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A Social Identity Approach to Learning with Classroom Technologies
(1 Volume)

By

Nicholas William David Bowskill
BA (Combined Honours), MSc

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College of Social Science
University of Glasgow

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Abstract

This inter-disciplinary study develops a group level approach to learning design and practice in the classroom. This is supported by the use of technology to support learners in their collaborative development of questions.

General use of these technologies has tended to focus on tutors setting questions and students responding. This thesis explores a more sophisticated view of these technologies using a student-generated perspective. Five case studies are presented including induction, professional development and placement review. These cases are each in different contexts.

This study also develops a group-level concept of learning design. This approach has a structural view of group learning which consists of different ways of organising interaction amongst the whole class. In addition, it also has a psychological view of group learning based around the psychological impact of group membership and different group-level perspectives. This is in contrast with conventional instructional design approaches to pedagogy which are based on representative individuals.

In response to this group-level approach, this study reviews individual and socio-cultural theories of learning on order to understand the interaction between individual and whole-group perspectives which are a feature of this practice. Social Identity theory is added to this as a potential bridge between these different theoretical frameworks.

Shared Thinking, the name given to this group-level practice, completes the design, theory and practice framework of this study. This practice points to the pedagogical complexity implied by new uses of classroom technologies discussed in this study. The combination of an instrumentalist and a social psychological aspect of pedagogy illustrate this complexity based around the development and manipulation of a shared sense of identity. The tutor's role therefore combines management of the process with the curation of social identity.

Contents

List of Tables	vii
List of Figures	viii
List of Appendices	ix
Acknowledgements	x
Author’s Declaration	xi
Chapter 1 Introduction to the Thesis	1
1. Overview	1
2. The Shared Thinking Technique	4
3. Social Identity Theory and Social Identity Approach.....	5
4. Hypothesis for this Thesis	6
5. The Research Methods Used	9
6. The Structure of the Thesis	9
7. The Role of Perspectives in this Thesis	18
8. Summary of the Chapter	24
Chapter 2 Literature Review Part 1 – Learning Theory	25
1. Introduction	25
2. The Individual Level.....	26
3. The Socio-cultural Level.....	33
4. Identity Level.....	45
5. Discussion	51
Chapter 3 Literature Review Part 2 – Group Learning and Technology	53
1. Introduction	53
2. Group Learning.....	54
3. Groups as a Learning Environment	57
4. Group Knowledge.....	60
5. Group Development.....	61
6. Problems of Group Learning	63
7. Group Learning Methods	64

8. Examples of Relevant Practice	68
8. Discussion	91
Chapter 4 Research Methods and Methodology	95
1. Introduction	95
2. Personal Background to the Research.....	95
3. Aims of this Research	96
4. Hypothesis for the Research.....	98
5. Research Methodology in this Thesis	99
6. Research Methods in this Thesis	100
7. Ethics.....	113
8. Data Analysis.....	114
9. Conclusion.....	120
Chapter 5 Case Study 1 – Induction and Transition in a New University	121
1. Introduction	121
2. The Case Study Context.....	123
3. Case Study Participants.....	125
4. Research Methods.....	126
5. Data Analysis.....	130
6. Discussion	157
Chapter 6 Case Study 2 – Work Related Learning for Support Staff	162
1. Introduction	162
2. The Case Study Context.....	163
3. Case Study Participants.....	163
4. Research Methods.....	164
5. Data Analysis.....	166
6. Discussion	193
Chapter 7 Case Study 3 – Induction and Transition at an Ancient University	194
1. Introduction	194
2. The Case Study Context.....	194

3. Case Study Participants.....	197
4. Research Methods.....	197
5. Data Analysis.....	202
6. Discussion	228
Chapter 8 Case Study 4 –Reflection on Student Teaching Placements	230
1. Introduction	230
2. The Case Study Context.....	232
3. Case Study Participants.....	235
4. Research Methods.....	236
5. Data Analysis.....	238
6. Discussion	271
Chapter 9 Case Study 5 – Review of Department Assessment Practices by Academic Staff	275
1. Introduction	275
2. The Case Study Context.....	276
3. Case Study Participants	277
4. Research Methods	277
5. Data Analysis.....	279
6. Discussion	304
Chapter 10 Synthesis of Findings in this Thesis	307
1. Introduction	307
2. Synthesis of the Individual Level	310
3. Synthesis of the Pedagogical Level	321
4. Synthesis of the Research Level.....	334
5. Conclusion.....	341
Chapter 11 Conclusion	345
1. Introduction	345
2. Engagement Theme	345
3. Belonging Theme.....	348

4. Theoretical Discussion 349

5. Learning Design..... 353

6. Pedagogy 357

7. Weaknesses in this Research 360

8. Future Work Identified by this Thesis 363

9. Final Remarks..... 367

List of Appendices..... 372

List of References..... 373

List of Tables

	Page
Table 1: Summary of Case Studies in this Thesis	12
Table 2: Overview of 3 Key Examples	70
Table 3: Instrumentalist versus Social Identity Approach to Learning Design	322
Table 4: Overview of Pedagogical Features of Different Case Studies	330

List of Figures

	Page
Figure 1: Social Identity Model of Learning Design	139
Figure 2: Before and after voting results on money related problems from final session	144
Figure 3: Voting Results Before and After for Concerns on Entering the University Reported by Year 2 Students	150
Figure 4: Voting Results Before and After for 1 st Years on the Issue of Solving Money Problems	153
Figure 5: Voting Results Before and After for 1 st Years on the Issue of Making Friends	155
Figure 6: Support Staff Concerns about Supporting PDP	188
Figure 7: Support Staff Opinion on the Value of Shared Thinking as Preparation for Reflective Writing	190
Figure 8: Concerns held on arrival at university in Morning Session	226
Figure 9: Concerns held on arrival at university in Afternoon Session	227
Figure 10: Early Years Evaluating Practice	260
Figure 11: Early Years Improving Practice	261
Figure 12: Early Years and future teaching	262
Figure 13: Later Years Evaluating Practice	264
Figure 14: Later Years Improving Practice	265
Figure 15: Early Years and future teaching	266
Figure 16: Early Years and Evaluating Practice	267
Figure 17: Later Years and Evaluating Practice	268
Figure 18: The Predictability of Voting Results	296
Figure 19: The influence of small group interaction on individual thinking	297
Figure 20: The influence of the whole-group view on individual thinking	299
Figure 21: Tutors in an academic department reviewing assessment and feedback	302
Figure 22: Uses of Classroom Technologies and Strength of Social-Identity	333
Figure 23: Bowskill's Social Identity Model of Learning	357

List of Appendices

Appendix 1:	Differentiating Respondents in Case Study 1	373
Appendix 2:	Differentiating Respondents in Case Study 5	373

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Author's Declaration

I declare that, except where explicit reference is made to the contribution of others, that this dissertation is the result of my own work and has not been submitted for any other degree at the University of Glasgow or any other institution.

Signature

A handwritten signature in black ink, appearing to read 'N. Bowskill', written in a cursive style.

Printed name: Nicholas Bowskill

Chapter 1: Introduction to the Thesis

1. Overview

From a personal view, I believe that there have been three phases which can be detected in the developing relationship between technology and learning. They are:

1. Online learning,
2. Mobile learning and
3. The technology-rich classroom.

In this thesis, I will suggest that the last of these three phases has yet to be fully recognised and that new approaches to learning design, new theories of learning and new learning practices are required.

As a thumbnail view of these three phases, the initial emergence of the internet gave rise to an idea of online learning. This was originally based upon the sharing of information and resources. It developed to include different ways of organising online discussion in support of learning. Arising from this, were ideas to do with collaborative and cooperative learning in networked environments. Theoretically, we also saw the emergence of ideas relating to communities of practice (Wenger 1998) and learning communities (Cobb 1994; Hord 1997; Bielaczyc and Collins 1999; Bowskill, McCarty et al. 2000; Bowskill 2005; McConnell 2006; De Laat, Lally et al. 2007).

The mobile telephone (including similar connectable and portable devices) has since developed the initial view of the internet given above. This development provided each individual with the possibility of connecting to the online environment from anywhere and at any time. These devices became a means of personalizing our involvement with the connected world for the purpose of learning. Reflecting such developments, this gave rise to learning theories such as Connectivism (Siemens 2005) and Game Theory (Fudenberg and Tirole 1991; Fudenberg and Levine 1998).

My personal impression, over the last 20 years of formal involvement in learning with technology is that the ubiquity of technology for development has given rise to a reaction against formal education in institutional settings. The popular argument seems to be that the classroom and formal education is largely out of touch with the modern world of work and the learning needs of society.

The technological argument is that because we can work from anywhere, rather than being fixed to a particular place, we can be liberated from institutional restrictions. This is evidenced by the increasing interest in informal learning with social media.

Moving on from there, I conceptualise a newer third phase, which is the main focus of this thesis. I refer here to the technology-rich classroom (Hegedus and Penuel 2008; Mayer, Stull et al. 2009). Using this term, I am pointing to a classroom or physical space in which technology plays a role far beyond the presentation of information. This is a classroom in which interaction is supported by different technologies.

This return to a focus on the classroom is an opportunity to explore the role of technology for supporting social interaction for co-present learners. Specifically, this is an opportunity to work at the collective level for learning. As such, it is a shift away from the use of technology to connect to the outside world. It is also an alternative use of technology to one which supports the tutor in a lecture.

The concept of the technology-rich classroom is defined here by the changing nature of the technology and how it may be used. It is equally defined as a pedagogical tool. By this, I mean that it may function as one of several choices to work in a particular way as a whole-group. Just as a tutor may opt to use a lecture or a seminar so they might think about the technology-rich classroom as another approach to organising the classroom interaction. This way of working is one supported by interactive technologies.

I also see it is a way of thinking about the design of learning. This is a more profound view than looking at sequencing or management of people and apparatus. This is about the decision to develop collective thought as a learning resource for everyone involved. It is a design decision to work at a whole group level rather than focusing upon an individual level of learning.

If mobile technologies brought about the idea of learning ‘wherever, with whatever and whenever’ then the technology-rich classroom might be understood as ‘this group, right here and right now.’ I am proposing a group specific approach to development and learning support.

In this respect, the issue of identity is an important part of this thesis. Identity is no longer considered as attributes of an individual accumulated over time and developed through experience. I am proposing a view of identity that is as much about the group as it is about the individual in different settings. This will be discussed in detail in the next chapter and expanded throughout the thesis as the proposed basis for learning in the technology-rich classroom.

From an identity perspective, we might regard the first two of the three trends mentioned at the start of this chapter (online learning and mobile learning) as a shift from ‘who we are’ to ‘who I am.’ In the third, classroom-oriented approach, I am proposing that we might recognise the dialectical relationship between individual and group identities. This thesis will explore the significance, the value and the role of individual and social identity in the context of the technology rich-classroom.

1.1 The High-Level Aims of the Thesis

This thesis is an inquiry into the Shared Thinking technique which combines a snowball group-discussion process with the use of classroom technologies (see next section for details). Specifically, this is an investigation into the theoretical and practical implications

of using this technique for different purposes and in different settings. It is important to stress that both theory and practice are equally important in this thesis. In summary, the broadest aims of this thesis are:

1. To define an approach to learning design that is compatible with the technique
2. To define a theory or theories of learning which explain and fit with the idea of using this technique
3. To articulate an emerging practice aligned to the theory and the design approach in points one and two above.

2. The Shared Thinking Technique

It is important to distinguish between Shared Thinking as a technique, the emerging practice as a derivative of the technique, and the theoretical framework. This is vital in order to fully appreciate how these different elements inform and interact in this study.

The ‘core’ technique combines the use of a snowball group-discussion process with the use of classroom technology. Over the five case studies discussed in this study, several variations have been developed using the core technique as an ‘engine’ from which to develop a practice. That practice is retrospectively called Shared Thinking and the core ‘engine’ or technique which can be understood as an engine in these case studies is as follows:

- Individuals write down their personal view on the topic-focus
- Move into small groups to share individual views
- Each group identifies one aspect to be recorded on the screen
- Create a set of question-options from the discussions
- Each individual votes on the aspect they see as most significant
- Voting generates a pie-chart on the public screen
- Plenary discussion on issues arising

The Shared Thinking practice is the way of using, varying and manipulating the above technique. It was introduced in the first case study. It was developed and used in series, across different sessions and across different groups.

The practice involves a procedural element in the way the technique is used. This includes the use of that technique in different situations, for different student numbers and for different applications. On the one hand, this practice has a structural view of group learning that involves the management of the process and its component parts (working at individual, small group and whole-group levels).

On the other hand, the practice also has a psychological element as it seeks to invoke a sense of group membership in the minds of each participant. This also involves tutors in both facilitation and the curation of social identity. This latter point refers to the way in which the tutor might organise different views of the group on different issues and relative to other alternative group-perspectives.

The ‘engine’ and the Shared Thinking practice are distinct from Social Identity theory. This theory is retrospectively proposed as a useful and appropriate way of explaining and exploring the Shared Thinking practice.

3. Social Identity Theory and Social Identity Approach

This theoretical framework is discussed in greater detail in chapter two of this study. However, it is important to understand the distinction made between the use of the word ‘theory’ and the use of the word ‘approach.’ These are used in particular ways in the literature.

Social Identity Theory was originally developed by Henri Tajfel (Tajfel 1969; Tajfel 1974). It was used as a way to explain the influence of groups, group favouritism and

social prejudice. Since its inception, this has been expanded to include other ideas and theories.

John Turner worked with Tajfel and developed the original ideas to include Self-Categorization Theory (Turner 1975). Turner's contribution provided a psychological account which helped to explain Tajfel's original work.

These two theories, social identity theory and self-categorization theory taken together, have become known as a Social Identity Approach. In this study, I have used 'approach' in the title of this study to indicate that both are applied to the use of classroom technologies.

4. Hypothesis for this Thesis

According to Kerlinger, a hypothesis provides a 'conjectural statement between two variables' and in such a way that they can each be investigated in relation to each other. A hypothesis may be used to organise a piece of research helping to gather and analyse appropriate data (Kerlinger 1986).

Cohen & Manion have discussed the hypothesis as 'an educated guess' but one that has come about through 'extensive study, reflective thought and observation' (Cohen and Manion 1994). A hypothesis in that way can be seen as an intuitive hunch.

The notion of a hypothesis in this thesis is as a claim that can be explored in a structured manner. The hypothesis forms the basis for an argument that will be explored through an investigation of the literature, planned interventions in relevant real-world settings, and as a result of data gathering and analysis.

The overall claim, in this thesis, is constructed from two interdependent sub-claims. The research discussed here is an attempt to substantiate each of these two sub-claims. If they are both upheld then we may have a means to verify or deny whether the overall hypothesis is supported.

4.1 Origins of the hypothesis

A sampling of the literature provided some formative ideas about the issues and practices relating to voting technologies (Caldwell 2007; Stowell and Nelson 2007; Hoekstra 2008; Keller 2008; Mayer, Stull et al. 2009; Walker and Barwell 2009; Killos, Hancock et al. 2010; Patterson, Kilpatrick et al. 2010). In addition, I also investigated related technologies and practices discussed in the context of the technology-rich classroom (Stroup 2002; Stroup, Ares et al. 2004; Stroup 2005; Stroup, Ares et al. 2005; Stroup, Ares et al. 2007; Carmona and Dominguez 2008; Ares, Stroup et al. 2009). These were practices and research not restricted to cases involving voting technologies.

The Shared Thinking learning design was initially an ad-hoc approach that was tried out in the very first session in the first case study presented in this thesis. That initial trial generated an awareness of a variety of issues viewed from different perspectives.

The hypothesis, including the articulation of the three areas of impact (learning, teaching and research), are the initial outcome of an attempt to understand the literature and that initial experience of implementation. This structure was carried through the different case studies described in this thesis.

4.2 Structure of the hypothesis

Here the overall claim made here has two broad parts. Firstly, we might use technology in the classroom to extract the diversity of thought within the whole group. If that claim is

upheld then my second claim is that we may have a new basis for learning, teaching and research. Hence the hypothesis is fully articulated as follows:

If we can extract the diversity of thoughts and feelings in the classroom, derived from a process of reflective dialogue amongst everyone involved, and if by using technology we make them visible such that they can be used as a resource, then we may have a new basis for learning, teaching and research.

If the first sub-claim is upheld (that we can indeed extract the diversity of thought in the classroom) then the second claim will be explored to see whether that sub-claim is also true. If both sub-claims are supported then the thesis will be an inquiry into the nature of learning, teaching and research under such conditions. Learning, teaching and research are three key levels that are used in order to provide a framework for analysis in this thesis.

From the literature on using handheld technology in the classroom I have identified a set of features that serve as questions about the technology rich classroom (Hegedus and Kaput 2002; Stroup 2002; Hegedus and Kaput 2003; Ackermann 2004; Stroup, Ares et al. 2004; Stroup 2005; Stroup, Ares et al. 2005; Hegedus, Kaput et al. 2007; Stroup, Ares et al. 2007; Carmona and Dominguez 2008; Hegedus and Penuel 2008; Ares, Stroup et al. 2009; Roschelle, Knudsen et al. 2010).

That particular literature was chosen because it looks beyond conventional uses of technologies such as electronic voting systems to other handheld technologies. I am proposing the use of electronic voting systems for reflection in a way similar to the literature under consideration.

That literature is discussed in more detail in chapter three. For now it may be enough to point out that the focus in that literature is on social and cultural aspects of classroom technology. This seems to have ideas in common with the use of technology I am proposing in this thesis.

5. The Research Methods Used

This is an investigation into the Shared Thinking technique. The ‘core’ technique itself provides the structure for interviews across different case studies. The technique varied across different case studies because it was a test of pedagogical potential and psychological effects.

A case study approach was used as a core strategy to frame the collection of data. Within each case study interviews, observation notes and pie-charts were the main sources of data. Questionnaires were used in some cases. Telephone and face to face interviews were also used to gather data. The technology also captured data in the pie-charts.

This research was undertaken as an opportunity to develop my practice as an independent learning consultant. My consultancy is concerned with the relationship between technology and learning. My previous experience was in the area of online learning. I was therefore using this opportunity to explore and develop my practice in the classroom.

6. The Structure of the Thesis

This research was based in the School of Education. It also had an inter-disciplinary element with supervision shared between Education, Computing Sciences and Psychology. The literature review sampled research drawn mainly from Education and Psychology. For this reason, the literature review is not a comprehensive discussion of one area. That would be at once impractical and inadequate for this purpose.

The set of case studies reported here represents my efforts to understand the initial ideas from the research proposal which was to explore the idea of students developing their own questions. It was clear at the end of the first session that there were pedagogical and

theoretical issues to be considered. The other case studies, of which there are five in this thesis, therefore constitute the resulting struggle to understand that initial experience. The empirical work of this whole thesis is an effort to try and give a form to my early thoughts about that first intervention. This was certainly not articulated at the start. In fact, none of this was clear at the start but that initial experience suggested different ways one might investigate the process.

The impact upon the individual was one dimension that suggested itself. This initial implementation was a change in the way participants in that first case study had worked before so it seemed reasonable to explore the different ways it affected the learners.

At the same time, the first session also presented a distinct way of organising interaction in the classroom. This suggested a collective dimension as a way of thinking about designing classroom interaction. It suggested this was a way for a whole-group to work *through* the technology (Crook 1996).

The research is therefore a rolling investigation into different aspects of the initial learning design and the dialectic between each individual and the group as a whole. The case studies were seen as opportunities to dig more deeply into different facets of the design. This thesis is an attempt to understand the initial perceptions of that first intervention as an emerging approach to learning.

For these reasons, the case studies are not presented as a test of quantitative validity. They each represent the exploration of different facets of the emerging learning design as piloted in that first case study. Specifically, these relate to structural issues and psychological issues. In this sense, there is a naturalistic validity in which each implementation was an investigation into the pedagogical issues raised by running the learning design in different and particular settings. The background was a search for a theoretical explanation of the ways in which the practice appeared to work.

The unit of analysis is the Shared Thinking technique. The aim is to understand the impact it may have across different settings. I am interested in the structural and psychological aspects of this process in different naturalistic settings.

For this reason, the focus is on the hypothesis. If it is possible to extract the thoughts and feelings of the group then it will lead to an inquiry into implications for design, theory and practice.

The Starting Point for this Thesis

Chapter Two provides a literature review for individual and socio-cultural theories of learning. Individual theories include a review of Constructivism and Social Constructivism. Socio-cultural theories of learning include Activity Theory and Situated Learning. Social Identity Theory is discussed as the bridge between individual and socio-cultural theories.

Retrospectively, my aim is to reconcile the individual mind with the social environment in the classroom. Using the Shared Thinking approach, these perspectives interact and inform each other to articulate a set of group specific situated social norms. Those situated norms provide a basis for relational development through selective comparison between each individual and the group.

Chapter Three provides a literature review of structural perspectives on group-learning. This aims to complement the theoretical review put forward in Chapter Two. That third chapter includes a discussion of Charles Crook's examples of Collaborative Learning (Crook 1996; Crook 1998); Ritchhart and colleagues work on Making Learning Visible (Ritchhart 2007; Ritchhart and Perkins 2008); David McConnell's work on Networked Learning Communities (McConnell 2000; McConnell 2006) and the work of Walter Stroup and Colleagues on networked-mediated classrooms (Stroup 2002; Stroup, Ares et al. 2004; Carmona and Dominguez 2008; Ares, Stroup et al. 2009).

Chapter Four presents the research methods used for this study. This chapter provides a view of the case study methods used and also provides an account of the variations in data-gathering for the different case studies. This difference was due to the changes in the level of focus within a given case study. Different data was gathered because each case revealed new issues which were then addressed in the subsequent part of the investigation. Table 1 below presents a summary/overview of the case studies. These are described in more detail underneath the table.

Table 1: Summary of Case Studies in this Thesis

Case Number	Chapter Number	Overview
Case Study 1	Chapter 5	Induction & Transition, New University, 27 2 nd year and 35 1 st year Health Science students
Case Study 2	Chapter 6	c. 12 Support Staff, representing different institutions, Higher Education Conference
Case Study 3	Chapter 7	c.500 students, ancient university, induction and transition
Case Study 4	Chapter 8	27 Early Years Primary Specialists, Student-Teachers, 37 Later Years Primary Specialists Student teachers, new university
Case Study 5	Chapter 9	Old University, Academics, Reviewing Assessment Practices, c.15 tutors

Chapter Five presents the first case study. This was applied to induction and transition in Health Sciences at a new university. This was in some ways the most important as it was the first test of the learning activity that subsequently developed into a learning design tool. The distinction between an activity and a design is largely down to the degree of conceptual thinking being applied.

In the early stages of implementation, the Shared Thinking approach was regarded as a different form of group learning activity. The activity could be changed in different ways but my view of it was structural. It was effectively a lesson-plan for people to work collaboratively in a classroom supported by technology.

The theoretical implications were not apparent in the initial case study. I have since understood a set of guiding principles behind the use of the Shared Thinking approach. I named them as a psychosocial approach to learning design (see below in section eight for a discussion of this design approach). This is an approach to design that is invested in the idea of mutual help and influence. It is an approach to learning design that is focused upon the ideas of a particular group rather than the idea of developing individual learning capacity in isolation.

That first case study began with an interview with tutors to explore the possibilities of trialling the activity with students. The main concern held by the tutors and identified in that interview was that students were not taking the time to reflect outside the classroom. The tutors were also concerned that students also failed to recognise their peers as a source of support.

It was these issues that turned the view of the Shared Thinking activity into a process of collective reflection. In other words, my initial thoughts about the activity design were shaped by the negotiation and by the contextual issues.

Emerging from this initial experience was the sense that this activity provided a way of working as a whole-class. It was immediately apparent that the activity went beyond the initial requirement of generating a productive conversation amongst the students. It was instead, a way of organising learning that brought the whole-class together in a spirit of shared investigation.

I subsequently explored this issue of supporting whole-group work. This took me through the literature on reflective practice; literature relating to the use of technology to support reflection; and management literature on organisational learning.

From this last literature-set, others have emerged discussing the idea of 'Organizing Reflection' as a way of sharing responsibility for reflection in institutional settings (Gear, Vince et al. 2003). These authors argue for this on the grounds that there are benefits for all involved. By convening collective reflection the institution is better able to solve collective challenges by pooling distributed knowledge. This prompted me to think about an approach to learning design oriented towards the whole-group as much as to the individual.

Chapter Six presents a different case study. This time we left the confines of the institution and took the activity into an academic conference. These delegates were learning support staff in different universities. They each had the responsibility of supporting student development in their institutions.

The research question here was to what extent might this Shared Thinking approach (the initial activity was modified for each case study whilst retaining the same structural core) fit into a staff context? Would it be useful as a means of reflecting together on separate practices? Ultimately I wanted to know how robust was the emerging design? How flexible could it be in adapting to different social and practical contexts?

The first case study was so focused upon trialling the activity structure that I neglected to gather data on the nature of the dialogue that happened in the session. A goal for this next case study was to address this gap and to try and understand the nature of the dialogue in the small groups. Did participants really engage with the issues or not? Would they really benefit from this process or could they reflect together without the need for such orchestration?

