) *Complementary Methods for Research in Education*. 3rd Edition, Washington, DC: Taylor and Francis, Routledge.