The activity in this case study had a parallel goal. On the one hand, it was intended that it might help the discussants reflect together on their professional experience. This was a similar purpose for the students in the initial case study. On the other hand, it was intended to offer a possible model that the discussants might consider for their local practice with their students. A secondary research question was to what extent was the session useful and to what extent was the activity transferable?

Chapter Seven was back in a university context. Again, there were significant differences from the previous case studies. This time the setting was an ancient institution in Scotland. The numbers involved were also significantly different. This case study involved sessions with several hundred students.

The basic aim of this case study was to see if the activity would fit into a research-led university and pure science context. We were also interested the issues of scale and structure. What difference does it make having a one-session versus a two session structure for induction using this activity? What differences are there when deploying this approach with large numbers of students – for all concerned?

Chapter Eight finds us back at the same new university in England where we started in the first case study. However, the micro-context was quite different. This case study was an activity on a course for teacher-trainees in their final year.

We had already tested the value of the model for students in the earlier years of a course in the first case study. This time we sought to understand whether the approach had any value for later years' students. This was also a different subject domain to those before. These students were in the School of Education.

Of particular interest in this case study was the use of the Shared Thinking strategy to support a collaborative review of teaching placements. Did this model have any value or applicability to reviewing distinctly separate experiences outside the university? We had

explored this idea for staff at an academic conference in the second case study. Those tutors were pooling their thoughts on their practice. In this case study, we explored the idea for students on work-placements. It also provided another opportunity to record small group discussion in order to obtain some insights into the nature of the dialogue in those student groups.

Our research questions related to the value and impact of the activity for students and the utility of the activity to support the collective review of individual experiences. This is an important issue in the context of situated learning (Brown, Collins et al. 1989) that suggests learning in one context is not transferable to another. We are also interested in to what extent the activity has value for later years students.

The final case study in this research appears in Chapter Nine. The aim here was to re-visit possible applications of Shared Thinking for staff. This time the application was for academic staff in a university department.

The Shared Thinking approach was used to collaboratively review feedback and assessment practices in the department. There was some interest, amongst the participating staff, in using this session to review overall course provision relating to assessment. Again the small group discussions were recorded. Would established academic staff feel this was a useful opportunity to review practices or would they feel such things were already understood or better addressed in another format?

By this time, we had become very comfortable with the activity format and we had varied it across the different case studies. We were aware of the distinction between using the technology to assess an audience and using the same technology, with the Shared Thinking approach, to explore their experience. In this case study we combined the 2 different models for using the technology (teaching and reflection). We ran the reflective session and then evaluated it using the teaching mode. One of the resulting questions was how useful was it to combine modes and to use the teaching mode to evaluate the reflective mode? Could we use the teaching mode to investigate the reflective mode?

One of the aims in this case study was to develop an experiential workshop for professional development around the Shared Thinking approach. The earlier case studies suggested the model was effective in a variety of contexts. It appears to have value for staff and students. It appears useful for induction, transition and placement review. If this model has such widespread value it makes sense to think about how to support staff in the adoption of this approach. What would a professional development workshop look like for Shared Thinking? This was another research question.

Chapter ten looks across these different case studies and draws out themes and findings at the micro-level (relating largely to effects upon individuals from participation) and at the macro-level (relating to the organisational effects of the model) for tutors, support services and researchers. This pooling of experience that occurs as part of this model has a variety of effects – emotional and cognitive – upon all those interested and involved.

Chapter eleven will conclude by summarising the discussion and the findings. Specifically, this closing chapter will reflect upon the emerging practice, model and theory of Shared Thinking discussed in the preceding chapter but to this will be added new directions for future research. Specifically it will present the idea of psychosocial learning design, social identity theory and the Shared Thinking practice for the technology-rich classroom.

This final chapter will seek to indicate a new research agenda emerging from this new approach to collective learning and reflection. There is certainly a new area of comparative research waiting and needing to be done at this collective level. The Shared Thinking approach has provided a practical, participative and engaging way of interacting with whole-groups that yields insights within and between different cohorts. The products of this process facilitate intra- and inter-organisational research exploring different subject areas and faculties as well as the experiences of specific cohorts as they journey through a course. Equally we are now able to explore multiple cohorts passing through a specific part of a course at the collective level.

In this closing chapter I will return to the themes that began this first chapter to forge new connections between this study and that earlier experience. The aim will be to show both continuity and development.

7. The Role of Perspectives in this Thesis

The Shared Thinking practice, as the focus of this study, involves multiple perspectives. Each individual begins by writing down their personal view. These individual perspectives are shared and discussed in small groups. From those conversations, each small group forms a view which is shared verbally and recorded on the screen. The basic process is completed by the voting activity which generates a whole-group perspective.

From this brief summary of the core ‘engine’ we can see how the idea of perspective forming and perspective-taking is already a highlight and potentially significant in this study. As a consequence, I will briefly review the concept of perspectives in the literature. This will provide a platform for the discussion which follows in the next chapter.

What is a Perspective?

A perspective is a view we hold of a given phenomenon. This does relate to issues of identity, but in this thesis identity is viewed as context-sensitive (Steele 1997). The individual is viewed as having a foundation of views and narratives (Sfard, Nesher et al. 1998) but these are sampled and deployed in the form of a perspective. This perspective is an orientation to the perceived social situation. Perspectives may change, each time, with or without the same people involved.

In this sense, perspectives are a form of knowledge. The social world comprises a multitude of diverse views. These views define or describe our current relationship with events, objects and people. This includes views about abstract and concrete phenomenon.

Perspectives contain feelings (emotion) as well as thoughts (cognitive action). Put another way, emotions and thoughts are also regarded as perspectives in this thesis.

Perspectives change with time and through interaction with others. Our views change with, about and through interaction with others. According to Gillespie (Gillespie 2008), this interaction can occur through reflection upon our own experiences and past views (first person perspectives); through discussion or observation of others (second person perspective). Perspectives passed down through time or communicated through different media can also be influential (third person perspective).

Perspective-Taking

There are a number of different ways we might discuss perspective-taking. The first of these is cognition-based and the second is socially-constructed between two people. The third conception relates to perspective-taking as a collective or cultural construction.

Piaget described an experiment in which a child was asked to imagine being sat in a different position (Piaget and Inhelder 1969). The task for the child was to describe the view as it might appear if they were looking at a model from the other side. This is sometimes called position exchange (Gillespie 2008).

Vygotsky describes how a shared understanding developed between a tutor and a learner can serve as a co-constructed perspective (Vygotsky 1978). That joint view is a hybrid of different perspectives which mediates between discussants and informs each individual's thinking.

Turner describes a process by which we align to the social norms of a group or culture (Turner, Oakes et al. 1994). Those social norms equate to the shared beliefs or perspectives

within the collective body. This group-perspective mediates between all members of a social group.

Perspectives and Learning

Elicitation of the learner's view is a central component of many approaches to learning and teaching. We see this in popular models of learning such as Laurillard's Conversational Framework (Laurillard 1993). This was originally a tutor-student interaction. The model was modified later to take account of group-work (Laurillard 2009).

In both cases, Laurillard's model has the tutor seeking to elicit the view of the learner in order to make further input. The learners are following an agenda set by the tutor. As such we might argue that students have the task of learning that which is inside the tutor's head.

This thesis will seek a model based on students as the co-constructors of the learning agenda. The aim here is to learn what is inside the head of their peers via the development and communication of the collective identity. The reason for doing this will be to help students relate their thinking to that of their peers through a process of identification.

Piaget (Piaget and Inhelder 1969; Piaget 1977) also stated the learners should be inventors and not conformists . This view stands central to the thinking throughout this study and in contrast to the exploration, by students, of the tutor's mind.

The discussion to date, has aimed to show how learning might be understood as the task of relating different perspectives and relating perspectives to your own view. This assumes that this is a straight-forward task or that it is, at least, simple to understand. In the next section, I want to explore the realities of relating different perspectives in our minds. I am suggesting that this is a complex issue upon which the success of a learning design may depend.

Key Variables in Perspective-Taking

There are a great many factors that influence our ability to consider different perspectives. At the same time I am making the case that relating different perspectives to our own view is central to the learning process. The discussion below is drawn from an excellent paper elsewhere (Heit and Hahn 2001). What follows is my summary of their discussion.

The number of available perspectives is an issue. If we ask two friends for their view they may be trustworthy but are they representative? On the other hand, if we have a hundred views it may be too many to manage.

The diversity of available perspectives is another factor. If we have 100 views from 100 different countries (1 from each country) we may be less certain of their local relevance when compared to 100 from a similar context to our own. The same is true for studying a subject. It may be more helpful to have different perspectives drawn from subjects in your own faculty compared with a few from unrelated subject areas.

A lot naturally depends on the nature of your task. There is obviously a balance to be struck. We may value having enough perspectives through which to draw a reliable conclusion. Too many and too much diversity can make our task difficult or it may dilute the validity of our conclusions.

Setting aside issues such as the number, quality and diversity of the available perspectives there are other cognitive issues to consider. These include the extent to which available perspectives converge or diverge from our own view. If the level of convergence is quite far from our own perception then it may not be recognised or it may not be within our mental reach.

Age and disability may also be factors in our ability to relate and process different perspectives. Older people, or those with a degenerative illness, may have more processing experience. They may have greater difficulty concentrating.

People may have different capacities for holding things in their memory in order to relate different perspectives. Research elsewhere, for example, suggests that short-term memory typically has a capacity of seven items ± 2 (Baddeley and Hitch 1974). This would suggest that the form and organisation of different perspectives may all impact on the ability to relate one to another.

Environmental and cultural factors may impact on our processing ability. Too many distractions during the act of relating to different perspectives might cause psychological noise. The construction of our own perspective may also be derived from our cultural and social background. This may give our perspective a particular shape that favours the accommodation of some perspectives more easily than others due to familiarity etc.

Finally, the form of perspectives may be an issue that impacts on our ability to process them and relate them to our own thinking. This may include the media that carry the perspective – audio, video, written or spoken language etc. It may also include the extent to which perspectives are abstract or concrete. Abstract views may be more difficult to process. Thinking is enhanced when the perspective of others is also made visible (Heit and Hahn 2001).

From the work of Heit and Hahn, we can offer a summary (below) of key factors in perspective-taking. All of these show how difficult it can be to meet the needs of different students in a class. They are:

- Number, Quality & Variety
- External Form (image, sound, text, conversation)
- Internal Form (shaped by social, cultural and personal histories)
- Situational Significance
- Level and form of Engagement
- Capacity of memory to act upon different views
- Relationship amongst different perspectives
- Visibility of perspectives

From the above, we can see that perspective-taking and the ability to relate different perspectives is important to learning. This is not a trivial task. The challenge for pedagogical practice is to provide support for the task in the classroom. Catering for diverse cognitive structures, mixed abilities and different backgrounds in a whole-class is therefore a central issue. It is one I hope to focus upon in this study of the technology-rich classroom.

8. Summary of this Chapter

I began the chapter by defining the technology rich classroom as a relatively new phase in the development of learning and teaching with technology. I highlighted the Shared Thinking technique as an illustration of this emerging practice.

I moved on to highlight the Shared Thinking technique as the focus for the study. I stated three high-level aims of this thesis which were to investigate design, theory and practice suggested by the use of this technique. Following on from that, I distinguished between the Shared Thinking technique and the Social Identity Approach as the theoretical framework to be used in the thesis.

A hypothesis was provided based on the initial trial of the Shared Thinking technique. That hypothesis set out certain claims to be explored in the thesis using a case study approach. Research questions were generated for each case study.

This was followed by a review of the role of perspectives in this study. That review was carried out as preparation for the inquiry into the ways in which perspectives interact in this emergent Shared Thinking practice.

In the next two chapters, I will look at different aspects of group learning. In chapter two, I will look at the theoretical aspects of group learning. That will involve an exploration of individual and socio-cultural theories of learning. On the other hand, in chapter three, I will look at the structural and pedagogical aspects of group-learning. Both these views may play an important part in our investigation into the Shared Thinking practice.

Chapter 2: Literature Review Part 1 – Learning Theory

1. Introduction

In this chapter, I will explore different theories of learning. My aim in doing so is to understand the adequacy of current theories to explain the Shared Thinking approach. This practice has been developed as the focus of this research.

The central tension in different learning theories is how best to reconcile the individual view of development with the social and cultural view. This is an issue faced by tutors in any classroom. Attempts to support diverse cognitive structures in a social context can be problematic. This is further complicated by calls to make learning relevant to society. Tutors need to relate the world of the classroom to the wider worlds of the discipline and work. This requires a considerable balancing act combining both local and global perspectives.

Shared Thinking, as a new practice, involves individual work, small group work and whole-class work. In some ways, this practice is a microcosm of the multiplicity of perspectives mentioned above. It has a great deal to do with the management and facilitation of different perspectives over time. These come from a variety of sources within the classroom and beyond.

Picking up on the issue of perspectives, this chapter will explore this as a theme for learning. Specifically, the aim here is to consider the role of *perspectives* in different theoretical frameworks. Those frameworks are organised into three levels of learning which are:

- The Individual Level
- The Socio-cultural Level
- The Identity Level

2. The Individual Level

In this section, I will look at a theory of learning that regards development as embodied. In other words, this section sees learning as something that happens inside the mind of a given individual (cognitive). This is also a view of learning in which the responsibility for development is mainly allocated to the individual.

In this review of individual-level theories, I will discuss perspective-forming as an independent activity for a learner (Constructivism). I will then extend that to consider perspective-forming in a tutor-learner relationship (Social Constructivism).

2.1 Constructivism

Piaget is probably the person most recognised for this theory. Constructivism is a theory of learning mainly centred upon internal change. It is a theory distinct from a behaviourist view of individuals in which we merely react to stimuli in the environment (Skinner 1974). In Behaviourism, there is a sense that the learner is trapped within their environment and merely playing out a pre-scripted drama. In Constructivism the individual has some agency through the decision to attend and process new information.

The Internal Change Process

According to this theory, when individuals encounter new information, which matters to that person, it may give rise to internal conflict. This is the experience of cognitive dissonance.

In order to resolve this tension, the individual must process the information to make sense of it in their own terms. Doing this involves adding the new information to the existing

mental structures. This is called assimilation. Alternatively, where the new information no longer seems to fit into the existing structures, a process of re-structuring is required. This is called accommodation (Piaget and Inhelder 1969; Piaget 1977). This can be broadly described as a process of cognitive change or learning.

Teaching

The argument is that change cannot be done for the learner. Only the individual can process that information and cause cognitive re-structuring.

There are also difficulties in the context of the classroom. Each person has a different mental structure. This is partly attributable to each person having different experiences, histories and interests. Such cognitive diversity suggests that the same provision may not connect with and serve each individual.

One way in which a tutor might support learning within this theoretical framework is to provide multiple perspectives on a given issue (Jonassen 1994). In doing so, a tutor might raise the chances that each individual might find something which resonates with their particular way of thinking. Each person might thereby more easily relate their current thinking to one of the alternative views presented by the tutor.

The social context is not the main focus in this theory but it is mentioned as important. For example, Piaget regarded cognitive development as happening in a series of age-related stages. He based this partly upon the later ability of children to adopt another perspective. This is the 'three mountains' experiment in which a child was asked to imagine the view from another side of a physical model of a hilly landscape (Piaget and Inhelder 1969). Piaget noted that only children of a certain age were capable of doing this task successfully (Piaget and Inhelder 1969; Piaget 1977).

That task is an example of a person having to relate their current view to an alternative position. It implies a form of perspective-taking. Piaget's experiment was later questioned when it was discovered that the complexity of the model impacted upon the child's ability to imagine another perspective. With a simplified environment, younger children were shown to be capable of completing the task successfully (Thompson and Fine 1999).

This suggested that a focus solely upon features of the individual would not provide a complete explanation of how learning occurs. Features of the social environment also play a part in how we learn.

Learning

Reflection is one way individuals are encouraged to develop their learning. Reflection can be broadly defined as "*a review of experiences, thoughts and feelings that lead to change in understanding or practice*" (Boud, Keogh et al. 1985).

There are many different models of reflection most seem to offer a structural view of the task. This has produced models based upon cycles (Kolb 1984), spirals (Carr and Kemmis 1986; Kemmis and McTaggart 2003) or loops (Argyris and Schön 1978). Many can be summarised as involving a variation of 'plan, do and then review.' These models recall and give structure to Dewey's original view of reflection as an *intention* to learn (Dewey 1916).

Taking this a step further, metacognition is seen as a key process in reflection (Moon 2004). This equates to a review of the way an individual may have been thinking about an issue (thinking about thinking). It is not restricted to a view of the content. Metacognition, largely seen as a process of introspection, looks at how we came to hold a particular view. It may also consider other possible perspectives.

One way in which a reflective individual might support their intention to learn is to adopt a view (a psychological ‘position’) on a given issue. This is sometimes referred to as a ‘critical stance’ (Moon 2007). Doing so can be described as a moment in which a learner might freeze or solidify their otherwise fluid life-experience in order to focus attention for learning. This might help the individual relate their thinking to alternative perspectives and support the reflective process.

Both reflection and metacognition can be seen as a review of a *stance* taken by the learner on a given matter. In order to review our thinking process, we might develop an awareness of a particular view we may have held in the past. We might relate that earlier thinking to our current perspective. That would allow us to assess the validity of our initial thinking.

We may also test that original stance against other alternative stances which might have been adopted. Such alternatives may be different views we have considered at that time or since. We might consider that earlier view against other possible stances. These alternatives might also be sourced from the literature or from elsewhere within the social realm.

Relevance to this Research

In the Shared Thinking process, participants begin by recording their own view of a given matter. We can regard this as perspective-forming. We could also see this as people taking a critical stance.

This personal perspective on the given issue is then shared with others in small groups. At the end of the process, the dialogue and interaction result in the co-production of a pie-chart on the classroom screen. The pie-chart aggregates the views of the group. It can be understood as a social or whole-group perspective.

Within this Shared Thinking process, each person may then relate their own view to that of the group as represented in the pie-chart. In this way, it involves a process of perspective-forming and perspective-taking. Each individual could be seen as developing an initial stance at the beginning of the session. That stance is then weighed against the discussion in the small group and the electronic summary of the whole-group view. As such, this theory may be helpful in seeing the Shared Thinking practice as an intentional activity that involves a comparison of different perspectives.

2.2 Social Constructivism

If Constructivism places an emphasis upon the internal mind, Social Constructivism looks to the social context. Where Constructivism placed the responsibility and agency in learning with the individual, Social Constructivism suggests that agency and responsibility for learning is at the least shared with the tutor. Vygotsky is probably the person most associated with Social Constructivism (Vygotsky 1978).

The Change Process

This theory holds on to the account of conceptual changes put forward in the above discussion of Constructivism. However, the emphasis in Social Constructivism is upon the role of others. Typically this refers to tutors, or more knowledgeable others, who facilitate internal change in the learner.

According to Vygotsky and Social Constructivism, learning happens twice. The first time it takes place outside the mind. The second time it happens inside the mind (Vygotsky 1978). As such, learning could be seen as a process of internalisation by the learner. However, this is not the complete story.

According to this theory, student learning (and possibly tutor development) takes place within a shared mental space. An inter-psychological space is generated by the meeting of two interacting minds. This is known as the zone of proximal development (Vygotsky 1978).

Within that inter-mental space, the learner and tutor interact to create a shared understanding. This shared perspective mediates between the learner and the tutor. It provides a platform for the tutor to help the learner extend their thinking beyond the level they can achieve alone.

Teaching

This theory is not a classroom practice (Crook 1996). The theory is essentially a view of a developmental relationship between two people of unequal status – the tutor and the individual learner.

Others have tried to extend this tutor-student zone into a classroom practice. Laurillard has sought to develop a class-wide view of social constructivism through the elicitation of the student view (Laurillard 2002). Elsewhere, Mercer has sought to conceptualise a collective zone of proximal development by focusing upon support for dialogue in the classroom (Mercer 2000; Mercer 2003).

In some senses, this theory is useful because it offers a way of explaining how the teaching role connects with the learning role. The tutor elicits the learner perspective and then corrects or elaborates upon that view. Laurillard regards the tutor-student relationship as the most important part of the learning process (Laurillard 2002; Laurillard 2009).

Learning

Implicit in this theory is the idea that the tutor needs to understand the learner's view. This is achieved by eliciting that view in a dialogue between tutor and student. The learner is involved in a similar relational process. The learner needs to understand the position put forward by the tutor.

Following on from the discussion of Constructivism (above), in this theory both parties are involved in perspective-taking. Both have to develop and articulate a stance and relate that to another perspective. This is a relational idea of learning.

At a given point in the process, one perspective becomes shared. At such a moment, there is common ground between them. Rather than the learner developing a stance alone, the tutor-student interaction creates a mutually understood view. The tutor is able to carry some of the cognitive load in helping to hold this in view. This is a perspective held in the minds of both tutor and learner which provides a platform for collaboration.

Teaching Relative to Learning

This theory is useful for the way it helps bridge the gap between the role of the tutor and the individual mind. Whereas Constructivism accepted that the environment played a part in our development, it was still difficult to join the external world of teaching to the internal world of the individual. Social Constructivism appears to resolve this within the tutor-student relationship.

The shared understanding achieved through discussion may be a step along in the initial understanding held by the learner. From that shared position it may be that the tutor is able to carry the learner further. Alternatively, the shared understanding may simply be a view taken by both parties that enables the tutor to align their input knowing the learner's

starting point. Either way, the shared understanding provides a stance on a given issue. It solidifies fluid experience for both parties to conduct further work together.

In this way, the distinction between Constructivism and Social Constructivism is the method by which the stance is constructed and the way a shared perspective mediates between the individual mind and the social world which includes the tutor. Constructivism suggests that the individual might organise this for themselves whereas Social Constructivism suggests that a stance is co-constructed as a bridge between two minds.

In terms of agency, Constructivism would seem to suggest that the individual is responsible for processing information and making sense of it. Social Constructivism, on the other hand, suggests that others have some agency in the learning process.

In either theoretical case, learning seems to involve the adoption or development of a stance. That stance is then related to another possible view. This is a process of perspective-forming (the stance) and perspective-taking (the relational act).

3. The Socio-cultural Level

From the previous individual level discussion, we have the suggestion that the process of learning, as an account of internal change in the individual mind, involves both perspective forming and perspective-taking. We can also suggest that the development of what I will call a 'perspective-in-common.' In social constructivism, the shared understanding is between tutor and student. This shared perspective may function as a bridge between the internal mind and the social world. It mediates between the individual mind and the social context of learning.

The discussion to this point has centred upon the tutor-student relationship in an educational setting. From here, I aim to expand upon the discussion of perspectives and

apply it to the wider social world as I explore socio-cultural ideas of learning. This will take us beyond the confines of the classroom and beyond learning understood as largely located within the individual mind.

To do this, I will review two theories. The first of these is Activity Theory and the second is Situated Learning. In both these cases, the focus of attention is as much upon the collective/cultural level as it is upon any given individual within.

3.1 Activity Theory

To date, I have discussed the individual level of learning. However, learning is not solely attributable to the embodied mind. At the very least, the culture in which our lives and activities occur informs our development. The problem has been how to accommodate these social and historical factors into our theory and practice of learning.

Activity Theory seems useful in this regard. In its original form it was based on work done by Vygotsky. In the contemporary form of this descriptive theory, Engeström is perhaps most associated with its development (Engeström 2000; Engeström 2007).

Whole-system perspective

Perhaps the most significant contribution of Activity Theory to our understanding of learning is the way it describes a view of action within a social system. This theoretical framework takes the social context of any activity as its focus.

This theory looks beyond learning as a matter for a given individual. It also sees the social and cultural context as an entity with capacity to learn from an activity. This suggests that the collective level has agency in learning.

Intentions and outcomes

Rather than taking the individual as the unit of analysis, Activity Theory is equally concerned with the cultural and collective level. Distinctions are drawn between a collective entity such as an organisation and the activity of a small group or an individual. The collective level has an orientation towards the world whereas groups and individuals have aims.

More formally in this theory, the subject is said to have an object. At the collective level, for example, an *activity system*, within the social and cultural world can be described as having an orientation within society. This is 'the object of the system.' This 'object' frames activities within the social system (Engeström 2007).

An *activity*, including learning, is driven by a goal or an intention to conduct that action. Rather than thinking of this motivation as an individual property, Activity Theory locates it within its cultural context. This is because it is framed and influenced by the wider activity system in which it resides.

In addition, any activity will have an *outcome* of some sort. That outcome may or may not be as initially intended. It may also have different outcomes for the different actors involved. Each of those actors may be individuals or groups. Each of them may have different goals but they are shaped and constrained within the wider culturally-constructed framework.

Activities are mediated

According to this theory, and following Vygotsky, activities are mediated (Vygotsky 1978). This includes documents and tools (both psychological and physical), rules and events. These can be understood as the norms for that activity system.

Activities are also mediated by other people who may be involved. These mediators may change the outcomes as they constrain some activities and enable others.

The local and wider system

According to this theory, activities are a product of the social circumstances in which they are located. Those circumstances are also the cumulative product of history, of social dialogue, and of interaction.

Any particular activity is itself positioned within a wider activity system. An example of this might be a classroom in the context of a school or the school in the context of a national educational system. These can be regarded as sub-systems within activity systems.

This theory suggests that different stakeholders (actors) will have a different perspective on the social system (Engeström 2007). So, although everyone shares an interest in ‘improving a child’s education’ the tutors may have one view, parents may have another, and politicians may have a different perspective. As such, the achievement of the overall purpose of the collective activity system will look different according to those different perspectives as sub-systems of activity. We could argue that this indicates context-sensitivity within the social and cultural system in which any given activity occurs.

Expansive Learning

In more recent writing, Engeström introduced the concept of Expansive Learning (Engeström 2007). According to this concept actors and activities do not simply play out their culturally prescribed destiny. Activity systems have agency. Each time that system is activated by activities within, it may give rise to new learning.

In this respect, Expansive Learning articulates a generative view of development across a system of activity. This may take place across the boundaries of different activity systems. As such, Expansive Learning takes a view of activity which can horizontally span different agencies or groups.

One example, quoted by Engestrom, involves different agencies implicated in the treatment of a hospital patient (Engeström 2007). This activity system can be understood as one involving nurses, doctors, physiotherapy, laboratories carrying out tests, and social workers involved in rehabilitation. Each of these professions will have its own cultural norms.

In this example, when a doctor triggers this chain of events to help a patient, each element functions as a sub-system of the over-arching hybrid activity system. The sub-systems each have their own sub-activities within the overall activity-set. The activity-set is conceptualised as a collective zone of proximal development (recalling and modifying Vygotsky).

According to the theory, new knowledge may result from this hybrid set of interacting activity systems. On each such occasion, this will be unique to those involved in that overall context. Learning, in these multi-agency examples, is described by Engestrom as a process of '*knotworking*.' This term is used to describe the complex learning environment and the process of complex task of collaboration within.

Working across different activity systems, as part of an overall activity, helps to describe how knowledge is developed in the boundary between professions. This is generated from a process of '*co-configuration*' and participation in cultural practices. In each case, the driver is the object of the collective. We could regard this as a relational view of development between different collectives.

Relevance to this research

Activity Theory provides us with a socially-contextualised view of development. It also allows us to consider individuals and sub-groups within that wider context. Rather than thinking about learning at the individual level, this theory recognises and describes how individual and small group activities are embedded within social systems. Activity Theory describes the relationship between individuals and activity systems along with the norms and conditions which influence any activity.

This research is focused upon exploring a particular learning technique. Shared Thinking is a technique that involves individuals, small groups, technology and work as a whole group. It would be possible to conceptualise the case studies in this thesis as activities within activity systems using this theoretical framework.

We can also see the Shared Thinking process as one in which there is a similar dialectical relationship between individuals and the social context. That context includes others involved and the activity is contained within the classroom as an activity system itself nested within the institution.

The Shared Thinking process also brought together knowledge from different social groups and different activities. For example, we brought together pie-charts from different groups and different sessions. This could be likened to expansive learning involving work across boundaries and activity systems. The dialogue and interaction amongst the participants, and across sessions, can be understood as ‘knotworking’ leading to new knowledge each time.

Using this theoretical framework, we could explore the tools and the technology as mediators of learning. We could also explore the goals of the session. For instance, it might be to reflect together as a group on assessment practice. Each participant may have an individual goal/object. The outcome for each individual is partly determined by the

situational factors and partly determined by the interaction that mediates each person's understanding.

For instance, one individual may seek to understand the collective view whilst another may seek to validate their personal approach. We could look at each stakeholder as having a different aim in the same process. Each could equally have a different outcome from the same activity.

It would be possible to research this by conducting interviews to better understand the outcomes of these activities. This could be done for each individual and as a group. These different individual perspectives on the activity system would provide an overall insight into the activity system (the Shared Thinking process as well as the educational context). Whilst doing so, we could also look at the role and impact of the tools and their impact on the activities.

In this respect, Activity Theory would seem useful for this research. It could take us beyond the idea of the individual as the unit of analysis. It would allow the research to become an inquiry into the session as an activity system. It might also provide a useful description of how the new technique worked as a whole.

My personal view is that Activity Theory can make a significant contribution to the view we have of the Shared Thinking process. Perhaps most importantly, it illustrates the dialectical relationship between individual learning activities and the social context. It also highlights the role of the norms and situational conditions within the process as an activity system.

3.2 Situated Learning and Communities of Practice

This theory is another way of looking beyond the individual mind as the location of learning. In considering this theory, we look at individual learning in relation to the cultural level. This theory is useful for trying to understand the development of an individual within a given social or professional community.

Jean Lave and Etienne Wenger are seen as the main proponents of this theory (Lave and Wenger 1991; Wenger 1998; Wenger 2007). Others have also been influential in the way this theory has developed over time (Brown, Collins et al. 1989; McLellan 1994; Cobb and Bowers 1999).

Social Context as a Perceptual Field

Perhaps the most important point to say at the outset is that the idea of learning as situated should not be understood as literally situated in a physical location. Learning is said to be situated within a psychological perception of the social context. It is not about being located within the physical environment (Clancey 1995).

This connects with points raised above in the individual level discussion. This notion of situated learning can again be seen as a psychological process of perspective-formation and perspective-taking. In this theory, learning is perceptually situated within a communal role. Such perspectives are generated as the individual acts in different settings. These are referred to as 'landscapes of practice' (Wenger 1998; Wenger 2010).

In this way, the social context is a momentary, psychological and perceptual view of a community. This is important because such ideas of learning take us beyond the individual mind. It is not restricted to the classroom and it connects individual learning with the social world.

Learning as Participation

According to this theory, through experience and dialogue within the community, the situated perspective becomes more developed. Theoretically, this enables greater participation in the life of the community (Wenger 1998; Wenger 2007). In this way, the individual's perceptual field will constrain or mediate the ability to function as a member of that community.

People here are said to *participate* in the community and to learn through that participatory process. That participation, in the practices of the community is influenced by the use of tools, discussions with others, and by the situational constraints. This is also shaped by the situated view held by the individual of their role. This situated perspective partly determines the selection of available tools and the form given to their practice.

According to this theory, learning is seen as a process of participation in which the individual slowly understands how to be and how to talk in their communal role. In this respect they slowly *become* a person that belongs to the community (Lave and Wenger 1991; Wenger 1998). This relates to the identity of the individual and who they are as a participant within that notional community.

The Culture of a Community of Practice

In this theory, the community itself, as a social and cultural construct, also has a set of norms. These are the artefacts, the tools, documents and objects of that particular world. Such norms also refer to the ways those objects are used in the social routines that make up the communal role held by a given individual. That individual understanding acts as a mediator between the local context and the global context of the community.

The individual can never know the whole community. They can only understand their role and then largely within their personal and social context (Lave and Wenger 1991; Wenger 1998). The depth of the perception held by a given individual and the capacity of that individual to develop their situated view will organise their participation and constrain their perceptual development.

Relational Learning

According to this theory, the community can be seen as the curriculum for the practitioner. Through participation, the individual adds detail to their perceptual understanding. They come to *see* more when they think and act in their community-role. This is sometimes discussed as a cognitive apprenticeship (Brown, Duguid and Collins).

In this respect, we are able to describe the mind's perceptual development in relation to the community. In this theoretical view, the individual mind and the socio-cultural world interact in a social context, mediated by the perceptual field of the individual in their community role. The community effectively defines what the individual mind must comprehend. Through participation the individual's view is formed as a way of seeing and then acting in local 'landscapes of practice' (Wenger 2010)

In this theory, the mind is seen as structured by participation. The social world is said to organise cognition through its norms. These social shapes are said to be reflected internally for each member. Internal differences are accounted for in the diversity of practices, situational constraints and the level of importance one community has in relation to another.

Identity

According to this theory, the sense of identity is developed in a cumulative manner by the individual. This arises from participation in the community of practice. The individual is seen as being in a process of becoming a member of the community.

In this respect, the theory talks about *knowledgeability* and accountability (Wenger 2010). Knowledgeability refers to the individual capacity to function and participate in their communal role. This influences and describes their identity development.

The social context of the role in the community context is partly described in terms of the demands made by other stakeholders. These are described as different aspects of accountability (Wenger 1998; Wenger 2007). In this theory, there is vertical and horizontal accountability. Vertical refers to those in authority while horizontal refers to peers.

In these different ways, identity is seen as a cumulative process of extended engagement within a community. The individual negotiates and navigates their way in the world through dialogue and participation. This develops the knowledgeability of the individual practitioner and deepens their relationship with the community. This is seen as largely self-governing interaction (Wenger 2010).

In this respect, identity is seen as a central part of this theory. Taking this a stage further, each time a person might change location, from the home to the office for example, a person may need to change identities. This is discussed as the *reconciliation* of identity in different locations (Wenger 1998).

Navigating these boundaries of identity is seen as a challenge for each person. These boundaries are often blurred as conversations in one place run into another elsewhere. This has echoes of knotworking in Activity Theory.

Identity, in this theory, is discussed as an individual process of self-realisation as they become a member of a domain shared by others. That domain has its own identity to which the individual commits themselves through participation.

This suggests that the individual navigates across many different communities as they develop their hybrid identity. We have a cumulative sense of individual identity in which the community facilitates admission or inhibits participation. Individuals make choices and have agency. Communities exert influence by making individuals accountable to peers and figures of authority. This is an account of a relationship of the individual with the social world. Identity is central and seen as the consequence of an individual movement across different communities.

Relevance of Theory to this Research

We can see Shared Thinking as a process that allows individuals to participate in the classroom as a community of practice. Participants are also in a cognitive apprenticeship relative to the discipline community.

The Shared Thinking process can also be seen to broaden their *knowledgeability* as a community member. Their initial perception of the social context might be broadened and informed by the dialogue, interaction and whole-group view.

The notion of identity may also seem useful. The literature on classroom technologies mentions the infusion of identity generated by the re-configuration of the classroom and its members (Hegedus and Penuel 2008).

The Shared Thinking technique may also be said to organise a sense of group membership as a form of ad-hoc identity. As such this theory, and its view of becoming a community member, may be a feature worth considering.

In this process, each individual is in a dialectical relationship with the classroom community mediated by their initial perceptions. The classroom might be considered as a community of practice in which the individual student is positioned as a *peripheral participant* within the institutional context. For all these reasons, this theory may have some value for this research.

4. Identity Level

At the individual level, I discussed the role of perspective-forming and perspective-taking. I discussed the agency of the individual and of others in the learning process. At the socio-cultural level, I discussed a social and structural idea of learning beyond the individual mind.

I explored Activity Theory for the way it described learning in its social context. Activities were seen as the catalyst for understanding the activated framework of actors and mediating tools. That theory also showed the idea of working across boundaries (*knotworking*) and the possibility of new knowledge and agency at the collective level.

I then discussed Situated Learning and Communities of Practice which also extended the discussion beyond the individual mind. Participation was seen as a way of learning. This was facilitated by the perceptual field of the individual in their communal role. The situated view functioned as the bridge between individual development and the social world. This, in turn, resulted in the development of individual identity.

At the beginning of this chapter, I discussed two themes. They were engagement and belonging. I suggested that these themes corresponded quite closely with ideas to do with social identity. The review of learning theories also suggested that identity is central in Situated Learning. I also want to locate a view of identity that takes collective level agency into account. This would recognise some of the ideas of Activity Theory.

My belief is that identity may indeed be central to development (as per Situated Learning) such that it warrants deeper consideration of its possible role in learning. I think that we need a more sophisticated view of identity that takes into account the relationship amongst those sharing a given identity. Here we also need to understand groups (the collective level of agency as per Activity Theory) and their psychological influence upon individuals. With this in mind, I discuss Social Identity Theory in the next section.

4.1 Social Identity Theory

This theory comes from social psychology. In order to discuss this theory, we first need to distinguish between personal and social identities. Then we need to understand more about social identities. This should help us to understand their possible role in learning using the Shared Thinking practice. The two themes above, engagement and belonging appear to be a feature of this practice that also corresponds with the ideas in this theory.

Personal identities could be considered as the set of social identities that constitute our individuality. Alternatively, we could suggest that our personal identity is all the things that make us unique when compared to others. Perhaps most importantly, we can say that personal identities are embodied. The boundary of our personal identity is in the main determined by our mind and our physical body. For the purpose of this research we will take this last point as our working definition of personal identity.

Social identities, on the other hand, are distinct from personal identities because they are shared with others. Social identities include race, gender, ethnicity and religion. However, there are thousands of social identities. Social identities go far beyond the individual mind to be shared by others. They are the sense of who we are as members of a group.

Social identities are also context-sensitive in two important ways. They are context-sensitive at the level of the individual. If each of us has the same social identity in our

profile, the significance of that identity will be different for each person having that identity.

Secondly, social identities are context-sensitive at the situational level. Factors in the social environment, our perceptions of that context (recalling Situated Learning), will partly determine whether a social identity is activated or not. The activation of a particular social identity may be the convergence of our internal set of social shared identities with the perception of which of our identities is currently salient within the immediate social setting (Steele 1997).

Social identity theory describes the way we are influenced by our membership of social groups (Tajfel 1969; Tajfel and et al. 1972; Tajfel 1974). Identity here is not regarded as solely an attribute of the individual. In this theory, identity is not seen as static or a stable entity developing in a cumulative self-determined manner (as implied in Situated Learning). Here, it is modified in response to activation each time (recalling Activity Theory). Compared with socio-cultural accounts, this theory has a much more fluid view of identity (Turner, Oakes et al. 1994).

According to Social Identity Theory, our identity will, at any given moment, be located along a continuum. At one end of that continuum, an individual will regard themselves as distinct from any group. At that moment, they will see themselves as an individual (this is who I am).

At the other end of the continuum, the individual sees themselves as a member of a group. We are each likely to belong to many different groups. At that moment, the person will see themselves as a group member like any other. They are said to de-personalise and become representative of the activated group (this is who we are).

When we see ourselves as a member of the group, we favour our group over another. We also dis-favour other groups, at the same time. This is a form of social prejudice. We see

ourselves as members of an ingroup. Those outside are members of an out-group. This is called ingroup bias (Tajfel 1974).

We may be able to break down the boundaries between groups by re-categorizing the immediate situation in the minds of those involved. This is done by developing, or switching to, a different social identity. This would be one that all members had in common. This is called the creation of a '*common ingroup identity*' (Gaertner and Dovidio 2000; Dovidio, Gaertner et al. 2007; Gaertner and Dovidio 2011).

When we identify with a given group then our understanding and response to that situation is likely to be determined by our perceptions of being a member of that group (Hornsey and Hogg 2000). Social identity theory suggests that we align ourselves to our perception of the social norms for that group (Stets and Burke 2000; Haslam, Reicher et al. 2011). Norms are the social and cultural practices, rules and routines associated with a given group.

In this sense, a group is not a passive context (Haslam, Eggins et al. 2003; Haslam 2004). It is a source of social influence. Theoretically, some have argued that there are different kinds of social influence. Identification gives rise to both cognitive and affective alignment.

Relevance of this theory to the research

Interestingly, in the context of this research, a shared group identity is a facilitator of perspective-taking (Batson, Early et al. 1997). The suggestion is therefore that the process of alignment to social norms is an act of perspective-taking in which we relate our view as an individual to that of the group.

Might this explain how learning might work in the Shared Thinking process? Might it also suggest that learning in this process is an act of relating our thoughts to those of a group? Could this be a process initiated by social identification rather than seeing identity as an outcome of participation?

In the Shared Thinking technique, we could argue that the pie-charts, generated as an outcome of dialogue and interaction, serve as group-specific social norms. These are the norms for an ad-hoc social identity.

By externalising this shared understanding, and making it visible, we have a view of the group in the individual rather than the individual in groups. If the group identity, including its social norms, is a mediator for individual thought and behaviour then we might focus upon the group in order to understand how each individual is thinking and feeling.

Theoretically, if each participant is mindful of the same social-identity i.e. membership of the class-group, then each person will align to the group-specific norms (Livingstone, Haslam et al. 2011). The Shared Thinking process could therefore be seen as an attempt to induce a process of self-categorisation for each individual to see themselves as a member of the classroom-group.

We might therefore aim to develop a sense of identification with the group, make their situated norms visible which may then cause psychological alignment (Terry and Hogg 1996; Neighbors, LaBrie et al. 2010). In plain English, we would do that to cause individuals to relate their thinking to that of the group.

Through social-identification will be more likely to prompt 'engagement' with the display of the voting results. If we can achieve this then we might expect both cognitive and affective engagement (Turner 1975; Turner, Oakes et al. 1994; Turner and Krechevsky 2003; Bizumic, Reynolds et al. 2009). This means that we would expect empathy as part of the outcomes.

The suggestion is that socio-cultural accounts of identity see ‘individuals in groups’ (Turner 1975). This means that we have a sense of an individual developing a sense of who they are as the accumulation of experiences across different social settings. For research, the assumption might be that we should look at the individual to understand identity.

In contrast, Social Identity Theory (SIT) considers groups in individuals (Turner 1975). This means that our sense of who we are is at least partly made up of the groups to which we belong. In research terms, instead of looking at individuals for a window on their thinking we should also look at the groups to which they belong.

If groups are mediators of individual and cultural thought then we should equally focus on the group as reflective of *each* individual’s thought. This is because these groups are also a source of influence when individuals see them as significant and identify with them.

To achieve this, we must first develop a shared sense of group identity. If it was true that the Shared Thinking process is one that generates a shared sense of identity then the resulting pie-charts may reflect the way individuals think about the given issue.

Either way, this review of identity takes account of the collective agency hinted at in Activity Theory. In addition, it takes account of the situated perspective of the individual in Situated Learning. This is placed in a relationship to the group-situated perspective visualised in the Shared Thinking process. This gives us a more sophisticated view of identity compared to that presented in situated learning with both individual and social identities being context-sensitive.

5. Discussion

In this chapter, I have considered three different levels of learning. They are:

- The Individual
- The Socio-cultural
- The Social Identity

I began this chapter with an individual view of learning. This became a discussion of perspective forming and perspective-taking. A shared understanding was the mediator between tutor and student. I went from there to a socio-cultural view of learning in which the social context of learning became the focus. That suggested that agency could reside at the collective level.

From there, I discussed situated learning as a psychological perspective which mediated between the individual and the community. Identity was seen as central to that theory but that was expressed as a cumulative development process as the individual went from one place to another. It was an individual's psychological perspective on a social role.

I looked for a different theory of identity that took account of agency at the collective level (as per Activity Theory). I also wanted a theory that recognised others as also sharing that identity. Rather than seeing a psychological perception of the social context, I wanted to know what all those within the community held as their referent. I wanted to connect the psychological perspectives of all those with a given role. This was in order to take account of the social context. To look at an individual perspective of the communal role seems to miss the socially constructed role in society. That communal role is the coordinator of individual activity and understanding.

Social Identity theory seemed useful as a context-sensitive view of group influence. Social identification appears to prompt individuals to relate their perspective to that of the group in a process of alignment. The shared understanding is a way of describing the social

norms for the group. That understanding mediates between each group member. Those social norms are a psychological reference point for each person occupying a given social role (lawyer, doctor, student etc.).

This seems to be appropriate as a possible explanation of what might happen in the Shared Thinking process. Based on this theory, it seems that social identities may be a vehicle for linking each individual mind with the social context. Identification may be the trigger for this relational link to be activated.

This research will therefore consider the idea of *group work* in the classroom as both structural and psychological. Holding on to the idea of Social Identity theory as a possible theoretical explanation of Shared Thinking, the following chapter will turn to address some of the structural aspects of group learning.

Chapter 3: Literature Review – Group Learning and Technology

1. Introduction

In the opening chapter of this thesis, I looked at the idea of learning as the development and exchange of different perspectives. In the second chapter I took a theoretical view of group learning highlighting the relationship between individual and sociocultural theories of development. In this chapter, I will address the structural side of group-learning with technology. Doing this, should help an investigation into the psychological and structural side of Shared Thinking as a group-learning pedagogy.

The current chapter explores the literature on group learning with technology. I begin this chapter with a review of general features of group-learning. In the second part of this chapter, I will provide examples from the literature which illustrate some of the key ideas which informed the development of the Shared Thinking practice. This will also be mindful of the role of technology in group-work. These examples are:

1. Charles Crook's work on mediation and technology in the classroom (Crook 1996; Crook 1998)
2. The Making Learning Visible Project and the role of documentation for whole-class communication and widening access (Ritchhart and Perkins 2008; Krechevsky, Rivard et al. 2010)
3. David McConnell's and colleagues' work on Networked Learning Communities and the idea of technology to provide a space for collaboration and sharing (Lally, McConnell et al. 1999; Bowskill, Foster et al. 2000; Foster, Bowskill et al. 2000; McConnell 2000; Lally, McConnell et al. 2001; Goodyear, Banks et al. 2004; McConnell 2006; Banks, McConnell et al. 2008)
4. Walter Stroup and colleagues' work on whole-group inquiry in the classroom supported by technology (Stroup 2002; Stroup, Ares et al. 2004; Stroup 2005; Stroup, Ares et al. 2005; Stroup, Ares et al. 2007; Carmona and Dominguez 2008; Ares, Stroup et al. 2009)

2. Group Learning

In this part of the chapter, I want to explore some of the defining features and characteristics of group learning. Here I am painting a general picture of the main features and benefits of group learning. This does not focus specifically on technology.

My goal is to highlight the interdependent relationship between individuals and the group. I argue that group learning and development is typically seen as something quite static. Groups and people are too often seen as having fixed characteristics. Development in such contexts risks appearing like an orderly and sequential journey from one stage to the next.

In this thesis I dispute such a view. I am seeking to develop a situational and relational view of development. This viewpoint approaches the notion of development as context-sensitive for each individual in the group and for each group. The theoretical perspective suggests that individuals have different histories, interests and identities. At any moment, an individual may be thinking independently or as a group member. When we think as a group member we take on the social norms of that group in the way we think and behave.

This may be one explanation of why people in the same class may be thinking about different things or at the same situation in different ways. The task becomes one of getting everyone to identify with the current group on a topic relevant to the group.

2.1 What is a Group?

A group is not defined by the numbers involved. If that was the case then any passers-by on the street would constitute a group. For our purposes, a group is more than a mere *collection* of people (Jaques 1984; Jaques 2003). Listed below are eight defining characteristics of a group (Jaques 1984):

- *Collective perception*: members are collectively conscious of their existence as a group
- *Needs*: members join a group because they believe it will satisfy some needs or give them some rewards.
- *Shared aims*: members hold common aims or ideals to which to some extent bind them together. The achievement of aims is presumably one of the rewards.
- *Interdependence*: members are interdependent in as much as they are affected by and respond to any event that affects any of the group's members.
- *Social organisation*: a group can be seen as a social unit with norms, roles, statuses, power and emotional relationships
- *Interaction*: members influence and respond to each other in the process of communicating, whether they are face-to-face or otherwise deployed. The sense of group exists even when the members are not collected in the same place.
- *Cohesiveness*: members want to remain in the group, to contribute to its wellbeing and aims, and to join in its activities.
- *Membership*: two or more people interacting for longer than a few minutes constitute a group.

The list above provides a rich picture of a group. We have a sense of the individuals and of the whole-group. One thing Jacques may have missed out here is the way this detailing also provides a sense of that which constitutes the shared sense of identity for a group. This omission is important in this thesis because it marks out the distinction between learning design as an instrumentalist issue and a psychological view of groups. I return to this point at the end of this chapter and throughout the remainder of the thesis thereafter.

2.2 Why Groups in Learning?

There are many benefits to be had by working in groups. For example, groups can provide emotional, social and educational opportunities (Newble and Cannon 2001). A group may offer trust and safety which facilitates disclosure and discussion amongst peers (Urquhart 2005).

Groups offer the possibility of providing each participant with more ideas, a richer variety of ideas, and ideas that are psychologically closer than those from beyond the classroom. This is certainly true when compared to studying alone (Ellington, Percival et al. 1993). Working in groups also provides students with experience of working collaboratively for learning purposes. In that sense, the opportunity may help to develop group skills (Crosby 1996). These benefits may also be less available in a tutor-led or didactic model of learning and teaching (Urquhart 2005).

There are also a variety of disadvantages and pitfalls working in groups. McConnell provides a useful discussion of some of these issues (McConnell 2006). I will mention just some to illustrate. These should not be overlooked. These include disruptive individuals, lack of progress within a group, and anxiety as a consequence of being in a group learning situation. Issues of trust and group tyranny are also phenomenon related to learning in some groups.

Despite this, there is potential to learn in groups and also to draw emotional support working that way. Nonetheless, the features listed above offer a structural view of group learning rather than a psychological account of how individual learning happens. In addition, the psychological influence of others in the group upon the individual is not apparent.

Following on from this, we have the idea that a notional individual might develop skills for working with others through the introduction of group-learning. Implicitly, those

individual skills can be improved through practice. This does tend to overlook the context-sensitivity and variability of groups in both their composition and focus. This results in a view of group work determined by individual attributes free of contextual factors.

There may be many times when the behaviour, attitudes and knowledge held by others will also determine what is situationally possible. This may be true for the better or for the worse. Individual 'skills' may therefore be compromised or elaborated in the group interaction.

My point is that the literature discussed above often leaves us with an abstract idea of individuals developing generic personal skills as a way of improving collaboration. I will explore the idea that this is an impoverished view of individual development and also a weak view of group learning.

3. Groups as a Learning Environment

The review of social constructivist theory in the previous chapter highlighted Vygotsky's zone of proximal development (Vygotsky 1978) as an inter-psychological space in which a tutor and a learner develop a shared understanding between them as a basis for negotiation. Mercer and colleagues developed the inter-psychological context into a dialogical space for the support of discussion in small-groups (Mercer 2000; Fernandez, Wegerif et al. 2001; Mercer 2003).

I would agree with the idea presented by others that a group can function as a learning environment (Thelen 1981; Krechevsky and Stork 2000; Urquhart 2005). We can even envisage the inter-psychological space as one in which the whole-class of students is engaged in a dialectical search for meaning (Thelen 1981).

In Chapter Two, I discussed Social Constructivism which as a theory of learning proposes that a tutor tunes into the way an issue is understood by a learner. The establishment of a shared understanding serves as a basis for the interaction and development that might follow. This is called the Zone of Proximal Development – the extent of the development possible with the help of others.

In that same chapter I also discussed Social Identity theory which is a theory of group influence (as well as group difference). When we identify with a group we are said to align our thoughts and behaviour to that of the group (Livingstone, Haslam et al. 2011). Those group specific thoughts and behaviours are the social norms for a particular group.

This is also a form of shared understanding that influences each member of the group when they are mindful of their group membership. In this respect the group identity, when engaged, is an inter-psychological environment in which shared social categories are interpreted in the individual mind.

This is also a group environment that does not depend upon the presence of others to be activated. As an example, we might be mindful of our favourite football team when we are alone. At that moment, we may think and behave as a football fan because we identify with that particular social identity. We might describe this as a group minded environment.

Seeing this as a particular group environment leads us to the issue of how we may use that in the classroom for the purpose of learning (the work of this thesis). The task would appear to be for the tutor to get each person to engage with the same topic and recall their knowledge for that issue. If each person is mindful of belonging to the group then the theory goes that they will relate to the norms for that group. Therefore by making the thoughts visible they should be likely to relate their own perspective to that of the group on that particular topic.

People are more likely to identify with a group when they are with members of the group than when they are away from the group. Dialogue is another way of increasing the likelihood of identification with the group (Livingstone, Haslam et al. 2011). I think it is reasonable to speculate that if we add the visualisation of the discussion to the mix then there is an even greater likelihood that identification with the group will be stronger still.

Hence, the task for the tutor can be seen as one of orchestrating interaction in order to generate a sense of shared identity that leads to the production of norms which are specific to that particular group. In that way identification should lead to engagement because the participants will be more likely to be mindful of the same social identity.

The further task for the tutor can be seen as the curation and management of social identity in the classroom. This means supporting the group to generate different norms in order to elaborate a particular issue. The tutor is organising the selection of the given group as the salient social identity for each participant in the classroom.

Working collectively, I am proposing a view of a classroom in which different parties are asking the question “What do we, as a class of students, know about this topic?” in a spirit of whole-group inquiry. This is a move away from thinking about students as recipients of imported knowledge from beyond the classroom (Krechevsky and Stork 2000).

I believe that we could think of a whole-class (and the individuals within) as collective creators of their own theories and of their own learning agenda (McConnell 2000; McConnell 2006). These co-generated norms move us from the idea of student generated material to group generated content (collective biographies).

4. Group Knowledge

It can be difficult to understand and research that which is known by a particular group. This is made more complex if its membership changes. Even the most constant membership will need to take account of different contexts and issues evolving over time.

Despite this, we can think about groups as having knowledge (Kilgore 1999). In concrete terms, a group may have the ability to generate a product even when it is beyond the ability of any member to do the same. In terms of social identity a group has norms which are the beliefs, values and practices that define the group to its members and to others outside the group. These norms evolve and can be regarded as knowledge pertaining to a group. Others have noted the situational nature of any shared view (Brown, Collins et al. 1989).

Dillenbourg is useful in his discussion of collaborative learning and shared understanding. He seems to consider shared understanding as an outcome of collaboration:

“Shared understanding can be viewed as an effect, if the goal is really that a group builds the common grounds necessary to perform well together in the future. Shared understanding can be viewed as a process by which peers perform conceptual change. Shared understanding can be viewed as a condition for conducting effective verbal interactions.”(Dillenbourg 1999).

Although I feel that a shared understanding could indeed be an outcome of classroom interaction I also feel that this suggests consensus. To my mind this need not be always necessary. I am suggesting a view of a shared understanding as a representative way of thinking about an issue relevant to the group. This is a conceptual representation only some of which may be salient to certain members. I am promoting an idea of shared thinking as much as shared understanding. The difference between is suggested in order to distinguish between agreement and illumination of a group related topic.

In this thesis, I aim to develop a view of shared understanding based upon diversity of thought within the group. We could see this as a form of brain-storming that generates emotional as well as cognitive affects. By this, I mean to base the notion of an understanding at the level of a social schema (a mental structure). This is an elaborated view of Vygotsky's notion of a shared understanding. This is no longer an identical picture held in both minds. I am promoting the idea of co-construction of the conceptual landscape that allows each participant to respond according to their own interests and motives.

The idea I am seeking to develop is the sense of a Zone of Proximal Development that relates to the social norms for a particular group. Those norms are engaged once the social identity is activated in the mind of each participant. In this respect any sense of a Zone of Proximal Development is a collective issue in which each participant may be moved beyond a stage achievable alone. This is context-sensitive at the level of each individual as well as for the group as a whole.

5. Group Development

I have painted a picture of group knowledge based around social identity. This is the notion that groups have norms that develop over time and through interaction. This is a particular way we might think about group knowledge. Group development becomes a task which involves the development of group specific views on a group relevant topic. The purpose is externalising a collective view that may serve as a resource for all concerned.

The literature contains a variety of different but rather familiar models and theories of group development. The model put forward by Tuckman is perhaps one of those more regularly discussed in the literature (Tuckman 1965). In that model we see 4 stages of group development. These stages are forming, norming, storming and performing. In a similar vein, Stage Theory (Soliman 1999) also offers a variation on Tuckman again with 4 stages. In this case, the 4 stages are orientation, transition, working and ending.

Without going into the finer points of each of these models I would argue that they are representative of a particular way of thinking – an epistemology – that sees development of groups in terms of stages or linear phases. Development in such cases also relates to individuals in groups rather than to the development of a group view.

In this way, group development becomes a much richer concept. It is a process of whole-group inquiry that asks the question: “what does this group know?” The answer – expressed as a socially situated schema - serves a variety of purposes for each group member. The class has knowledge and a co-authors view on various issues that arise from the concerns and interests of its members.

More importantly, it has agency – the power to act - in its development. These ideas are endorsed by Kilgore in her theory of Collective Learning in which groups are seen as constructors of situated-knowledge (Kilgore 1999). This theory also highlights the reciprocal influences in terms of identity development in the relationship between individuals and collectives. Through interaction each has an effect, one upon the other (Cobb and Yankel 1996; Cobb, Stephan et al. 2001; Alexander 2005).

Collective Learning theory also seeks to understand the complexity of difference within groups and to avoid a reductionist view of groups. The richness of groups is also recognised elsewhere by Wells who notes that “*the potential for collective development is only limited when the diversity of individuals and interaction with other groups is limited*”(Wells 1996). The potential for reductionism is addressed through the goal of illuminating the diversity of perspectives that exist within a group.

This point about the diversity within a classroom (for example) is important. The diversity of views, experiences and feelings are an important resource in this view of groups that learn. These are not resources to be simply aligned to the tutor’s view. They are to be understood as drivers to inform individual and collective development. These resources may then inform the development of a co-constructed learning agenda.

This is in stark contrast with the idea of group learning as the development of consensus which has been recognised as potentially oppressive (Trimbur 1989; Bruffee 1993; Hodgson and Reynolds 2005; Lawless 2008). It is also in contrast to the idea of group development navigation across different stages. Such a view is one concerned with learning a process rather than being related to knowledge development.

6. Problems of Group Learning

I am conscious of having presented a positive view of group learning based upon social identity theory. This is still a discussion of group-learning and it is important to balance this with a critique. This may help to highlight some of the issues that may potentially develop as a consequence of working in groups.

One useful summary of the challenges presented in small group work is provided below (Ellington, Percival et al. 1993):

- Absence of or lack of adequate coordination/organisation;
- Unequal participation, ranging from over-domination by one or more individuals to partial or complete opting out/withdrawal;
- Harmful effects of differing status, over-exercise of power, formation of cliques, and pressure by sub-groups;
- Pressures (external and internal) to conform or polarise;
- Absence of a systematic approach to the work;
- Unsound/ambiguous/changing decision-making procedures;
- Premature evaluation of outcomes

Many of these problems arise from the structure in a given pedagogical design. This includes things like the preparation of students for group learning, the depth of discussion and the amount of time given to discussing issues (Cohen 1994). It includes things like the numbers of participants in small groups and the way they are seated in the room (Newble and Cannon 2001).

Working as a learning community in the classroom requires structure and management from tutors. It requires a similar shift in disposition from those participating. This also involves the challenge of connecting the knowledge of small groups to each other in order to create a larger picture.

The idea of using the ideas of the learners as the basis for working as a whole-class generates a different disposition from one in which learners are enslaved to the tutor's mind (Ritchhart and Perkins 2000; Profetto-McGrath 2003). These dispositional factors are an additional challenge. These need to be addressed at both small group and whole-class levels.

Similarly, the use of generative principles, a way of learning based on student generated materials, for guiding design and interaction offers new ways of thinking about classrooms particularly where this is supported by technology (Stroup 2002; Stroup, Ares et al. 2004; Stroup, Ares et al. 2005; Stroup, Ares et al. 2007; Carmona and Dominguez 2008). Even so, this requires careful consideration of the practicalities including the management of the transitions between small group and whole-class work.

7. Group Learning Methods

There is a danger that groups learn new structures as the content for interaction. This might involve learning based on roles, as one example. This is potentially wasteful. Groups are faced with issues of common interest or concern. These issues should be the focus of group interaction.

Despite this, some structure is necessary and often helpful. Structure is particularly important when we look at sessions which involve small groups and plenary activity. Such sessions, involving transitions in and out of sub-groups, can become complex in terms of management and productivity.

At the start of this thesis, I was in search of a technique that would support whole-class interaction and enquiry. Provided below is a list of popular group methods (Crosby 1996).

- The Tutorial
- The Seminar
- Snowballing
- Free-Discussion Group
- Problem Based Learning
- Brainstorming
- Role Play
- Games and Simulations
- Clinical Teaching

In the search for a strategy that would support both small group and whole-group interaction I discovered the snowball group discussion technique. In the next section, I explore this particular technique in more detail as the one most relevant to this thesis.

7.1 The Snowball Group Discussion Technique

The snowball technique begins with an individual and works up into small groups before reaching the whole group level. The origin of this technique is credited to James Wisdom then of London Guildhall University (Wisdom 1991). Wisdom is recorded as having used an approach he called ‘The Student Consultation Method’ at the UK Geoscience Symposium in 1998. This technique or one remarkably similar has become recognised as Pyramid Evaluation or the Snowball group-discussion technique.

Wisdom suggests that the time required for this activity was 1.25 hours. He also suggested that 1.5 hours was probably more comfortable. Most of the case studies reported in this thesis are nearer 2 hours. The initial reason was so that it offered enough space for dialogue whilst fitting into existing time slots. This duration was also considered so as to allow for the introduction of the technology and for the extended dialogue and interaction

facilitated by the adoption of the technology. The use of technology was not a feature of any other reported use of this technique found in the literature.

Wisdom also made a comment about the facilitation of sessions using this discussion technique. He said that in order to maintain confidentiality the session should be facilitated by someone not directly involved in the course. Confidentiality is important if participants are going to feel comfortable disclosing feelings and thoughts. Facilitation is important but I suggest this is one indication of a possible use for electronic voting systems in the way it makes anonymous the input from participants.

The choice of the snowball discussion technique was not a formal and conscious decision. This is only retrospectively identified as being similar to a snowball technique. The design decisions were actually taken based on the issues being addressed in the first case. They were the need for greater time to be spent reflecting on their learning the need to value the views of their peers as a resource for their learning.

7.2 Positive Features of the Snowball Group Discussion Technique

The literature reveals 3 particular aspects of this technique that distinguish it from other ways of organizing group discussion. They are (Newble and Cannon 2001):

- Doesn't depend on prior student preparation for success
- The initial individual work brings everyone to the roughly the same level before discussion begins
- It ensures everyone participates at least at the preliminary stages

Elsewhere, others note that the technique is '*amazingly effective*' for ensuring comprehensive participation (Jaques 1984; Jaques 2003). This author goes on to say that this is particularly true where individuals begin by writing their ideas prior to sharing them. From this we can see broad agreement between Newble & Cannon and Jaques.

Jaques goes on to note that the snowball technique is useful for the '*evolution of well integrated ideas*' (Jaques 1984) and that it is a technique that can generate '*full and lively participation*' in the plenary discussion. Based on these writers, the snowball group discussion technique appears suited to the production of a generative discussion in a process of whole-group enquiry.

7.3 Negative Aspects of the Snowball Discussion Technique

From the literature we can identify at least 3 potential problems in the adoption of a snowball discussion technique. They are:

- The amount of time required to run this activity (Jaques 1984)
- The potential for the session to feel disjointed and frenetic (Brookfield 2006)
- The risk of breaking up the cohesive feeling in some groups (Jaques 1984)

It is my belief that the issue over the amount of time this activity requires is one that depends upon how central it is in the overall learning process. If the use of the technique is used to support whole-group enquiry and collaborative reflection then it is less of a problem to use all of a session together for this approach. If on the other hand we see this as an adjunct to learning other content or if it is one of a variety of activities planned then this could be more of a burden. Groupthink is also a possibility when using brainstorming techniques (Haslam 2004).

The use of technology to support dialogue and interaction may be one way of overcoming the potential for the activity to feel disjointed. In the third case study within this thesis (see Chapter 7), we used this technique with more than 250 students in one room. The use of technology in the Shared Thinking approach seeks to help bring the discussion together and to visualise a summary of the dialogue. If this works it should also address problems of disjointedness and any possible lack of cohesion. All the case studies were intended to fit into existing timetables so that no special changes to existing schedules would be required.

8. Examples of Relevant Practice

This thesis is an investigation into a kind of group learning that is social, relational and situational. In Chapter One I described the Shared Thinking technique. This is a particular form of group learning that combines the use of a snowball group discussion technique with the use of electronic voting systems. This core process is:

- Individuals write their own view.
- Those individuals take their view into a small group situation.
- The group decides on one choice to be shared with the whole class.
- Each group's choice is entered on the screen as one of several possible 'answers.'
- Each individual votes for the issue they regard as most important.
- The voting generates a bar chart or similar representation of the discussion.
- A plenary follows

The underlying principle is that we shed more light on the given issue by bringing ideas together and showing the diversity of thought on that matter than we do by seeking consensus. This is a way of developing the capacity to learn by drawing upon the social capital. I refer to this as a psychosocial learning design based on related ideas in the social work literature (Laverack and Lanbonte 2000; Miller, Grabelsky et al. 2010).

It is the contradictions between different views, when juxtaposed, which offers those involved an explanatory view of the issue (Pelling, High et al. 2008). Again, this is distinct from a search for an answer that corresponds to the tutor's view (as useful though that may be)

In this section, four examples are discussed from the literature. These examples will serve as miniature case studies or vignettes. Each relates to the application of technology to collaborative learning. They are:

1. Charles Crook's work on Collaborative Learning (Crook 1996; Crook 1998)
2. The Making Learning Visible (MLV) Project at Harvard.
3. Walter Stroup's and colleagues' work on network-mediated enquiry in the classroom for Maths & Physics (Stroup 2002; Stroup, Ares et al. 2004; Stroup 2005; Stroup, Ares et al. 2005; Stroup, Ares et al. 2007; Carmona and Dominguez 2008; Ares, Stroup et al. 2009)
4. David McConnell and colleagues' work on networked learning communities (Lally, McConnell et al. 1999; Bowskill, Foster et al. 2000; Foster, Bowskill et al. 2000; Foster, Bowskill et al. 2000; McConnell 2000; Bowskill, Foster et al. 2001; Lally, McConnell et al. 2001; Lally, McConnell et al. 2001; McConnell 2006; Bowskill and McConnell 2009)

Each of these miniature cases will be reviewed to highlight key issues and ideas in this thesis. The first 2 of these case studies relate to the use of technology to support collaborative learning in the classroom. The 3rd of these case studies relates to collaborative learning in the online environment. Table 3 below summarises the examples.

Table 2: Overview of 3 Key Examples

Author	Key Point	Relevance to the Thesis
Charles Crook	<ul style="list-style-type: none"> • Development of a shared understanding as the basis for classroom interaction • Use of technology to mediate interaction in the classroom (an ideal) 	<ul style="list-style-type: none"> • Making the shared understanding amongst a group mediates and represents and anchors meaning in the social context • Technology can be used other than to deliver external content or to explore the tutor's mind. It can also support knowledge-construction in the classroom
Making Learning Visible Project	<ul style="list-style-type: none"> • The role of documentation in learning • Making classroom learning part of the community within and beyond school 	<ul style="list-style-type: none"> • Technology to facilitate the documentation process • Peers co-constructing the documentation
Walter Stroup and colleagues	<ul style="list-style-type: none"> • Use of technology to mediate interaction in the classroom (a practice) • Technology to create social objects from interaction • Open start and end point • Student interaction and dialogue as content • Dialectic between the subject and the group situated views in the classroom 	<ul style="list-style-type: none"> • Addresses Crook's call as a practice but only in a particular subject area • New pedagogical possibilities through group-situated documentation (social objects) • Interaction centred upon knowledge-construction • Responsive to diversity of backgrounds, interests and ideas • Connecting to the subject through a group-situated perspective
David McConnell and colleagues	<ul style="list-style-type: none"> • Values are important and not just group work • Dialectical relationship between local practice and course discussion • Students dialogue and interests as the content 	<ul style="list-style-type: none"> • Group learning beyond the use of technology to organise activities. • Beyond an instrumentalist view of learning communities • A relational, social and dialectical idea of learning. • Students as co-constructors of group-situated knowledge

8.1. Charles Crook's work on collaborative learning

The main focus of the work of Charles Crook has been in schools with younger learners (Crook 1996; Crook 1998). However, the points he makes have broader application to higher education. Crook is interested in the ways that technology might be used to support learning in the classroom and how it might fit into the everyday life of a class. He usefully points to a variety of ways we might think about the use of computers in the classroom (Crook 1996). These include (with my summarised description):

- Work *with* a computer – mainly individuals working on a computer engaging with software (collaboration with the machine or the software)
- Collaboration *in relation* to computers – where items on the computer become a point for discussion in the class
- Collaboration *at* a computer – where small groups work together on a computer based problem
- Collaboration *around* a computer – where computers are part of a wider set of utilized resources
- Collaboration *through* a computer – where the computer is a medium through which people meet and discuss together

Each of these arrangements has implications for the organisation of learning and teaching in the classroom. However, I want to hold my focus upon the concept of groups that learn. In doing so, my aim is to examine Crook's ideas in terms of the processes and products that make up such a concept. In terms of processes Crook's work suggests disposition, discussion and diversity are 3 key facilitators of development.

The way that learners think, when working together, is an important aspect of collaborative learning. Crook suggests that the goal of developing a shared understanding is one that requires a motivation, on the part of those involved, to adopt an '*inter-subjective disposition*' (Crook 1998). I take this to mean that the goal of developing a shared understanding, through a process of collaboration, inclines people to direct their thinking towards the shared task and implicitly towards each other.

I regard the construction of questions by the group as a device for developing a conscious orientation towards an issue. Developing questions together, with the shared purpose of generating a public summary of the outcomes, is intended to help everyone to become oriented towards the outcome.

Fostering a disposition towards a social way of learning is important. I would argue that dispositions are also a form of perspective that serves as an orientation towards the activity and dialogue. When done collaboratively this is equivalent to perspective-forming for groups.

I noted the significance of dispositions in our earlier discussion of the MLV project (Surez 2006; Carmona and Dominguez 2008; Krechevsky, Rivard et al. 2010). I also discussed the Thinking Together project earlier and the way they used their protocol to support high-level dialogue (Wegerif, Mercer et al. 1999; Mercer 2000; Mercer 2003; Dawes and Sams 2004; Mercer 2008). These are all ways of aligning thinking and creating an orientation towards the co-construction of shared thought.

Crook is also interested in the importance of discussion in the classroom (Crook 1996). He makes the interesting point that in some ways talking has become de-valued in education and points to the often quoted idea of 'hearing' information as being inferior to 'doing.' Crook points out that 'doing' is often promoted as superior because this anecdote understands talking to mean the teacher '*telling*' students (Crook 1998).

This 'telling' is often also made up of rules, procedures and instructions rather than about the topic itself. This is quite distinct from the idea of learners talking and listening in order to make sense of their experience(s) and to reach some shared understanding as a basis for development.

We might argue that research into collaborative learning has been narrow. Crook expresses concerns about the tendency for research into collaborative learning to focus on '*speech-*

act utterances' as evidence that individuals are engaged in collaboration. This is a search for proof that collaboration is occurring. Crook is concerned that research is primarily centred upon individual psychological processes and outcomes arising from a process of collaboration.

Crook notes the findings of other researchers (Galton, Dawes, Edwards and Mercer etc.) who stress how little of the talking in a classroom is done by the learners. Similarly, they note how much of the talk, done by teachers, is administrative in nature. Blatchford and his colleagues have also noted how little of learner's talk reaches a higher level of thought (Blatchford, Kutnick et al. 2003).

Although Crook is focused upon schools, I suggest much the same would be true of higher education classrooms. Peer Instruction, the most popular technique for using electronic voting systems is premised on this exact idea (Crouch and Mazur 2001).

Much of this is the compromise of time, numbers of learners and navigating the curriculum. However, a great deal of this lack of opportunity for deeper levels of discussion is attributable to pedagogy based on the tutor's view. Whereas Peer Instruction is based upon pre-defined questions created by the tutor which are then discussed amongst peers, Shared Thinking is based around the co-construction of questions from dialogue. Both use much the same technology but with a different role in the discursive process.

This is a vision of a classroom community that also recognises and values the diversity of mental structures, different individual interests and a variety of backgrounds and histories (Crook 1998). As such, diversity is understood as an advantage rather than a barrier to learning. I am interested in looking beyond activity structures. I am keen to develop a practice that is inclusive. Rather than seeing such diversity as a challenge, I look towards a practice which benefits from diversity and the multiplicity of perspectives it offers.

I suggest that to focus on individual psychology, when considering group learning, misses the wider picture. It misses the role played by the thoughts of others interacting with individual development. In focusing upon the psychology of an individual we may miss the

interdependent nature of development in social situations. A view based upon individual psychology fails to see the dynamic between interacting thoughts (and feelings) that are shaped by and shaping the social situation. I put this forward in the context that Constructivist principles may still apply but change may be generated through a process of social influence.

Crook is interested in the idea of collaborative learning that understands the classroom community as a fluid learning entity. The class is seen as framing a dynamic interaction amongst situated individuals engaged in the shared endeavour of collective enquiry.

Thus far I have presented disposition, discussion and diversity as key processes that might inform the development of groups that learn. The product of such processes is equally important. Crook discusses the goal of his thinking as a shared understanding.

The most fundamental goal in Crook's view is to strive together towards the development of a shared understanding. This is important in the context of this thesis because my aim is to make the shared understanding in a situated group visible in order that it can function as a resource for learning.

Crook relates the idea of developing a shared understanding to Vygotsky's idea of working in the zone of proximal development (Vygotsky 1978). Crook sees the development of a shared understanding amongst a group as a way of establishing 'common ground' as a platform for development in the same way as Vygotsky discusses student-tutor interaction (Crook 1998). Crook considers this as important for small groups working at computers. He extends this idea to a similar goal for the whole class in order to work as a community. This is a worthwhile goal if it can be made visible because it creates a learning resource and infuses identity and socialisation (Stroup, Ares et al. 2004).

Developing a shared understanding also promises emotional benefits. Crook stresses that the development of 'inter-subjectivity,' through collaborative learning, offers both

affective and cognitive benefits (Crook 1996). This is achieved by raising the awareness amongst participants that they have something in common with others. The recognition of having a shared view may induce a sense of togetherness or affinity which can provide a source of emotional comfort, confidence and pleasure. I suggest that this is heightened where the shared understanding is visible.

This is a pedagogical design that looks far wider than collaboration just as a way of supporting an individual understanding of readymade questions. This is a relational view that is mindful of the orchestration of the social setting in a way that has pedagogical consequences. This is related to but distinct from Peer Instruction (Crouch and Mazur 2001).

Having considered processes and products, I should also mention the important role of technology. Crook's vision leads him to the idea that technology might have a key role to play in supporting whole-class interaction. He recognises that the establishment of 'common ground' is already achievable within small group work. He also understands the complexities of scaling this up into a classroom level of practice.

At the time he was writing this collective goal was an ideal yet to be fully achieved. The reward for achieving such a goal was as a way of providing '*a more substantial state of engagement*' (Crook 1998). My aim in this thesis is to present a practice for achieving Crook's ideal with a similar level of engagement.

Crook explores the idea of students working *through* the computer as a medium for communication. He points to a proliferation of inter-school examples where this practice is already developed and calls for this kind of activity to be considered within schools (Crook 1996). The idea of using technology to facilitate communication and knowledge-building amongst those in a classroom is interesting. This gets us away from ideas of using technology as vehicles for the delivery and discussion of readymade ideas (despite their additional value).

The development of groups that learn depends partly upon the use of technology. However, it also depends upon the changed role of the tutor. Crook discusses the role of the tutor in this vision of a classroom community. He sees the tutor '*orchestrating*' interaction that leads to the production of a shared understanding (Crook 1996).

Maintaining the analogy, this suggests a view of the musicians as producers of the music and the tutor as a conductor playing a balancing role. The tutor's role is to begin each session by re-establishing or re-visiting communal knowledge established in earlier session (Crook 1998). I would agree with this but would go further to suggest that the tutor is a co-investigator and a 'cognitive expert' (McConnell 2006).

I suggest that some of the thinking to do with group learning, as well as the rationale for introducing group learning, has been narrow and simplistic. Crook notes that current practice to do with collaborative learning has often tended to regard it as something distinguished only by its difference from individual learning. He suggests that, for some people, collaborative learning is merely the idea of '*putting people together*' (Crook 1998). Others have called collaborative approaches to learning as little more than '*groupings*' (Blatchford, Kutnick et al. 2003) with their focus being upon concerns to do with group features such as composition, numbers, gender etc.

More importantly Crook highlights a rich and broad vision of collaborative learning that is mindful of social, affective and cognitive dimensions to working as a collective learning entity. From my limited knowledge, Crook was not able to establish or locate a practice for achieving these goals at the time he was writing. It is part of the work of this thesis to respond to these needs.

In summary, Crook offers us a vision of collaborative learning *through* the computer. The goal of the collaboration is to produce a shared understanding. Taking this on board, I am suggesting that this shared understanding should incorporate a further goal – that it should be made visible as a representation of the situated knowledge in the classroom. This will

mediate interaction and offer new pedagogical possibilities through group influence. With this additional goal in mind, I turn to the next example of relevant practice.

8.2 The Making Learning Visible (MLV) Project at Harvard

In the previous chapter, I highlighted Constructionism as the externalisation of individual thought. I developed that into the notion of collective biography and the objectifying of collective thought. These ideas are evident in this next example from Harvard. This also builds upon the idea of working through the computer in the classroom and visualising a shared understanding, as was mentioned in the previous section of this chapter.

In terms of a teaching and learning practice I wish to use a related example that has been a significant source of inspiration for this thesis. This particular project is a school-oriented scheme that started in Italy. It was adopted and developed in America by the Making Learning Visible (MLV) project based at Harvard University (Surez 2006; Ritchhart 2007; Ritchhart and Perkins 2008; Krechevsky, Rivard et al. 2010).

The MLV project was interested in the value of documentation in learning. The core idea was to focus on pooling the knowledge developed in, and expressed by, whole-class groups. The project was about communicating thinking to others in a shareable and visible form. It can be done through speech, images and through documentation (Ritchhart and Perkins 2008). The aim was to foster a collective sense of enquiry that would be recorded and expressed through different means.

For some sessions the documentation would be created by the tutors who would bring together products from small group work. In other cases the class created the documentation for themselves. The aim was always to create a collective expression of the learning that had gone on in the classroom. This could be for a lesson or a series of lessons.

The project team looked at the ideas of group interaction, structures for developing interaction, and documenting whole-class learning. The project explored the impact of making learning visible. This impact was studied looking at the effects on teachers, learners and other stakeholders who all had access to classroom learning because of the way it was documented.

The team noted a number of influences upon group structures in the classroom including changes in the expectations, opportunities, atmosphere and interaction (Ritchhart 2002). This applied as much to the students in their relationship with their peers as it did to the way teachers and students worked together. The benefits of working this way included:

- Increased the emphasis on what was learned rather than upon individual products
- Provided each person with different perspectives
- A greater sense of engagement and improved individual performance
- An expanded repertoire for the use of ICT for the tutor

One other interesting points that was common to both the original Reggio-Emilio Project and the MLV derivative was that working this way created a ‘pedagogy of listening’ (Rinaldi 2005). In other words, the re-organising of the classroom, and the interaction within, caused people to listen to each other and caused a greater sense of teachers being listeners rather than talkers.

“Our theories need to be listened to by others... any theorization, from the simplest to the most refined, needs to be expressed, to be communicated, and thus to be listened to, in order to exist. It is here we recognise the values and foundations of the ‘pedagogy of listening’” (Rinaldi 2005)

Discussion Protocols

The project team explored, developed or incorporated a set of protocols to help structure the classroom interaction. These included the popular think-pair-share, brainstorming, concept-mapping and other examples widely available in the literature. The result was a

review of what they called ‘thinking routines’ for classroom interaction (Ritchhart, Palmer et al. 2006).

Specifically, that project talks about ‘thinking routines’ that help create a ‘learning disposition’ of curiosity and inquiry (Ritchhart and Perkins 2008). This is interesting for the way it seeks to align cognition to be disposed towards a social process of investigation. I am interested in achieving a similar affect and heightening it (or explaining it) through a process of self-categorisation.

Thinking routines are another form of scaffolding helping to shape the way participants look at an issue together. In the Thinking Together project, support for what was termed ‘Exploratory Talk’ was provided through a set of ground rules to help structure interaction amongst school pupils (Wegerif, Mercer et al. 1999; Wegerif 2007; Wegerif 2009; Wegerif 2009). The ‘Thinking Together’ project was particularly interested in scaffolding high-order discussion and they highlighted the reciprocal influence of social interaction on individual thinking.

Mercer reconceptualised the Vygotskian notion of scaffolding (Vygotsky, 1978) into a dialogical phenomenon (Mercer, 2000) maintained and supported by the creation of an inter-mental zone of proximal development (Fernandez, Wegerif, Mercer, & Rojas-Drummond, 2001; Mercer, 2000) – a ‘dialogical space.’ In this space, and through interaction, a shared understanding (Crook, 1996) can be developed.

My own view is that social identity (Tajfel 1969; Tajfel and et al. 1972; Tajfel 1974; Hogg 2001) may be an alternative view of the Vygotskian idea of inter-mental space (Vygotsky 1978; Vygotsky 1978) that see a process of tuning occur (Mead 1934). Social identity theory is context-sensitive and does not insist on the presence of others whilst also admitting large group membership.

Language may facilitate the creation of common ground but my own belief is that the shared sense of identity and the development of situated norms identified through the discussion may be the trigger that prompts a comparison between the self and the norms. I speculate that language is the material through which we understand and relate our thinking and behaviour but it is the norms and self-categorisation that may be important in a process of situated identification.

In some respects Exploratory Talk can be understood as a thinking routine. It consists of a set of ground rules for the way participants conduct their discussion of an issue. Thinking routines and Exploratory Talk both shape and support learning and social interaction. The Making Thinking Visible Project also used protocols for supporting reflection. These were known as the Looking at Student Thinking protocols and there are around 6 of them named and detailed on the MTV site. They include familiar routines such as think-pair-share etc.

The MLV Project identified a number of challenges that arose as a consequence of the adoption of the whole-class approach to learning. They were:

- Balancing a focus on content with a focus on learning to learn
- Making visible the link between externally imposed standards and project-centred learning in the classroom
- Being purposeful about balancing teacher-centred and student-centred learning
- Connecting learning in the classroom or school with events outside and the community beyond

These are important issues that will need to be addressed if this kind of process is to be adopted with real success. In this thesis, the Shared Thinking approach is presented as a way of visualising the thinking in a classroom. This makes the group-situated concept for a relevant topic visible and thereby turns the group into a resource for different stakeholders.

8.3 Walter Stroup's work on network-mediated inquiry in the classroom

The work of Walter Stroup and his colleagues in America could almost be seen as a response to the calls made in the work of Charles Crook. They are working in Mathematics and Physics and using handheld devices to investigate simulations and mathematical models (Stroup 2002; Stroup, Ares et al. 2004; Stroup 2005; Stroup, Ares et al. 2005; Stroup, Ares et al. 2007).

This group provides a practice for Crook's vision albeit in a particular field of study and using dedicated software. Crook was also exploring collaborative learning in UK schools. These authors have applied the vision to a higher education setting. More importantly, they point to a new pedagogical possibility in what they describe as the network-mediated classroom.

Within such an environment, their thinking and practice is centred upon the idea of '*generative activity*' (Stroup, Ares et al. 2004; Stroup, Ares et al. 2005). This involves a form of collaboration that results in some form of visible expression of thought. This design involves individuals, groups and the whole-class articulating their thinking through dialogue and interaction. Generative learning is therefore said to be 'thought-revealing' (Lesh, Carmona et al. 2002; Lesh and Doerr 2002). This is similar to Papert's Constructionism discussed in Chapter 2 of this thesis.

Papert is interested in the idea of using media to externalise individual thought. Stroup and colleagues extend this to the externalisation of collective thought using the network-mediated classroom. This follows Crook's idea of collaboration through the computer.

My aim is to develop the ideas of Stroup and his colleagues so that they can be applied to all subject areas. Based on their research, Stroup and his colleagues have developed a taxonomy of generative activity (Stroup, Ares et al. 2004). The taxonomy is as follows:

1. Space-created play - the shared projection on screen constitutes a new social space in which participants generate views. They are developed individually and together.
2. Participation - learning from participation and learning by participating in the public interaction. This applies both individually and collectively
3. Agency - not acting out but what is already known but acting a part of the dialectical process and learning that gives ownership and creates knowledge
 - 3a. Anonymity - freedom to try out an answer safely and ability to locate yourself in relation to the whole-class
 - 3b. Authorability - interaction at individual, small group and whole-class level invites students to change the nature of the interaction and influence the evolution of the activity
 - 3c. Opportunity - to contribute to the work and expand the content and representations that are the focus of the activity. This creates new awareness and discussion of related or other issues.
4. Dynamic Structure - structure emerges from individual and collective action

Stroup's work involves students interacting to manipulate different elements and features within an electronic simulation. They do so using handheld devices which are an elaborate form of remote control. These simulations are on a screen at the front of the class. The display is public and allows the actions of individuals to be seen and discussed by everyone in the room - student and tutors alike. Individuals and small groups act upon different parts of the simulation as they address a given task. The participants discuss and explore the possible and actual inputs and outcomes generated by individual and group interaction.

This is a move away from the idea of studying external and readymade content. External material may be introduced as a resource to support the actions and dialogue amongst participants but the focus here is upon the issues and ideas generated by the students as

they participate in the whole-class activity. This has been defined by Stroup and colleagues as the ‘pedagogy of content’ (Stroup, Ares et al. 2007; Ares, Stroup et al. 2009).

There are a number of dialectical relationships occurring in Stroup’s work. These dialectical relationships will be explored in the design and practice I am developing in this thesis. For instance:

1. There is a dialectical relationship between the process and the products in the network-mediated classroom. The outcomes of the process are captured by the technology and turned into social objects. These group-situated products are shaped by the process (Hegedus and Kaput 2003; Hegedus, Kaput et al. 2007). These social objects also influence subsequent activities. As such, the objects also shape the social context (Stroup 2002; Stroup, Ares et al. 2004; Stroup, Ares et al. 2007; Ares, Stroup et al. 2009).
2. There is a dialectical relationship between the subject-community and the group-situated perspective in the classroom (Stroup, Ares et al. 2004; Stroup, Ares et al. 2005). Through the process of participation the participants make sense of the subject in their social context. The thoughts, ideas and discussions amongst students are also a form of participation in the wider mathematical community.
3. There is a dialectical process between the individuals and the group-situated view. We can see how individual contributions inform the activities of the class as a whole. Similarly, the products generated by the class also inform individual thinking (Carmona and Dominguez 2008).

Pedagogically, activity in the network-mediated classroom happens at the individual, small group and whole-class level. Each of these levels provides a basis for dialogue and investigation amongst the students. As individuals and small groups make decisions and inputs, using the handsets, the outcomes and emerging possibilities become the focus of discussion. This reflects and uses the power of the group.

In my design, discussion is important as a sense-making process and also as a socialising tool. The design of Stroup’s pedagogical approach also has an impact on the nature of the talk that happens in the classroom. Stroup and colleagues report a shift from ‘monologue’

(mainly tutors talking) to ‘dialogue’ in which students do most of the talking (Stroup, Ares et al. 2007). The tutors become hosts for learning conversations amongst students. The students become the main speakers in the classroom.

I am keen to develop a pedagogy based on the students having control of their learning. This is a significant shift in terms of agency. Stroup’s work is a good example of where students have a much greater ownership and power to act in the network-mediated classroom. The tutor provides a shape and orientation but that role is largely supportive of the shared investigation undertaken by the learners. Agency and ownership reside with the learners. This is in marked contrast to the usual pattern of interaction in which the agency resides with the tutor.

Facilitation is clearly important, not least to manage the shift from one level of interaction to another. Stroup and his colleagues regard the tutor’s role is one that involves learning to ‘*manage the focus of attention*’ (Hegedus, Kaput et al. 2007; Stroup, Ares et al. 2007) in the classroom and to provide an overall framework for the interaction. This involves the tutor indicating specific parts of the screen or particular consequences of input made by participants.

The idea of developing a classroom community is central to my design approach. Through the process of orchestration, Stroup sees tutors as promoting the ‘*infusion of individual and social identity into the classroom*’ (Hegedus and Kaput 2003). This is partly from sharing a view of the input decisions each student makes and partly from the dialogue that explores and explains those decisions.

The technology plays an important part in the pedagogical process. On the one hand, it supports interaction at different levels and, on the other hand, it helps to record and share the outcomes. The technology therefore helps to create a learning environment in which the participants work together. This is certainly a part of the design ideas that have gone into the Shared Thinking approach.

This ‘space,’ created by the technology, is recognised as one that facilitates a ‘*playful*’ approach to collaborative learning mediated by the technology (Stroup, Ares et al. 2004). Students often feel a game-like quality in this approach to learning. I am also hoping that my design will be similarly enjoyable.

Student diversity can be seen as a challenge to some educators. Charles Crook talked about the need to recognise the diversity of backgrounds, interests and mental structures that learners bring into the classroom (Crook 1998). The work described in this thesis is a strategy that regards diversity as a group advantage.

In the network-mediated classroom that same diversity is seen as the ‘engine’ for success of the activity (Stroup, Ares et al. 2004; Stroup, Ares et al. 2007). Different ideas and actions enrich the environment with multiple perspectives. Those inputs constitute a learning resource for all involved. As such diversity drives the ‘*emergence of content and development*’ (Stroup, Ares et al. 2007).

The communication of ideas, as a form of generative learning, is understood as a way of working that helps participants to make sense of each other and of the subject (Carmona and Dominguez 2008). I also seek to develop a view of the different and situated perspectives with each in relation to the others. This should deepen the understanding of the situation.

Although the work discussed in this thesis does not involve mathematical simulations there are strong similarities between Stroup’s work and that which is described in the Shared Thinking design presented here. For instance, this idea of individual and group actions being made public is common to both. Likewise, the idea that the inputs, outcomes and dialogue should be the ‘content’ of the course is also a core part of both strategies. I am interested in the idea that Shared Thinking might provide a more generic application in the technology-rich classroom. It may be thought of as a tool for the tutor to use at particular times.

There are many profound implications to be drawn from Stroup's work and which inform my own design. Content-wise, this includes the idea of an open starting and finishing point for a classroom session. It includes capturing the inputs as social objects in a process that documents situated thought. In both designs the students are co-constructing the agenda and the outcomes as part of a social investigation. These are ideas to be valued and explored in this thesis.

The theoretical bedrock chosen by Stroup for the discussion of network-mediated classrooms is Generative Learning Theory (Wittrock 1989; Kourilsky and Wittrock 1992). This refers to the co-production of expressive forms that help link existing and new information in order to create new understandings (Stroup, Ares et al. 2004). Personally, I feel Interactionism captures the central issue of dialectical relationships that underpin the work of Stroup and that are also a key part of the Shared Thinking design.

8.4 David McConnell's work on networked collaborative learning

I feel that the work of David McConnell and colleagues resonates with the issues and practices I am presenting in this thesis. I see this work as important because it introduces values into group work. This is something I applaud and support because values underpin design and actions in many instances.

The work of David McConnell and some of his colleagues has explored the idea of collaborative learning in the networked environment. Central to this body of research is the idea of participants working in a learning community. This online approach to learning is defined as '*a cohesive community that embodies a culture of learning*' and one in which '*members are involved in a collective effort of understanding*' (McConnell 2000; McConnell 2006).

Networked learning has also been defined as: "*learning in which ICT [technology] is used to promote connections: between one learner and other learners; between learners and*

tutors; between a learning community and its learning resources” (Goodyear 2005). The development of relationships between participants is the basis of learning activity and it is as much about affective issues as it is about cognitive aspects of learning.

In this approach to learning, participants work flexibly within an overall schedule. As with the work of Walter Stroup above, and within that overall schedule, participants are not constrained by fixed starting and finishing points. The issues they raise are open to discussion and based upon their own practices. As such the participants introduce different issues and the outcomes of collaboration are not known beforehand. Once again this constitutes the ‘content’ of the course.

In a spirit of open enquiry and collaborative problem-solving, participants bring issues, follow particular interests and share resources. In this way, the dialogue and activity on the course is driven by the participation of the membership, both individually and collectively.

A theory of participatory learning might seem appropriate to both Stroup and McConnell and both have used a socio-cultural framework to frame and investigate aspects of their work. I have chosen social identity theory which is derived from social psychology to explore and understand agency and dialectical relationships in this kind of approach.

McConnell is interesting for the way he highlights a range of values that mark out this kind of approach to learning. Openness is one example at the heart of this form of collaborative learning. This refers to the way that participants need to be willing to share ideas, experiences and practices with other participants.

It also means being open to participation in a dialogue. This means being open to discussing your own practice and to join in discussions to do with the practice of others. Participants need to be open to providing support for others on the course. This involves a lot of trust amongst those involved to feel comfortable in disclosing feelings and thoughts. Personal lives are often discussed alongside pedagogical issues in these settings.

Participants on the course also need to inhabit a certain view of others. Values such as showing a mutual respect for the thoughts and feelings of others are central to this way of working online together. This includes a willingness to be involved in a process of negotiation with others about the focus of shared work, and also the negotiation of meaning in general, are also part of the values that form part of networked collaborative learning.

The point I am making here is that these ways of working and learning together are far more than simply being in groups. They are about values, attitudes and disposition as well as about ideas. They involve being open to uncertainty about your own work and that of others involved. Above all they are equally about affective issues and cognitive matters, all within a social and relational view of learning. This is a view of learning that understands individuals in a holistic manner and in relation to others.

Within the overall framework of a networked learning community McConnell and colleagues mark out 2 kinds of group work (McConnell 2000; McConnell 2006). The first of these is collaborative learning. This is characterised by work conducted as a whole group and they work together on a single project. There is a great deal of negotiation around the possible focus, the process and the development of the final product. Then there is the division of labour and a responsibility towards each other to reach the final product. A great deal of trust and personal responsibility is required but it is as much a sense of responsibility to others as to the self. Responsibility is shared and this extends to the tutor.

The second form of group work adopted within the networked learning community model is cooperative learning. This is an approach that involves individuals developing a personal project in small groups. The group provides support for the development of individual thinking by participating in dialogue, the sharing of ideas and the provision of emotional support.

In both forms of group work the group functions as a resource for everyone involved. It is an emotional support and a cognitive support and it is shared and available to everyone

involved. Each participant is 'scaffolded' by being able to relate their personal thoughts and local practices to those of others.

In this model of collaborative learning the tutor has various roles. The tutor is seen as someone more familiar with the learning model being deployed and explored by the community. McConnell therefore regards the tutor as a 'cognitive expert' (McConnell 2000). Other roles for the tutor include facilitator, co-investigator and institutional representative.

The technology functions as an online and distributed learning environment. In networked collaborative learning technology creates 'spaces' for social interaction, dialogue and distributed problem-solving. Technology allows everyone the opportunity for flexible participation. It also provides a meeting place and a bridge between the different individuals and their respective locations and the course community. This is a social learning environment.

Technology also plays another important role on the course. It creates a 'safe' space in which to discuss and explore the personal and professional lives of participants. Learners are understood as people with rounded often difficult lives that run in parallel to the course. They are far from being understood as consumers of knowledge on a course. The technology is therefore a social environment that is a gated community.

This is informative in the context of this thesis. One of the ideas, central to the work I am developing, is that the classroom can work in a similar way allowing participants to bring in their distributed experiences and diverse backgrounds as legitimate material for the community interaction. Areas of learning such as work-placements have been critiqued for the struggle higher education has had with finding pedagogy suitable to offer depth and also identifying issues worthy of study at the level of higher education. I suggest that sharing experiences and ideas in a classroom in the way presented in this thesis may offer a basis for development. This is based on the use of technology to create an environment and a safe space for the classroom community.

The course described by McConnell offers an experiential learning model. The course is about the use of technology for learning. Specifically it is about the use of technology for a form of learning based on the ideas and needs – emotional and cognitive – of participants.

Through their involvement with networked collaborative learning, learners develop a deeper understanding of the issues, from both a provider and a participant perspective. They also hopefully come to understand that this social approach to learning is not about the digestion of readymade content but the creation and co-construction of situated meaning. This is also personalised kind of learning – practically, philosophically and psychologically – as participants relate their practice as a perspective with others on the course.

Agency in this form of learning is individual, collective and technological. The technology provides an overall shape but the way that the technology is available to participants is also a feature of the facilitation of agency in the community. This means that participants decide to use certain technologies and neglect others according to their needs and interests. Tutors build the initial shape and reveal each module in sequence. The students decide how the space(s) should be used and who inhabits which spaces. These decisions are part of the overall social process of negotiation.

As with Stroup, there is also a dialectical relationship at the heart of this course. This is between the local practices of participants and the course. Ideas generated in the course feed back into the local practice. Equally the reverse is true. Issues that arise in each participant's local practice are the material of the course. These issues feed into the course discussions. We can therefore see local and course practices informing each other.

As with Stroup, participants are in a dialectical relationship with the subject. In this case that subject is networked learning. The learners become more expert as practitioners through an emerging group-situated view of what it means to become a networked learning practitioner. This is developed through a comparison of local and course practices that are related to each participants understanding of what networked learning might mean.

From a theoretical perspective, the course is based upon 3 different notions of community. Primarily, networked collaborative learning is based around the idea of learning communities, as defined above. McConnell also relates learning communities to the notion of participation in Communities of Practice (Lave and Wenger 1991; Wenger 1998; Wenger 2007) by again adopting a participatory frame of reference. This refers to participation in a community of educators and specifically those interested in the use of technology to support learning.

Finally, there is reference to knowledge-building communities (Scardamalia and Bereiter 1994; Scardamalia 2002; Bereiter and Scardamalia 2003; Scardamalia and Bereiter 2006). These are communities interested and involved in developing knowledge as a resource for each individual. Again, each individual relates to the co-constructed knowledge from their own perspective.

Above all networked collaborative learning is a social and interpretative approach to learning and it has certain core values which are social and individual. It is an investigation into collaboration in networked environments. As such it has an interest in strategies and techniques (pedagogy) but it has a richer social element and an agency that looks far beyond group work as merely structural. Participants interpret different practices, including the course as a practice, and negotiate meaning individually and collaboratively (McConnell 2006).

9. Discussion

I began this chapter reflecting on the initial idea of psychosocial learning design as an organising framework for thinking about learning in the technology-rich classroom. That was an issue raised in Chapter One.

I then recalled the previous chapter in which I identified social identity theory as appropriate to psychosocial learning design. All of these ideas – design, theory and

practice – are focused at the collective level as a means of improving learning support for individuals. They are all directed at finding an appropriate way of thinking about the technology-rich classroom.

In this chapter I sought to develop a practice for collective work. This chapter looked at group learning in the literature. I defined groups, group-knowledge, group-development and group-strategies for learning. I also noted various problems related to group learning.

I discussed Vygotsky's Zone of Proximal Development and re-conceptualised it as a set of social norms brought into mind when an individual identifies with, and is mindful of, a group. Group members need not be present in social identity theory. I have put forward the idea of making the classroom community into the salient group for all involved and the activity in the technology rich classroom is seen as organising a shared sense of social identity.

The aim is that each participant will self-categorise themselves as a member of the group and engage with the visualised norms for that particular group. This is not just a dialogical space between peers (Wegerif, Mercer et al. 1999; Mercer 2000; Mercer 2003; Dawes and Sams 2004; Mercer 2008). It is a source of influence that is involuntarily active when the group identity is activated.

In order to achieve this aim, I have produced a learning technique called Shared Thinking. I have defined this as a practice for the technology-rich classroom. I feel this is in tune with the idea of a psychosocial learning design and social identity theory. To this is added a practice.

In proposing the Shared Thinking approach, I am taking on board the work of Charles Crook. He had the idealised view of collaboration in the classroom supported by technology. His ambition was the development of a shared understanding *through* the use

of technology for the whole-class. This is important because it allows us to use the idea of a shared understanding as a form of mediation amongst participants.

The second example considered was the Making Learning Visible project. In that work a tutor might document the work of a school classroom. That documentation process functioned as a learning resource for the classroom community. It also supported a widening access and the participation of the community.

The work of Walter Stroup and his associates provided the third example. In that body of work I am particularly interested in the ability and use of technology to support whole-group enquiry. Their work also used handheld devices in the classroom to generate a particular disposition of shared inquiry. The interaction in those classes was also interesting for the way it generated social objects that informed further pedagogical possibilities. Their favoured theoretical framework appears to be generative learning theory (Wittrock 1989; Kourilsky and Wittrock 1992) which explores agency and participation.

In my final example, I looked at the work of David McConnell and colleagues. This highlighted the dialectical relationship between the course and the individual work-context. By this I mean that the meanings constructed in the online course space that brings together different individuals and their practices, feeds back into each person's local practice. Similarly, each individual makes a contribution to the collective understanding that emerges over the life of the online course. They are mutually informative.

I particularly highlighted the idea of students bringing their interests, beliefs and personal practice to the course as content. This is an approach to learning design that allows for different starting points and different end points. This is in contrast to an instructional systems design (ISD) model. These principles are part of the approach taken in this thesis.

Also in this chapter, I have looked at agency, mediation and a dialectical view of development. These are themes that inform my thinking and this particular idea of learning. I have used these opening three chapters to set the scene for an approach to design, theory and practice for the technology rich classroom. In the next chapter, I review the research methods used in this thesis. This will be a gateway to present and discuss the case studies that bear witness to these new possibilities.

Chapter 4: Research Methods and Methodology

1. Introduction

The term 'research' refers to a systematic inquiry. It is distinct from a casual investigation of a topic. It uses tools and techniques to gather data in a controlled manner in order: to draw conclusions; or to solve problems; or to test a hypothesis; or generate a hypothesis. The notion of control is problematic in natural environments. The level to which inquiry is systematic may also be determined by resources, aims etc.

A research methodology is a conceptual framework to help a researcher to determine the most appropriate methods to use. Specifically, the methodology is a guiding theory for how research should be conducted. Typically, there are qualitative and quantitative methodologies. There are also mixed approaches.

According to one book, research methods are "*the range of approaches used in educational research to gather data*" (Cohen and Manion 1994). Specifically, these are data gathering techniques. They might include focus groups, questionnaires or surveys. The selection of research methods may be partially or wholly determined by the chosen methodology.

2. Personal Background to this Research

By way of background, I am an educational consultant. My practice is based around support for academics and practitioners to use technology for learning, teaching and research. Almost all of my practice is centred upon the use of online technology. I provide support for design, theory and practice. Some of my work takes the form of face to face events to help introduce and discuss issues and concerns with clients. Other parts of my

work involve designing, implementing and tutoring online experiential approaches to professional development.

The reason I undertook this scholarship was to develop an area of my practice that was new to me. This is the use of interactive classroom technologies for teaching, learning and research. There are several such technologies which include the use of interactive whiteboards and electronic voting technologies. Other technologies are emerging for the classroom such as interactive tables. In this thesis, I group them all under the term ‘technology-rich classroom.’

For practical reasons, and due to the particulars of the scholarship, I have contained my investigation of the technology-rich classroom to an investigation of electronic voting systems. There was one case study in this thesis that also involved the use of interactive whiteboards.

3. Aims of this Research

There are two aims in this research. These aims are:

1. To explore the *structural* and pedagogical processes associated with the development and use of this technique
2. To develop a *theoretical* explanation that might account for the technique that takes account of the relationships between all those involved.

In the first aim, I am focused upon the process issues. This relates to the different ways we can use the technique in practice. It also takes account of different ways in which we might modify, extend or manipulate aspects of the process to develop pedagogical applications for different settings. This follows on from the work done in chapter three of this thesis.

The second aim picks up on the work done in chapter three which seeks to develop a theoretical account of this technique. This acknowledges that group learning should be conceptualised as more than a structural issue.

By addressing both these aims, this should help to address the hypothesis. Specifically, it should help address the second part of the hypothesis. This is the part concerned with a new basis for learning, teaching and research.

Based on this, the analysis will use learning, teaching and research as the big themes under which an initial sorting of the data will be done. Within those three big themes I will use the sub-headings from the literature on classroom technologies that appear to relate most to the technique being explored in this thesis.

A grounded view of the implementation of this technique in different settings should therefore seek to illuminate the flexibility and potential (or otherwise) of the technique. That is a way of understanding the process aspects of the technique.

Interviewing participants with the same question structure should also support the goal of generalising about the practice. This will contribute towards the understanding of the psychological impact of the process across different settings. That will contribute towards the theoretical project of this thesis.

The overall picture should then be weak in whether the findings are representative but strong in the way it will address both of the stated aims. Both aims are equally important if we are to address the hypothesis stated below. In other words, if the first claim is upheld, then only by addressing both aims can we gain a picture of a new basis for learning, teaching and research. It will also support the achievement of those two aims in a way which is practical for one person with limited time and resources available.

4. Hypothesis for this Research

A hypothesis is “*a conjectural statement, a tentative proposition, about the relation between two or more phenomena or variables*” (Kerlinger 1986). It might take the form ‘if this happens then that will follow.’ Based on this, the hypothesis put forward in this thesis is as follows:

If we can extract the diversity of thoughts and feelings in the classroom, derived from a process of reflective dialogue amongst everyone involved, and if by using technology we make them visible so that they can function as a resource, then we may have a new basis for learning, teaching and research.

This hypothesis was generated after the first implementation of what later became known as the Shared Thinking approach. The first part was a working description of what seemed to be happening in the activity. The second part was the emerging but intangible sense that this might be something different, at least with regard to the use of this technology.

The idea was to use this hypothesis statement as an organiser for the research. The ‘*new basis*’ which I allude to in this hypothesis relates to the different aspects that might be effected by the use of this strategy in particular circumstances, namely in the technology-rich classroom.

Following on from the previous section of this chapter, and aligned to the hypothesis above, these different aspects appeared to provide a framework of themes for investigating the Shared Thinking technique in the technology-rich classroom. The aim was therefore to explore the Shared Thinking technique in different settings focusing upon three possible levels of impact. They were:

1. The individual level
2. The pedagogical level
3. The research level

5. Research Methodology in this Thesis

This work uses a qualitative approach to investigating the technology-rich classroom. The aim is to develop a design approach, a theory and a practice for using technologies such as electronic voting systems in the classroom.

An initial classroom activity structure, later called Shared Thinking, brought together a traditional snowball group discussion technique with the use of electronic voting systems. This activity was reported in Chapter One.

The Shared Thinking technique became the focus of the research reported here. The aim was to understand the features, challenges and possibilities for developing this as a practice. To explore this, the initial Shared Thinking activity structure was adapted and implemented in different natural settings.

It was not possible to control many of these variables due to the diversity of settings and different audiences participating in the activities. There were also a range of different purposes to which the Shared Thinking technique was applied.

In order to investigate the Shared Thinking technique adjustments were made from one setting to another. Some of those modifications were the result of changes demanded by the social setting. Other modifications were the result of changes arising from a previous implementation.

From this perspective, the notion of control was not always appropriate or practical. There was however some controls that were possible. These included the number of case studies, the tools to be used and the issues that were repeated. For all these reasons a qualitative research method seemed appropriate.

6. Research Methods in this Thesis

This research used a case study strategy. It includes five distinct but related case studies of the implementation of the Shared Thinking technique. The data sources included semi-structured interviews; audio recording of the small group discussions; and the Shared Thinking technique was also a method for capturing the options and the distribution of votes in the whole-group.

6.1 Case study research strategy

Case studies offer an alternative to experimental and statistical approach to research (Cohen and Manion 1994). However, it is important to note that case studies strategies can include qualitative or quantitative evidence (Yin 1981). The data used in this research was largely qualitative in nature although there were some statistical details of which various pie-charts provide an example.

Definition of case studies

Case studies typically involve the investigation “*of an individual unit – a child, a clique, a class, a school or a community. The aim is to probe deeply and to analyse intensively the multifarious phenomena that constitute a life cycle of the unit with a view to establishing generalizations about the wider population to which that unit belongs*” (Cohen and Manion 1994).

Elsewhere they are defined in a similar way as “*an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used*” (Yin 1984)

In this thesis, the unit is the Shared Thinking learning design implemented in different classroom settings. The term ‘classroom’ is interpreted broadly to stand for any collective involved in learning together within a given face to face situation.

Types of case studies

Despite being a largely qualitative technique it is still equally possible to develop statistical case studies. More importantly, there are 2 principle types of case study research – participant and non-participant observation (Cohen and Manion 1994). The first of these is a participant-observation. This is where the researcher plays an active part, often as one of the group being observed, in the research context.

The second of these is, unsurprisingly, non-participant observation. This is where the researcher makes no active intervention in the investigation of the given unit. An example would be where a researcher observes a lecture or sits in a classroom taking notes.

In this thesis, the researcher was a participant and did have some influence in each situation. The researcher was the designer and facilitator of each workshop and also a respondent to questions that were raised. However, the researcher was not a member of the group as such. There was always a clear distinction between the researcher and the formal sense of the participants.

Yin, a recognised expert in the field of case study research, notes 3 kinds of case study. They are exploratory, descriptive and explanatory (Yin 1981; Yin 1984). According to Yin, an explanatory case study “*consists of: (a) an accurate rendition of the facts of the case, (b) some consideration of alternative explanations of these facts, and (c) a conclusion based on the single explanation that appears most congruent with the facts*” (Yin 1981).

This thesis is principally an explanatory case study. It seeks to explain the learning design, as a phenomenon, enacted in different settings. The goal is to develop an explanation of how the design 'works' in practice(s). There is of course an element of exploration and description in this thesis as well.

Advantages of case studies

According to Cohen and Manion, case studies are perhaps most favoured for being centred upon reality. Case studies are a naturalistic method of investigating phenomenon. They are also '*small steps in action*' (Cohen and Manion 1994).

The case study strategy also allows for quantitative and qualitative approaches – alone or together (Yin 1984; Yin 2003). One point that comes out of reading different articles on case study research is the enormous flexibility of this strategy.

With regard to validity, it is an approach that allows for a considerable variation in numbers – both in terms of participants and in the number of case studies. When we use a case study strategy we are not seeking statistical validity. We are seeking to illuminate the issue under review and in context. It is therefore perfectly reasonable to have a single case study approach where, for example, it is an investigation into a rare situation or where it is a critical test of a particular theory (Yin 2003).

The case study strategy, as a test of any validity, is therefore an issue of how naturalistic it is in its portrayal of the social context rather than being something quantity-related. Indeed Yin points out that to view case study strategies in terms of numbers of case studies and how representative it may be of the wider world is to misunderstand the purpose and value of this strategy (Yin 1981).

Problems associated with the use of case studies

Each setting is distinct and that may be something that militates against replication in any scientific controlled experiment. Although some control over key variables is possible, a case study approach in no way allows for the manipulation of variables in any scientific sense. Case studies are often seen as subjective and not generalizable to the wider world (Myers 2000).

At the same time this is not a goal of case study research. Case study strategies can be used to illuminate a specific context. With every context acknowledged as being different in qualitative research, it makes no sense to expect findings to fit every situation (Yin 1981; Myers 2000; Yin 2003).

The number of case studies required to be a sound basis for generalization is sometimes seen as one potential problem. Yin refutes this arguing that much depends upon the detail, the type of case study approach used and the purpose for which it is used (Yin 1984; Yin 2003).

This thesis offers five case studies and whilst it is acknowledged that further research is needed I argue this is adequate to develop useful insights. I have also purposely located case studies from different settings and with different participants to add to a sense of naturalistic validity (as opposed to statistical validity).

Within a given case study there are dangers that the researcher can influence the experience and the research outcomes (Cohen and Manion 1994). Whilst acknowledging this to be true, this was also one of the strengths of my participation. It allowed data-gathering opportunities that would not have been available or recognisable had someone else conducted the sessions in my absence. This is partly because each case study was understood in the context of other case studies that may have preceded or followed any given workshop.

Case Study Selection

To select the case studies, I made enquiries with a small network of individuals I knew from the world of learning technology. Those people either offered help in putting me in touch with people that might be interested in this research or they offered to be directly involved.

In case study 1, a colleague contacted a group of people known to her and two tutors came forward from that process. They identified two cohorts of students that might benefit from the planned workshop experience.

In case study two, I registered to put on a workshop at a national conference. The workshop was one of several available in a particular timeslot at the conference. People interested in the workshop for Shared Thinking arrived and participated of their own free will.

In case study three, a supervisor volunteered one of his faculty induction sessions to repeat the first case study which was also for induction and transition. In case study four, I contacted a learning technology support person at the university asking if he knew anyone that might be interested in participation. He located someone expressing an interest in participation.

Finally, in case study five a contact at another university was emailed to see if she knew of anyone that might be interested in participating. She replied to say that the tutors in her department were willing and interested to participate.

Cross-Case Analysis

Where there is one or more case studies in a piece of research, as in the case of this thesis, there are challenges to look across them in order to generalize findings at a broader level. Yin notes two approaches to this issue. The first of these is case-survey and the second is case-comparison analysis (Yin 1981).

In case-survey analysis, involves isolating a particular factor and examining it across multiple case studies. This may be difficult both from the perspective of isolating a given issue and also having an adequate number of instances to explore it in depth.

In the case-comparison analysis, the researcher may look for certain factors to investigate across different case studies in order to theorize around a particular issue. This may involve some modification from one case to another in order to focus and explore a particular aspect across different case studies. Lessons from each case may help provide an explanation of a particular issue. This thesis, adopts this case-comparison approach to analysis by looking at three levels across all five case studies.

Data Sources within the Case Study Strategy

Retrospectively, it is useful to think of each case study as having a before, during and after dimension. Within each of these phases there were various key elements that were part of each case study.

Pre-Implementation

Prior to carrying out any intervention, and where the sessions would involve students, a number of preparatory activities were undertaken:

- A meeting with the tutor(s) was arranged to identify a key problem to be addressed and to brief them on the research and the emerging practice
- A design was created to adapt the core idea and practice of Shared Thinking to the ideas developed from the discussions with the tutor(s). This would also be made appropriate to the circumstances as well as to the target audience.
- The design idea would be communicated to the tutor(s) at another meeting. This would allow for discussion, clarification and any modification.
- A final design was communicated to the tutor(s) for final approval before dates etc. were set.

During Implementation

Within each case study there were certain elements that were a feature of all instances of implementation and were intended to provide different ways of gathering data. They were:

- A sheet of paper with a single question to be used by each individual as a way of orientating themselves to the session and to prepare them for the small group discussion that was to follow. These sheets were collected in after the first part of the Shared Thinking sessions.
- Audio recording of the small-group discussions were captured in several case studies. One group would be approached and asked if they would mind being recorded. If they said yes then the audio recorder would be switched on and left in the middle of the table/group until the voting stage.
- Voting data was automatically captured. This included the student-generated options and the outcomes of the individual votes. The use of voting technology meant that this was captured and displayed as a chart.
- Observation notes were recorded. These were notes made up of my own thoughts at the time, from any comments made by a given participant during the session, or they might be notes made shortly after the session was complete. In this latter instance, I would record my thoughts in an email to myself. Similarly, I made email notes that might connect thoughts drawn from a previous implementation with observations made in a current instance.

Post-Implementation

Following the completion of a particular implementation of Shared Thinking a number of follow-up actions were taken. These were not necessarily used in every case but they included:

- Participants that left both their names and an email address were contacted to invite them to participate in an interview.
- Participants were emailed a follow-up questionnaire. This happened in the first case study where contact details were not gathered and we only had email addresses for the volunteers. Participants were contacted to arrange a date and time for a telephone interview
- Participants were telephoned using Skype or a standard telephone. These calls were recorded. Participants were informed at the start that calls were being recorded. Participants were also given a briefing in accordance with ethical requirements.

This information included details of the research supervisor to contact in the event of any concerns arising from the conduct of the phone call or any other aspect of the research activity that may give rise to concern.

This information also included a notice to the participants that all data would be made anonymous and that only members of the research team would have access to the data. It was also mentioned to each participant that nothing in any contact would be traceable back to them nor would it have any impact upon their course.

The recording was done in two ways. It was carried out by using Audacity recording software to pick up all that was said in a Skype call. It was also done by holding a hand-held digital voice recorder to the computer speakers and/or the telephone.

This was done, as a 'belt and braces' approach to make sure that data was captured. Where the telephone was used to interview participants, the phone was put on loud speaker so as

to capture both ends of the conversation. Audacity was also used in cases involving the use of the telephone as a back-up. All the interviews were then transcribed for analysis.

6.2 Semi-Structured Interviews

The definition of a research interview in this thesis is “*a two-person conversation initiated by the interviewer for the specific purpose of obtaining research-relevant information, and focused by him on content specified by research objectives of systematic description, prediction, or explanation*” (Cannell and Kahn 1968) as cited in (Cohen and Manion 1994)

There are a variety of possible techniques used in social science research of which the interview is but one. The semi-structured interview has benefits over the use of a questionnaire because it allows much more probing by the interviewer and a more detailed response by the interviewee (Cohen and Manion 1994).

The semi-structured interview is one of several different interview techniques. These include formal interviews in which a specific set of questions are asked and that set forms the boundaries of the discussion. At the other end of the scale, a number of issues might be identified and the structure and the particular questions asked are entirely flexible (Cohen and Manion 1994). Semi-structured interviews are at the mid-point of these different techniques.

Problems of using interviews include reduced motivation where they are too long or of less interest to the interviewee than to the interviewer (Herzog and Bachman 1981); the extent to which a question may shape the response, the attitudes and opinions of the interviewer and interviewee and misunderstandings of the meaning or intention of the question being asked (Cohen and Manion 1994). To take account of these factors, the interviews followed the interests of the interviewee as much as possible and questions were re-phrased wherever the interviewer perceived confusion may have occurred.

Interview Structure

Each interview lasted between 45 minutes to an hour. A structure was defined for each interview with a set of questions already specified. The same question structure was used for each interview across all case studies.

The interview questions followed the core Shared Thinking design structure. This structure was chosen as a way of investigating the different parts of the Shared Thinking process.

The interview structure was as follows:

1. What were your general impressions of the session?
2. How much did it help to write down your thoughts first?
3. What was the nature of the small group discussions?
4. How did you reach a decision in your small group?
5. What impact did it have hearing and seeing the set of options from each group?
6. How did you decide which option to vote for?
7. What was the impact of seeing the results of the votes in the pie-chart?

In the interviews conducted for this thesis, although each question was addressed as part of the conversation, the *emphasis* was determined by the unfolding dialogue. Where an issue was raised by a participant that fell outside the set questions that issue was followed as a focus deemed salient by the participant.

This allowed the semi-structured approach to admit a phenomenological pattern in which the goal is to explore and understand the participant-experience and perspective. The semi-structured interview is recognised as a preferred method of phenomenological research (Marton and Booth 1997) and seems therefore to be appropriate

Interviewee Selection

In each workshop, participants were given a sheet of paper with the orientation question. At the bottom of the sheet was an invitation to participate in the research by volunteering to be interviewed.

A space was given at the bottom of the sheet of paper for participants to provide their names and an email address if they were willing to be contacted for an interview. The sheets were collected in at the end of the session.

Those participants offering their contact details at the bottom of the sheet were followed up with an email. That email thanked them for participating in the session and for volunteering to be contacted as part of the research.

Those volunteering were asked to provide a telephone number and they were also asked to identify a day and a time that would suit them best to be contacted. When a date and time was agreed they were contacted by the researcher to carry out the interview.

All those volunteering to be interviewed were included. This averaged three participants for each case study. This had limitations in terms of how representative they might be of their group. Equally, it did also offer a practical way of looking across the case studies which was the goal of the study. The aim was to understand how the technique would work and the idea was to test it across intentionally diverse groups, applications and settings.

Familiarity of Participants to Each Other

These case studies were arranged in an opportunistic manner. It was not possible to control the tutors or students that were available to participate in this study. Those that were

involved were the people willing and accessible to me in the time available. This may well have implications for the data in terms of validity and the extent to which it is representative. Further research is required to explore these issues in a more controlled manner.

In cases one and three the technique was used for induction and transition. The induction participants did not know each other as they had just arrived at their respective institutions. The second year students participating in the transition sessions would have been more likely to know some or all of their peers.

In the second case study, the participants were attending a conference but each had a similar role albeit in different institutions. Some of the participants may have known each other or may be familiar to others by name. Some may not have known each other.

In the fourth case study, it is likely that participants would have some familiarity with each other. These were students in the final year of their course. In the final case study the participants were very likely to have known each other. These individuals were all tutors in the same academic department at a university.

6.3 Shared Thinking technique

The use of the electronic voting systems is a facilitator for the whole-group to reflect together. From that perspective it is a pedagogical tool. It can equally be regarded as a tool for research for the way it gathers data about the collective experience.

Retrospectively, I have become aware of different ways of working with this technique for data gathering purposes. This includes the ability to understand collective experience at a particular moment for a particular group.

It is also possible to investigate a series of moments in the life of a whole-group. This might be before, during and after a year on a course for example. It is equally possible to use the technique to investigate a comparative view of collective experience.

The 'core' technique was adapted to meet the needs of different case studies. As mentioned in chapter one, the Shared Thinking technique in its basic form is as follows:

- Individuals write down their personal view on the topic-focus
- Move into small groups to share individual views
- Each group identifies one aspect to be recorded on the screen
- Create a set of question-options from the discussions
- Each individual votes on the aspect they see as most significant
- Voting generates a pie-chart on the public screen
- Plenary discussion on issues arising

The small groups typically included 4-5 people. Each small group proposed an option to be typed onto the screen by the facilitator. When all the options were recorded then the participants were invited to vote. Each person would vote using individual handsets.

The sessions in the case studies lasted between 1-2 hours. Most were two hours long. Only case studies two and five were one hour. All the options from the small groups were shown on their respective pie-charts with the percentage of votes polled for that option. These pie-charts were the result of individual votes being aggregated on the screen using the technology. Once the pie-charts were generated the tutor or mentors would respond. Examples of the small group outputs and the results of the voting (the pie-charts) are shown in the case studies.

7. Ethics

Prior to each workshop/case study, all the documents required by the School of Education and/or the University of Glasgow were completed, returned and approved.

A request for similar ethical approval from the participating institution or department was also requested. Research involving students at other universities meant that both institutions had to provide ethical approval before any fieldwork could begin.

7.1 Workshops and Ethics

The bulleted list below provides an overview of the instructions and ethical issues addressed as part of each workshop. The term workshop is a generic term used here to define the point at which the Shared Thinking technique was implemented within any given case study.

- Prior to the start of any workshop, carried out as part of this research, an announcement was made that this was part of research primarily being carried out at the University of Glasgow.
- It was also announced that this was part of research collaboration with the host university.
- It was announced to any students that there would be no implications for participation or assessment on their course.
- It was announced that there was no obligation to participate in any form and that they were free to leave with no adverse consequences if they preferred not to be involved. They could also drop out at any time without any repercussions.
- The name of the supervisor was announced and each student was told email addresses were available on the web, from me or from their tutor should they have any concerns over anything to do with this research activity.
- It was also announced that any data gathered would be entirely anonymous and it would not be traceable back to any individual.

7.2 Telephone Interviews and Ethics

The bulleted list below provides an overview of the instructions and ethical issues addressed as part of each interview conducted as part of this research. Only in case study five were the interviews conducted face to face. The rest were all conducted by telephone.

- When volunteers were contacted by telephone they were again told that this was part of formal research being conducted at the University of Glasgow.
- Interviewees were told at the start that all data would be anonymous and would not be traceable to them.
- Interviewees were told the name of the chief supervisor and how he could be contacted.
- Interviewees were told that the phone call would be recorded.
- Interviewees were told that the call would typically last between 30-45 minutes.
- This information can be validated on the audio recordings made of the interviews.

8. Data Analysis

In this section, I will provide details of how the analysis was approached within and across case studies. Central to this provision is the understanding that the goal is to address the stated aims and hypothesis. For this reason, the analysis was structured to reflect those aims and to address both the theoretical and process issues of the inquiry. This is an inquiry into Shared Thinking technique.

Orientation to the Analysis

Following an interpretive approach, the goal of the research and each case study was to understand the Shared Thinking intervention from the perspective of the participants. This is also part of the wider aim of developing theory from a grounded approach (Cohen and Manion 1994).

Interpretive approaches to data analysis seek to induce meaning as it emerges from the data. This is in opposition to a positivist view which assumes phenomenon can be objectively known and studied. In this respect, theory does not come before the research. Theory emerges from interpretation of the data and the researcher is understood as having prior constructions of the research process (Cohen and Manion 1994).

Interpretive research is exploratory with the aim of understanding the perspective of participants. The purpose of the research is to describe the particular from the participant perspective.

In this instance, the interpretive approach also involved an attempt to engage with the literature in parallel with an investigation of the participant experience. In this sense, the literature and the investigation of the data interact in the process of developing an overall understanding and an emerging theory. Analysis and interpretation are both continuous

How the broad headings were developed for the analysis

In order to align the analysis to the aims and hypothesis, the analysis was organised into three 'big' themes. Those themes were taken from the hypothesis. The hypothesis was constructed as a way of representing the main activities of higher education. Those big themes were:

1. Learning
2. Teaching
3. Research

The 'learning' theme is construed as an individual level of the Shared Thinking technique. Specifically, this is an inquiry into the affective and psychological impact of the technique. The 'teaching' theme is construed as a social and structural level of inquiry. Specifically, this is an investigation into the processes that combine to define the Shared Thinking

technique in the classroom. The ‘research’ theme is construed as a way of inquiring into both the individual and teaching levels of implementation.

How the sub-headings were developed for the analysis

The sub-headings within the above three ‘big’ themes, were drawn from the literature on classroom technologies. This was not necessarily the literature on the specific technologies used in the Shared Thinking technique. This was because the conventional use of electronic voting systems is for a tutor to set the questions and for students to respond using the voting handsets. The Shared Thinking technique is an innovation relative to that conventional use and it more closely connected to the literature on other classroom technologies. That literature is mentioned below.

The sub-headings used for organising the data were drawn from the work of Walter Stroup and his colleagues (Stroup 2002; Stroup, Ares et al. 2004; Stroup 2005; Stroup, Ares et al. 2005; Penuel, Abrahamson et al. 2006; Stroup, Ares et al. 2007; Carmona and Dominguez 2008; Hegedus and Penuel 2008; Ares, Stroup et al. 2009). They had used technology in the classroom in a way that emphasised the generative approach facilitated by the use of various devices.

They also noted the way that their use of classroom technologies appeared to infuse the classroom with identity (Hegedus and Kaput 2002; Hegedus and Kaput 2003; Hegedus, Kaput et al. 2007; Hegedus and Penuel 2008). In this regard, identity is an issue that emerged from both the review of the socio-cultural theory in chapter two and the review of the classroom technologies.

Stroup and his colleagues described an approach that had much in common with the Shared Thinking technique I had developed. Both were participant led and both involved being able to work at whole-class as well as small group levels. Both involved aspects of

management of interaction through different activity structures (Stroup, Ares et al. 2004; Stroup, Ares et al. 2007; Carmona and Dominguez 2008).

In addition, the conventional use of voting technologies in the classroom involved tutors setting questions for students to respond. Despite various developments with the use of audience response systems, such as the addition of student discussion (Mestre, Gerace et al. 1996; Crouch and Mazur 2001; Beatty, Gerace et al. 2006), I felt that Shared Thinking had more in common with Stroup's use of other technologies. For this reason, I used the sub-headings derived from the work of Stroup and his colleagues in Mathematics and Physics as the sub-headings for analysing the data (Stroup, Ares et al. 2004; Stroup, Ares et al. 2005; Stroup, Ares et al. 2007; Carmona and Dominguez 2008).

From this re-organisation of the data, the three big themes served as an initial category to sort the data. The data was then further sorted into the sub-headings. This provided a way of conducting an analysis across the individual case-studies. These sub-headings are: The features of the practice discussed in that literature are used here as an organising framework for the analysis of the case studies in this thesis. I am using them to guide my investigation with the understanding that they constitute temporary 'positions' on my practice that may change over the course of this thesis. These features are as follows:

1. Individual thinking relative to whole-group interaction (**Individual level**)

- The possibility of cognitive change through perspective-taking
- There are emotional benefits from sharing and dialogue with others
- Greater socialization is facilitated by dialogue and interaction.

2. A New Whole-Group Pedagogy (**Pedagogical Level**)

- Participants work in a whole-group enquiry
- The start and end is unknown and determined by the interaction of those involved (Stroup, Ares et al. 2007)
- Participants are caused to talk and listen to each other (Rinaldi 2005)

- The tutor's role is to orchestrate the interaction and manage the shift from small group to whole group and back again.
- The tutor's role is also to support the development of a shared and situated understanding of the issue
- The tutor's role is to listen as much as to talk
- Technology is used to generate and display a shared situated understanding. This shared understanding needs to be valid as representative in terms of detail, issues and participation. It has to be plausible.

3. A New Research Method for Collective Investigation (**Research Level**)

- A way of investigating the student experience at the collective level
- A way of exploring a comparative view of collective level data
- A way of involving participants as action-learners

At the same time, this allowed each case study to be self-contained. This meant that each case study had its own aims as a particular instance in which the Shared Thinking technique was implemented. The case studies had different features including different applications, different numbers of participants and different situational constraints.

I sought to understand each case study relative to the application which is why each appears as a free-standing inquiry. Each case study also plays a role within the larger inquiry into the technique. It was important that the Shared Thinking technique was understood in a naturalistic setting in order to understand and investigate its pedagogical and theoretical dimensions.

The specific processes used to analyse the data

The goal was to understand the Shared Thinking process and to develop a theoretical account of how the process related to learning theory. I therefore decided to use the

structure of the 'core' process as a structure for conducting interviews. It also seemed appropriate to use that same structure to organise the analysis. As such the data-gathering and the data-analysis were aligned to each other.

The data, from various sources, was initially sorted according to the core structure of the core Shared Thinking design (individual work, small group work, creation of the list of options, individual voting, the display and the follow-up activity).

Weft software was initially used for qualitative data analysis. This was seen as a useful way to create categories and prepare the data for analysis. Weft is free qualitative data analysis software available online (www.pressure.to/qda). The use of this software provided a container for different parts of the data set. It also allowed a view across each case study and the possibility of comparing one with another.

Consistent with the structure mentioned above, the three big themes were used as main categories in the software. Within those themes the sub-headings were added from the literature on classroom technologies also mentioned above.

After trying the use of analytical software, I decided that it was practical and more useful to adopt a close reading approach. This made sense for the relatively small number of interview transcripts. It was easier to read and re-read the transcripts on paper and to let themes emerge from a grounded view. This was also supported by a constant return to the literature as those particular themes emerged.

9. Conclusion

This chapter provided details of how the investigation was framed and the research methods used in this thesis. In addition, the data gathering tools were described along with details as to how the data was analysed.

A case study approach was described and specifically the use of the semi-structured interview technique was detailed as the main tool used. The initial use of the core structure of the learning design was described as a way of initially sorting the data. The use of a three level framework, based around the hypothesis, was used for a final organization of the data following a close-reading and also shaped by continuing reading of the literature related to emergent issues. The final categories, from the hypothesis, were the Individual level, Pedagogical level, and Research level.

In the following five chapters, each provides details of the different ways in which the Shared Thinking learning design was implemented. Each serves as a case study in this thesis. Each chapter also provides information on specific research methods used to investigate particular issues and/or to allow for particular circumstances.

Chapter 5: Case Study 1 - Induction and Transition at a New University

1. Introduction

This case study proposes the idea of students developing question-options in order to identify and communicate their concerns on arrival at university. In this instance, the idea was applied to both induction and transition using a Shared Thinking approach as outlined in chapter 1.

Socialisation plays an important part in the way that students settle into a university. This has an impact upon happiness and academic performance. There is evidence to show a relationship between those failing a course and those with few friends. Impoverished social relationships can mean a greater tendency to fail on a course (Smith and Beggs 2003; Krause 2007; Yorke and Longden 2008).

Tinto's theory suggests that greater social integration will increase student retention (Tinto 1995; Tinto 2000). This includes the idea of greater integration into the institution. It also includes the goal of greater integration into the subject-discipline, via the course (Draper 2008).

Social integration into the institution is typically addressed through the provision of various sports and social groups. Students are introduced to many of these during Fresher's Week as part of being inducted into the institution.

Subject integration is usually addressed through formal introductory sessions, soon after arrival at the institution. Such provision might include an overview of the course, available support and the structure of the syllabus. This may be complemented by a series of

presentations from different stakeholders such as tutors, support staff, senior management and student's union representatives.

Support is often available to those who ask but many students do not ask for help or they ask too late (Smith 2004). This may be to do with students being unsure of their needs or that they struggle to articulate them to others. It may be that they're encultured into a dependency model of learning. A background in which scaffolding was high (such as in schools) may mean that students are often ill-prepared for independent study and university life (Laing, Robinson et al. 2005). This implies the need for a culture-change when new students arrive.

One solution may be to develop a learning community approach to support and development. The value of creating learning communities as a vehicle for mutual support has been discussed in the literature on first year experience (Tinto 1995; Tinto 2000). This includes the idea of creating an atmosphere of support, fun and informality (Tinto 2000). The increased popularity of learning communities as a pedagogical strategy for first years is noted as being diverse, both in form and structure (Harvey, Drew et al. 2006). However, the effectiveness of this strategy has yet to be proven (Harvey, Drew et al. 2006).

One aim of this case study is to explore the value of the Shared Thinking approach for the development of learning communities at induction. I am also interested in the idea of leveraging the knowledge within any emergent learning community. Such an approach may help to build social capital and create a shared resource for each new arrival.

Reflecting with others may offer significant advantages over working alone (Castle and et al. 1995; Knights and Sampson 1995; Buckley 1999; Gimbert 2000; Gwyn-Paquette 2001; Nicholson and Bond 2003; Hawkins and Irujo 2004; Peel and Shortland 2004). Despite these advantages, scale, pedagogy and scheduling are factors to be considered. The cognitive diversity of the student body may pose an additional pedagogical challenge.

The tutors in this case study were open to the idea of using Shared Thinking as an alternative approach to increasing reflective practice and collaboration in the classroom. This was to begin with induction and transition.

To identify such a solution, a search was initiated to find an appropriate group-learning process. The process should be highly structured in order to make it manageable. It should be an inclusive technique to avoid leaving anyone out of the activity. It should also help unify the social interaction into a coherent form to summarise the discussions.

The snowball group discussion technique, discussed in Chapter Three, seemed ideal. The description of the Shared Thinking approach used in this case study, and detailed at the start of this chapter, is an interpretation of the snowball technique with technology added. The general approach is widely acknowledged as an effective way of including everyone in the classroom (Jaques 1984; Quinn 1988; Petonito 1991; Harvey, Drew et al. 2006).

It is also acknowledged as a lively way of expanding interaction from the individual to the collective level (Quinn 1988; Brookfield 2006). The resulting design was therefore a coupling of the snowball group-discussion technique with the use of voting technology.

2. The Case Study Context

This first case study served as a pilot for the development of the learning design. This was the first attempt to understand the design in a course context. It was a trial of both the design and of the application to induction. The context of this case study is a post-1992 university in the North of England.

This case study followed on from work done earlier with the tutors involved. I approached them to invite them to participate. I was interested in finding a site to test the initial design as a starting point for the research.

An interview with the tutors revealed a history of attempts to address concerns to do with reflective practice and peer-support. The tutors had detected that students were often using non-contact time for matters that were not always related to the course. The tutors were concerned that students were often not reflecting on the course activities. One tutor asked rhetorically:

“And have I looked at my placement and have I thought about what I could do better? It all seems to be in my perception of the student is that they’re kind of rushing and there isn’t actually a calm step back and think well what have I got to do now.” [Tutor 2]

The tutors had tried different ways to encourage a more reflective approach in the students. One example of this was the introduction of open learning materials to supplement contact-time. This was seen as a way of providing a structure for students to think about the course when they were working alone.

The tutors had also tried to support and encourage discussions about the course, with peers. To facilitate this, the tutors had helped the students form study groups. This proved quite successful but many students had difficulties organising times when they were all available. This was because the students often had other commitments such as part-time work and family obligations.

The tutors had also sought to develop peer-interaction between different year-groups at key points in the course. These included preparation for placements, at induction, and for transition. This was seen as another way of developing informal dialogue about the course.

The peer-tutoring process had some success but the responsibility to organise and deliver the sessions proved challenging to the 2nd year students. As a consequence, their interaction with the 1st year students was constrained by the tendency towards a ‘lecture and questions’ format. There was also a tendency for the participants to focus upon the most immediate part of the course. The outcome of this was that the first years did not

participate as much as they might have liked. The focus of the dialogue was also rather narrow.

It was agreed, with the tutors, that we would begin by running a session for the 2nd years. This would be followed by another identical session, this time, for the 1st years. The 2nd years' session would also function as a rehearsal to allow a small group of those students to act as volunteer mentors. We would have a 3rd session for these volunteers to interact with a group of 1st years.

The final structure consisted of 4 linked sessions, as below. An additional session was organised with the volunteers from the initial session.

1. Year 2 session for transition (with voting technology)
2. Session to prepare volunteer mentors
3. Year 1 session for induction (without voting technology)
4. Cross-Year Session (with voting technology)

3. Case Study Participants

It was agreed with the tutors that induction and transition may be an opportunity to try out the Shared Thinking approach. The hope was that this might prompt and organise reflection whilst eventually helping participants to see a value in working with peers outside formal contact time.

The participants were first and second year students on a Health Sciences course. Specifically, these were twenty-seven 2nd year students and thirty-seven 1st year students studying Physiotherapy. Two tutors were interviewed. Six volunteer 2nd year students participated in a focus group. No first years were interviewed.

4. Research Methods

The following sections describe the ways in which data was gathered and the ways in which it was analysed.

4.1 *The data gathered*

Data was gathered in the following ways:

- Audio-recorded interviews with the course tutors before the intervention
 - To understand the course
 - To identify particular issues arising for participants that might be addressed using the Shared Thinking approach
 - To introduce the research and establish the basis for participation
- Shared Thinking as a technique for capturing the collective views
 - To gather data on entering to the university
 - To gather data on starting the second year
- Questionnaires emailed to second year students acting as voluntary mentors
 - To gather data on individual experiences of involvement
- Observation Notes
 - To capture anything seen or heard as the intervention unfolded

The two tutors were contacted by email to arrange a meeting. The purpose of that meeting was to discuss the idea and any value for the intervention. I asked the tutors if they were amenable to being interviewed. When they agreed, I placed a digital recorder on the table between us. The interviews were later transcribed.

4.2 Case Study Procedure

At the start of sessions 1 and 3, individuals were asked to record their initial concerns on a piece of paper. At the end of each session, the completed sheets were collected. The issues generated by the groups were recorded on the screen. Participants then voted for their choice. In session the students voted using technology to generate the electronic pie-chart. In Session 3, the votes were recorded by typing a count of the hands raised onto a PowerPoint slide.

Students had a discussion in a focus-group format in session 2. This was also recorded on audio and later transcribed. Participants in this session were also followed up by questionnaire which was emailed to each person.

Activity Structure for Session 1

The design and structure of the first session is given below. This design was in support of transition and applied to 2nd year students on the course. This first session involved 27 Year 2 students.

A large room was provided with a series of round tables already set up. This helped to set the scene for group work and the students sorted themselves into 7 groups. Each group had between 5 and 7 students to a table.

- Introduction to session & plan
- Distribute & complete questionnaire
- Small group discussion on initial concerns at start of year 1
- Each group to select one issue to be recorded on the screen
- Small group discussion on solutions to be recorded on a blank sheet of paper and handed in after feedback to class
- Re-present first question and ask which of these concerns remain in year 2

- Ask for any additional concerns in year 2 plus any possible solutions or sources of support that may seem appropriate to be discussed in small groups and recorded on a sheet of paper to be handed in after feedback
- Present results of vote 1 & 2 on 1 slide to show development
- Request volunteers to run a similar session to year 1 students
- Thanks & close

Activity Structure for Session 2

This session lasted 1 hour and involved 6 volunteers from the first session. The activity was conducted like a small focus-group session. The conversation was structured by the issues that arose in session 1.

The goal of this session was to explore the options generated and focus upon the experience of the volunteers. In this way, the discussion would serve 2 purposes:

1. A primer for a similar conversation about these issues to follow with the 1st year students in Session 4
2. A way of identifying the options to place under each topic heading

In the event, it was not possible to draw out the final options. We realised that the 1st year concerns were also needed. Once Session 3 (below) was complete, we chose the 4 concerns that were common to both year-groups. These items were emailed to one of the volunteers with a request for them to create options for those concerns. A week later, we had the options emailed back from the volunteers.

Activity Structure for Session 3

This session brought together 37 Year 1 students. It was their first meeting of their course and it was preceded by a welcome from the course director. The introduction overran. This

left only 50 minutes for the session and, for logistical reasons, we were not able to use voting technology on this occasion.

- Introduction to session & plan
- Distribute & complete questionnaire
- Small group discussion on initial concerns at start of year 1. Each group to report back with their main concern
- Create a list of reported concerns on PowerPoint with one concern per group
- Small group discussion on possible solutions to your group's main concern
- Vote on main concerns based on the list in PowerPoint with show of hands. Record numbers for each concern
- Thanks and Close

Activity Structure for Session 4

The design and structure of the fourth session is given below. This design was in support of cross-year mentoring with the volunteers from session 2 hosting a session for the 1st year students on the course.

- Introduction and 3 warm up questions (5 minutes)
- Vote on 4 questions (40minutes)
- For each vote, show the results in a pie-chart and then invite the mentors to give a reaction and share experiences
- Those being mentored may comment, respond, ask questions or just listen before moving on to the next question
- Answer Evaluation questions with no follow up discussions (5 minutes)
- Give 10 minutes to re-load 4 questions. Invite the 2nd years to mention any key point from the year or to invite comment or questions from 1st years to 2nd years
- Go straight through the 4 votes with no feedback (5 minutes)
- Showed them the list of top topics reported by both years side by side (2 minutes)
- Close and thank everyone

The reader should also note that this session had only nine participants. The other sessions were timetabled and the students had no option but to attend. Those sessions were for

induction and transition. This fourth session was offered as a voluntary option on a specific time and date. In the event, this clashed with other timetabled commitments for many of the first year students. As a result only a few were able or chose to attend.

5. Data Analysis

The approach used to analyse the data is described in detail in chapter four. Three levels of impact were used to structure the analysis. They are:

- The Individual Level
- The Pedagogical Level
- The Research Level

5.1. The Individual Level

The reader should note that not all features are discussed at each level or for each case study. This is because each case study did not generate data for every category. It is only by putting the case studies together that we anticipate a more complete picture of each level. The individual level features are that the use of a Shared Thinking approach will support:

- There is a possibility of cognitive change through perspective-taking
- There may be emotional benefits from sharing and dialogue with others
- That more dialogue and interaction will enhance socialization

There is a possibility of cognitive change through perspective-taking

Tutors in this case study also suspected that students may be unaware that they had support needs.

“Or maybe even creating an awareness as to what their needs are...because I think half of them don’t actually know that they’ve got a need...it could be...increasing their self-awareness – that’s obviously what’s lacking”

[Tutor 2]

The challenge was how to raise students’ awareness of issues that may be important for them, but also be unrecognised. It may be that students benefit from an understanding of their perspective relative to those of their peers (Cobb and Yankel 1996; Cobb and Bowers 1999; Cobb and Hodge 2002; Doyle 2003; Engle 2006). Through an appreciation of how others thought and felt it may give each participant a new perspective on their own situation.

Participation appeared to cause some of the senior students to be reflective about their own situation. There was also some evidence to suggest that the 2nd year students developed empathy towards those they mentored.

“I know I would have personally benefited from such an experience and would like the 1st years to have the option of having it and asking me questions and for advice.” [Year 2 student 3]

“It was really useful to me to see how we could help the 1st years, and that they wanted it, but also as a second year to remind me of what I can do to help guide my learning” [Year 2 student 4]

Based on the above, one way of prompting self-reflection could be to become involved in mentoring others. Dialogue and interaction across different year groups may prompt mentors to re-visit their own earlier experiences on the course.

It seemed that the mentors had a kind of yearning for a more social and conversational form of support when they reflected about their own situation. It seems to cause them to project forwards as well as to reflect on their past.

“I felt that as a first year, these kind of sessions would have really benefited me both throughout first year and starting second year.” [Year 2 Student 5]

I would have liked to have had the opportunity to have a system such as this mentoring scheme with the year above as well.” [Year 2 student 2]

The students appeared to reflect on the ways in which such a process might have helped them develop. The quote below suggests that the process might help them to develop particular skills.

“I think it would benefit myself in terms of developing communication skills and talking to large groups.” [Year 2 student 3]

This limited data suggests that interacting with others this way may cause the mentors to reflect on their own development. The second year students appeared to reflect on their own immediate needs and their possible future needs. It also appeared to prompt an awareness of how others might play a similar role in their development.

Participants also seem to enjoy and wish for a social way of learning together. Implicit in this is a desire for a conversational approach to development. This seems to give rise to a desire or willingness to help others.

From this, we have an idea that the process prompts self-reflection and a sense of the different ways in which they reflect. This includes temporal aspects as they reflect on their past, present and future. It also seems to cause some to reflect on different ways they may have used the available sources of support to help their learning. There was some evidence to suggest the volunteers reflected upon different sources of support.

“I learned that I should have utilised the services available to me, Writing Support in particular, but also using the [department] facilities more for practical hands on practise. I also wish I had used my Academic Tutor more to resolve any issues I came across.” [Year 2 student 2]

We know that each student brings different backgrounds and different experiences with them as they enter university. We can see from the quote below how views and experiences from the past may inform contemporary perceptions of personal ability and the need for support.

“I thought that I didn’t need it because I did English at A Level so I know how to write but it’s such a different style” [Year 2 student 2]

We may wonder how these perceptions might be challenged or checked. A reflective approach may help the given student appreciate distinctions between school and university. The challenge is to encourage or even to cause that re-evaluation. It may be that a dialogue and interaction with others can help prompt reflection that may lead to the recognition of a particular need.

It is easy to imagine that students entering university might be overwhelmed by the variety of social activities. Offers of help from the university may compete with the wish to make friends and fit into the social environment. The quote below hints at a lack of trust or belief in some offers of support. Alternatively, the student may have insufficient knowledge to be able to judge the extent of their need for support. There was a suggestion that this may have an impact upon their take-up of available support.

“And at that time as well there were lots of other things that we didn’t really want to be at like computer induction so it’s just seen as ‘another’ one that helps’ us.”[Year 2 Student 5]

There are a number of issues arising from such comments. The first may be the timing of support. When is the optimal time to offer advice in such a way that it will be understood and acted upon by students? Students may have a yearning to fit in with others on their course. At the same time they may not be aware of their needs. In addition, they may struggle to distinguish an offer of available support from a personal need for that service. It may also be a question of belief in external/official messages about support.

The above data seems to suggest an appreciation and a yearning for social approaches to reflection. Such approaches may help to facilitate socialisation into the institution by supporting reflective conversations amongst those on the same course. It seems that a relational approach to sharing concerns may also prompt self-reflection which includes a re-appraisal of the ways in which available support might be better used.

In this respect, we could suggest that by supporting dialogue and interaction amongst the group, and across different year groups, we may be able to develop self-reflection whilst helping to build social capital. There is a hint in the data above that some students may neglect direct offers of help for various reasons. At the same time they appear to re-evaluate their use of support services as a consequence of reflecting with peers.

There may be emotional benefits from sharing and dialogue with others

There appears to be anxieties about coping with study. The quotes below suggest that some of these may be reduced by having a conversation with others that have been through a similar experience. Tutors have not been through the experience of being a student on the current version of the course. This means that a conversation with peers may be qualitatively different to one with tutors or support staff. For this reason the outcomes may be different.

“The small worries and feelings of being overloaded with work could easily be helped with talking to someone who has been through it and come out the other side!” [Year 2 student 1]

“It’s just reassurance” [Year 2 Student 4]

Without those conversations, students may carry the belief that they are the only ones having a particular concern. This may be one cause of some of the anxieties mentioned above. A relational approach based on discussions and sharing concerns seems to reduce stress by establishing a shared sense of having things in common.

“The ability to help relieve what seem like huge worries and problems, but when shared and talked about, realising that everyone has the same worries and that they are easily solved.” [Year 2 student 1]

“I realised other people had the same concerns and apprehensions as I did” [Year 2 student 3]

“It is interesting to hear other people in the same situation having the same opinions and issues, and it made me realise I am not alone.” [Year 2 Student 2]

Discovering that others have the same concern appears to reduce the emotional impact of the problem. This indicates some emotional value in an approach based on sharing concerns.

It also seems that the way that others feel can have an effect on the way an individual feels. In this sense, development and support seem to go beyond individual or psychological boundaries.

The quote below provides further evidence for the idea that peers seem to influence the thoughts and actions of others. This influence seems to extend to the avoidance of available support whether or not it may be needed.

“I think also that although the lecturers did say through the beginning of last year there’s writing support to help your writing essays and student advisers to help your financial things but I didn’t use them because I thought nobody else would...” [Year 2 student 4]

This suggests that the take-up of available support may not be solely determined by the quality of the service or the way in which it is marketed. Regardless of the level of

resource within a given service there is a suggestion from the quote above that peers influence the decision to seek help.

This limited data suggests that feelings are an important part of the process. Feelings and thoughts seem to be influenced by peers and perceptions of the views of peers. These thoughts and feelings influence the utilisation of support services and this may have implications for students achieving their potential.

That more dialogue and interaction will enhance socialization

In the above sections, I have begun to suggest a case might be made for a relational approach to induction and transition. This is based on the way that thoughts, feelings and actions appear to be influenced by peers through discussion and interaction. The quote below suggests that opportunities for a social approach to learning may be scarce.

“... it was good we were able to discuss things within ourselves. I hadn't discussed such things with any of them before so it was nice to finally talk about it.” [Year 2 student 3]

The above quote comes from a 2nd year student. It suggests that students seem to have relatively little to do with each other during their formal education. This seems remarkable considering how much time they occupy a classroom or lecture theatre together.

This failure to organise learning as a social enterprise for the class may be a consequence of an epistemological framework that views learning as an individual responsibility and organizes learning and teaching accordingly.

This case study hints at the way this social intervention may provide opportunities for socialization that may also provide a relational approach to development. It also throws

some light on the possible sense of isolation experienced by students. This may have adverse consequences for both development and mental well-being.

Review of Features for the Individual Level

We began with the concerns held by tutors that students were not reflecting in sufficient depth. The tutors felt that the students failed to recognise the value of reflecting with peers and that some students may be unaware that they have need for support.

The limited data discussed here suggests that by organising a dialogue and interaction to do with concerns students were prompted to reflect on their development and the ways in which they used support services.

Allied to this, it seems that developing a relational approach to may contribute towards the development of socialisation into the university through the establishment of common ground. This awareness seems to develop through dialogue and interaction giving rise to additional benefits such as a reduction in anxiety and a review of individual use of available support.

In this respect, the concerns of the tutors mentioned at the start of this section seem to be addressed in this approach. In addition, it seems that there may be a yearning for a more conversational and social approach to learning and reflection. At one level, this may be for an enjoyable approach to learning. On the other hand, it may also be more productive than reflecting alone when personal misperceptions may prevail.

The data was limited and had little depth. There is not enough detail here to draw firm conclusions. More data and further cases are needed to verify and detail such claims. More data is needed for the first year students' perspective and more information is needed to be

able to distinguish between the initial use of the Shared Thinking process and the subsequent activities.

5.2 The Pedagogical Level

The aim of this section is to explore the idea of Shared Thinking as a form of whole-group inquiry. This should mean that participants working together as a learning community (Hord 1997; Hord 2007; Hord 2008; Hord 2009) in which there is a culture of sharing ideas and mutual support (McConnell 2000; McConnell 2006). The achievement of these goals would be supported by the use of interactive classroom technologies which include electronic voting systems and interactive whiteboards.

Features of the Pedagogical Level

The reader should note that not all features are discussed at each level or for each case study. This is because data was not gathered for every feature in each case study. Based on work done elsewhere, using handheld devices in mathematics (Stroup, Ares et al. 2004; Stroup, Ares et al. 2005; Stroup, Ares et al. 2007; Carmona and Dominguez 2008), the technology-rich classroom should include at least some of the following features (expressed as features below):

- Participants work in a form of whole-group inquiry
- The start and end is unknown and determined by the interaction of those involved (Stroup, Ares et al. 2004; Stroup, Ares et al. 2005; Stroup, Ares et al. 2007)
- Participants are caused to talk and listen to each other
- The tutor's role is to orchestrate the interaction and manage the shift from small group to whole group and back again.
- The tutor's role is also to support the development of a shared and situated understanding of the issue
- The tutor's role is to listen as much as to talk

- Technology is used to generate and display a shared situated understanding. This shared understanding needs to be valid as representative in terms of detail, issues and participation. It has to be plausible.

Figure 1 below provides a diagrammatic summary of the pedagogical design structure. I have called this a psychosocial learning design for the way it seeks to build and utilise social capacity. This is a form of design pitched at the collective level rather than just the individual level of learning. The design is based on the idea of interdependence, capacity building and multiple starting and finishing points.

Figure 1: Social Identity Model of Learning Design

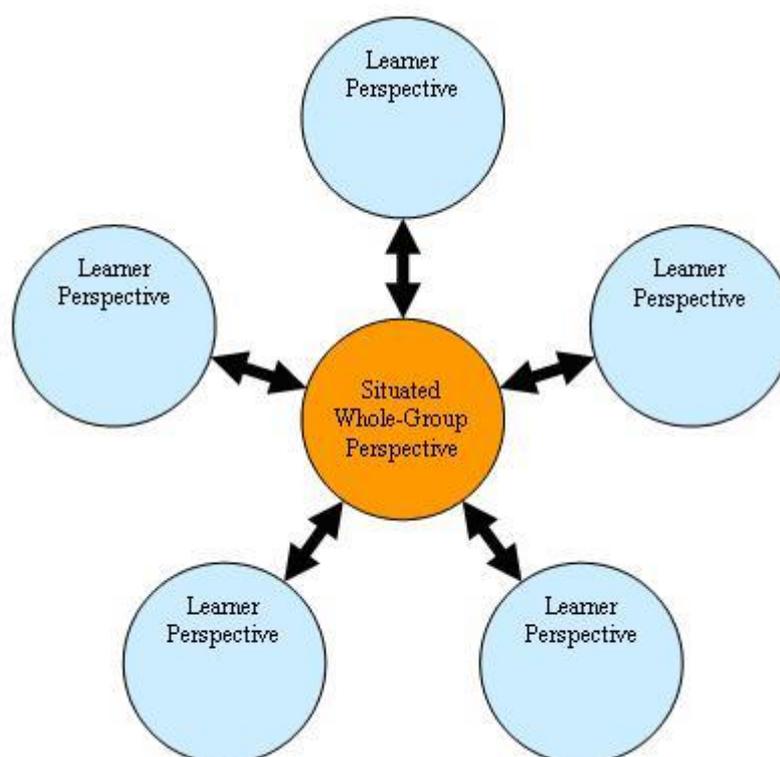


Figure 1 above is retrospectively illustrative of the psychosocial design process in practice. It is illustrative of the open-ended nature of the activity and one that explores the different “*forms of reasoning*” available within the room (Stroup, Ares et al. 2004).

The goal of the Shared Thinking approach is not to achieve a specific outcome but to explore the reasoning of the students as a learning resource for members of the group. This diagram is taken as an illustration of the two interdependent pedagogical principles pertaining to the psychosocial design process. One of these is social and the other psychological.

Participants Work in a form of Whole-Group Inquiry

This initial case study served as a pilot. Most attention was given to the structural issues and the management of the process. Consequently, there was an oversight and a failure to obtain interview data from the students. Despite this, there was some evidence that the session was experienced as a cohesive experience.

“A brilliant, feel good experience, where it seemed both groups got much from each other” [Year 2 Student 1]

More research is required to understand the exact nature of this response but there is a suggestion of an affective outcome and a level of rapport between the different groups.

The Start and End is Unknown and Determined by the Interaction of those Involved

In the first two sessions, the students were provided with the initial orientation framework in the form of an open question. This gave a shape to the dialogue and put a boundary on the conversation. The exact nature of the issues generated and the outcome of the votes were completely open and the specific items generated by the groups were not known by the participants beforehand. This was despite these issues being broadly predictable for the tutor.

This may be a significant distinction if students perceive a tutor's question as rhetorical. They will understand that the tutor already knows the answer. For the students these may

be authentic issues generated from their own experience. It seems reasonable to suggest that there is support for this feature.

Each individual was free to vote according to their own view. The vote was anonymous. In this respect there was individual agency. Equally, the display aggregated the views resulting from the dialogue and interaction. This whole-group product also influenced the individual members of the group. As such there is a suggestion of both individual and collective agency in the Shared Thinking process.

Participants Talk and Listen to Each Other

There was evidence to support the view that participants were organised so as to be able to discuss their concerns. Some of the data discussed in the Individual Level section above should also be recalled under this heading. The quote below suggests that the ability to share concerns as the basis for induction and learning was novel and rare.

“... it was good we were able to discuss things within ourselves. I hadn't discussed such things with any of them before so it was nice to finally talk about it.” [Year 2 student 3]

Group work is already a popular feature of most courses in Higher Education. Some of that group-work is organised around a readymade agenda. This session contrasts with that and is organized around the thoughts and ideas of the students.

It seems fair to suggest that, in this session, the kind of enquiry provided for these students constituted a rare opportunity to share thoughts and feelings as a basis for development. Exploring the student experience is not always seen as admissible ‘content’ for formal discussion on this course.

Tutor's Role is to Orchestrate Interaction

The feature here is that the tutor's role is seen as one involving the management or 'orchestration' of the interaction (Stroup, Ares et al. 2004). In this case, it includes moving between individual, small-group and whole-group work. The tutor needs to manage interaction across different parts of the session. In this case study, that also included management between sessions and different year-groups.

This case study consisted of 4 linked sessions.

1. Year 2 transition session (with technology)
2. Session to prepare volunteer mentors
3. Year 1 induction session (without technology)
4. Cross-Year Session (with technology)

This initial case study suggests that there may be other possible permutations. Some of these may yet to be uncovered. There are also possibilities for developing new learning activities within those structures. We might regard this as 'activity blocks' within the design.

From this first case study, there are a number of 'activity-blocks' that can serve as pedagogical tools for the tutor. They included:

1. Cycles of Shared Thinking – this refers to one complete sequence that starts with an individual view and goes through to a display of the display of the whole-group view.
2. Re-use of the artifacts – this is where the pie-chart generated from a cycle of Shared Thinking is used again. This might happen within a session or in a subsequent session.
3. Grouping (Anderson, Anderson et al. 2006) – this is where pie-charts are placed side-by-side on the screen in order to explore change at the collective and comparative level.
4. Linking different sessions – this is where artifacts are used to bridge between sessions or to connect different groups.

In this case study we used cycles, re-use of artifacts, grouping and linking sessions. All are featured in different ways. Session 1 involved a single sequence of Shared Thinking. The options generated in that sequence were re-used later in that same session. In addition, the options created in one sequence were used again as the basis for another sequence that followed. The session also 'grouped' the pie-charts from the 2 votes using the same set of options. This was done to show the level of change at the collective level over 1 year.

Session two used the options generated in Session one as the focus for a discussion amongst the mentors. These options were considered as possible discussion topics for session four. This session was also meant as a rehearsal for the mentors to be ready for Session four.

In the third session, the use of the technology was not possible due to last minute changes deemed necessary by the tutor. As such the session served as an ad-hoc 'control' for the Shared Thinking approach. The session ran through one sequence of Shared Thinking. Votes were carried out by raising hands. This was a much slower process and felt more tutor-led. It was effectively a conventional snowball technique.

Through this approach it was possible to obtain a view of the immediate concerns of the first year students. It was not possible to obtain a reliable view of the distribution of those concerns across the group.

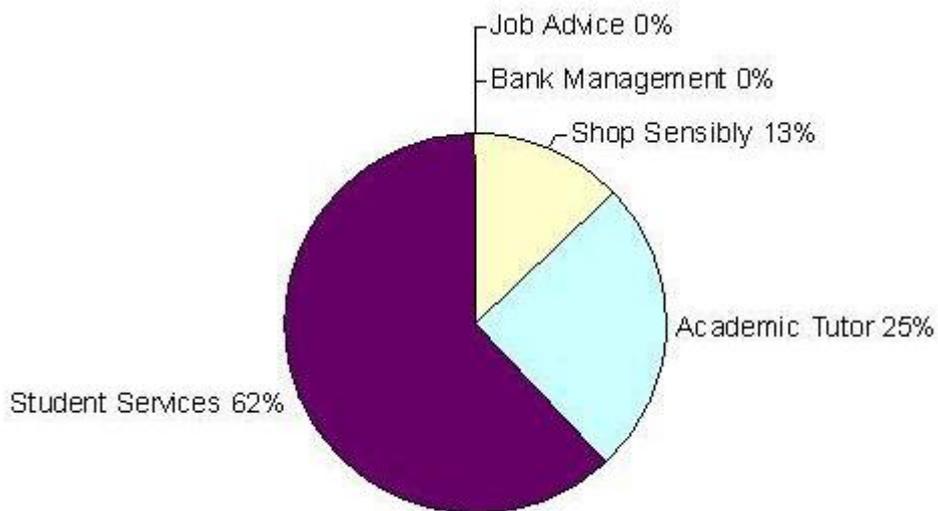
Session Four brought together the mentors from session one with a small number of first year students. The four issues that were common to both Session One and Session Three were used as the agenda. The mentors were emailed the common issues and asked to generate options for each of the four topics.

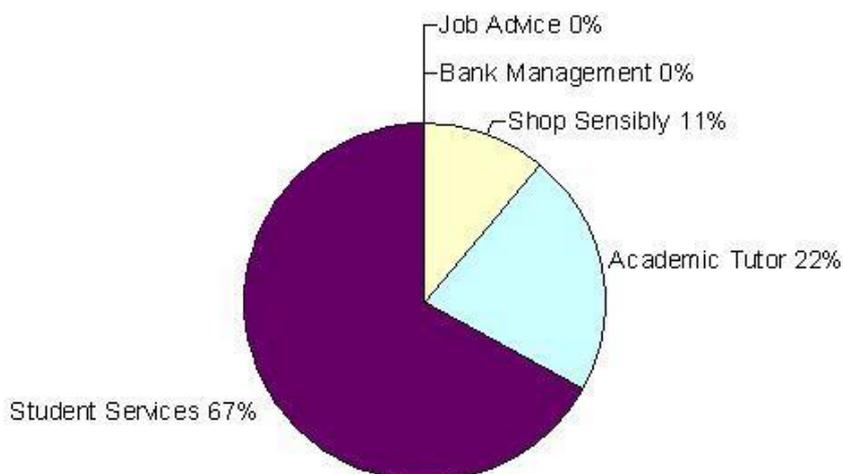
In this session a vote was taken for a topic and this was followed by discussion and input from mentors. Once all four topics were covered, the first year participants were then invited to vote again on each of them. When the voting was completed, the results of the

two votes (before and after discussion with the mentors) were then presented to the participants. This allowed us to share the shift in opinion as a consequence of the dialogue.

Figure 2 below provides an example from this final session. This example shows a small swing away from the use of academic tutors as the first people to contact and a move towards using the available support services. In the interview with the tutors before these sessions, they specifically said they were trying to encourage students to understand their concerns and to direct them at the most appropriate person. This is a small sample but nonetheless it is interesting to observe the way this session appeared to have at least partially achieved this aim. No tutors were present at this session.

Figure 2: Before and after voting results on money related problems from final session





Review of Features for the Pedagogical Level

The orchestration of the session and the management of the overall framework over the 2 week period is an effort for tutors. This was because of the way we linked different sessions and also developed different structures for the sessions.

From this case study, we have identified different ‘activity-blocks’ that can be used to help think about the design of different sessions. Some of these are generative and require students to co-construct the agenda from scratch.

The number of sequences of Shared Thinking is an issue for tutors. Some of this depends on the time available and the depth of the investigation required. This case study identified different variants that are possible within a session. The re-use of options generated in the first sequence for a subsequent activity is one example.

The re-use of the artifacts or group-products is another opportunity for the tutor. This idea of ‘grouping’ them had a dramatic effect on the session and became the focus of much interest not least amongst the watching tutors. We also did grouping in the final session to show the impact of the discussion. There are clearly a number of possibilities still to investigate with this ‘activity-block.’

Linking sessions through the re-use of group-products is also interesting here. In some respects this may have taken away an opportunity for the participants in session 4 to generate their own issues for that session. It was difficult to know whether they would feel they had already done that exercise in session 3.

I suspect that there are more possibilities for re-using materials generated from other sessions possibly as an adjunct to materials produced in a session. For example, it may be useful to compare a product produced in a class with one generated by another group. Again more work is required to explore this issue.

In each of the four sessions, the students were able to discuss their own concerns and to evaluate them as a group. As later case studies will show, students were able to use the group as a resource. They were able to participate in the dialogue and then vote anonymously. Students, in later case studies, quite often mentioned the way they did or did not follow the small group decisions. This suggests that the students had an open choice about the 'content' of the sessions.

Students did appear to listen to each other and support each other. The change in 'before and after' voting, presented in figure 2 above, is some evidence of students having paid some attention to the points made by the mentors.

Tutors were in a supporting role and listening to the issues raised in the group discussions. In the first session, we put the results of two votes together on a single slide. This showed the change across a 12 month period for the 2nd year group. At this point the tutors, attending that session, were able to intervene to use this as evidence that the students had developed. This was a response to the issues raised by the students.

5.3 The Research Level

The third level of my analysis is the research level. This refers to the way in which Shared Thinking might support the gathering of data and the exploration of particular kinds of data. This level also refers to the idea of the participants as co-investigators, consistent with an action learning model.

Features of the Research Level

The reader should note that, because of different data gathered, not all features are discussed in each case study. These features were retrospectively generated by reflection upon the initial implementation of the Shared Thinking approach with the second year group. By organizing the interaction using the Shared Thinking approach, the key features relating to the research level include:

- A way of investigating the student experience at the collective level
- A way of exploring a comparative view of collective level data
- A way of involving participants as action learners

Students, tutors and researchers all have the opportunity to see and use the pie-charts to pursue their own interests/needs. Each pie-chart is a display of the student experience at the collective level. I conceptualise these as collective biographies (Vandermeer 1980; Bucher and Manning 1998; Davies and Gannon 2006; Weiner 2008) because they are representations of collective experience at a given moment in time.

As mentioned above, it is possible to group these pie-charts. This provides a unique opportunity to explore a comparative view of collective experience. This can be organised in the class to support a wider narrative for further examination. Equally, it is possible for anyone with access to a collection of similar biographies to do compare and contrast exercises for different purposes.

Rather than seeing data being harvested by others, these sessions allow the participants to obtain a view of the data they have generated through their dialogue and interaction. This supports the idea of participants as co-investigators. Indeed the whole class, including the tutor, is organised in a form of whole-group enquiry.

The data is given a clear and communicable form within the session. This avoids the idea that a researcher or tutor takes the data away and re-presents a polished narrative back to those involved.

The Making Learning Visible Project (Bjornavald ; Surez 2006; Carmona and Dominguez 2008; Lund 2008; Ritchhart and Perkins 2008; Ritchhart and Perkins 2008) and the Reggio-Emilio Project (Rinaldi 2005) both highlight the idea that recording and documenting whole-class activity is an act of research. The Shared Thinking approach is consistent with these principles.

A Way of Investigating the Student Experience at the Collective Level

In this case study we can see how Shared Thinking might work as a research method for investigating the whole-class experience together. These representations are fascinating tools for research. They offer a quick way to sample the group-situated view on a given issue at a moment in time. In a session lasting 2 hours we were able to uncover the contemporary concerns of the year-group. The activity gave us a synthesis of quantitative and qualitative data.

We were also able to obtain a 100% response rate. Compare this to the more usual questionnaire surveys and we can see that this is more participative, it contains benefits for participants and tutors. It samples student experience at the collective level. Each of the examples given below, in the next section, illustrates this idea in different ways.

A Way of Exploring a Comparative View of Collective Level Data

The ability to compare whole-groups with one another or to compare the journey of a year-group over time is fascinating. We did both of these in this case study.

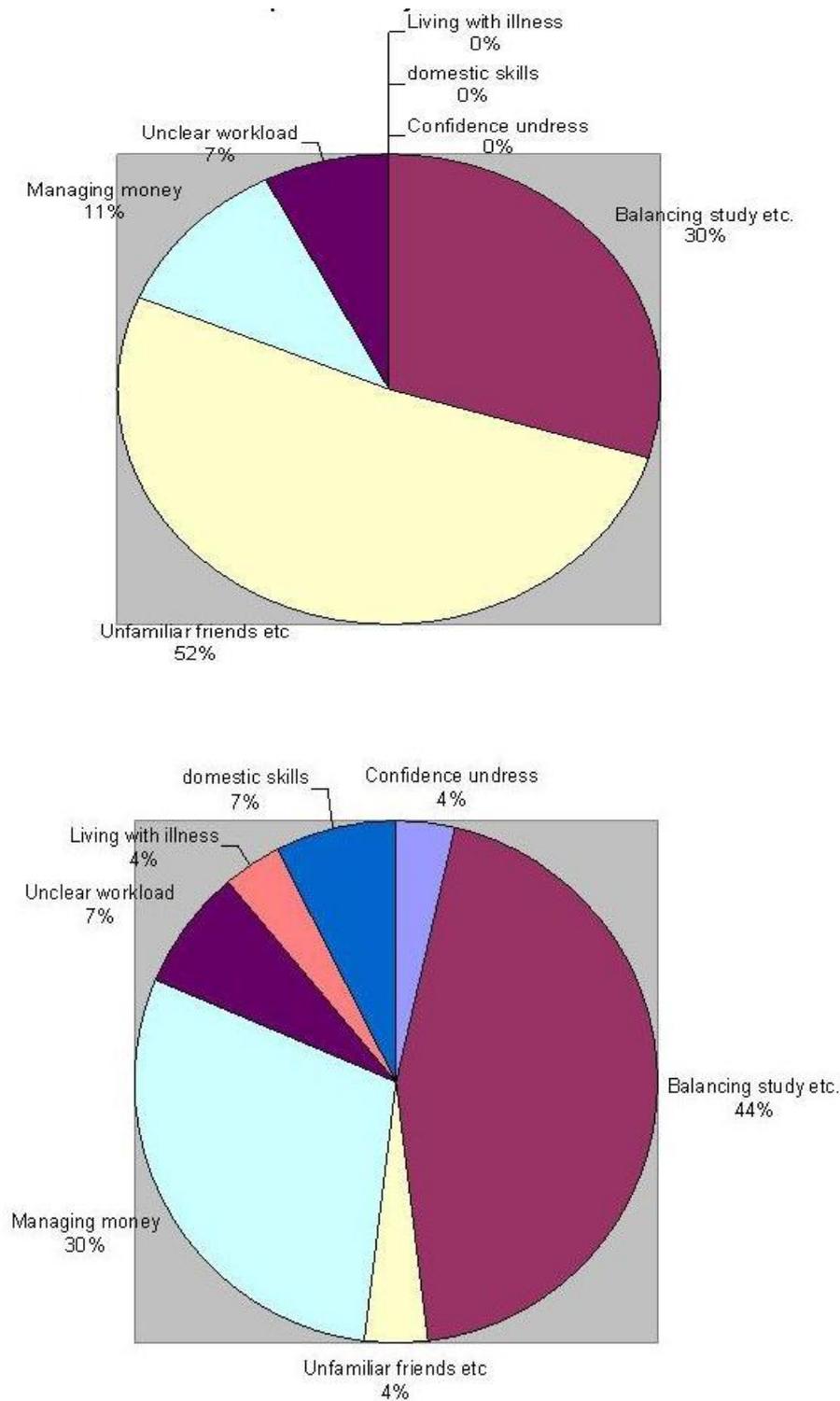
In both instances, the 2 sets of votes used the same criteria. In other words, the students generated the issues from their dialogue in one sequence and then following a discussion we ran a 2nd vote on the same issues.

Session 1: Change over a Year for the Same Group at the Collective Level

In the very first session (with the 2nd year students), we were able to explore the concerns as the students entered the university with those they had at the start of their 2nd year. This outcome is shown in the graphics below (Figure 1 and Figure 2).

Figure 3 shows the current 2nd year students looking back on their concerns as they entered the university 12 months previously. Using the Shared Thinking approach, the students generated the issues and then voted on them to produce the pie-chart.

Figure 3: Voting Results Before and After for Concerns on Entering the University Reported by Year 2 Students



We then invited the students to reflect upon the same options they had just generated. We asked them to evaluate the significance of these options a year later at the start of their second year of study. This is shown in Figure 2 above.

In that first session, we posted the 2 pie-charts above onto the same slide. This was done in order to expand the discussion and the shared investigation into the group's development over time. This effectively joined the participants into the research.

From a tutor-researcher perspective, it offers the possibility of understanding the situated concerns of a year-group in any one of these pie-charts. More importantly, it offers the possibility of understanding change in the group over the years of a course. It is easy to imagine this being done for each year of a course as one example of further work that could be done.

From a research perspective this is an example of how tutors can evaluate their course based on a view of the journey across 12 months aligned to the goals of the course (as one example). It might also be possible to compare this group with another cohort if this research was extended.

In more detail, we can see by comparing Figures 1 and 2, how much the issue of making friends has declined over a 12 month period, for example. At the same time, over that same year, the concern over money has risen significantly.

Likewise, the challenge of balancing the demands of life and study has also grown for this group over the year. This might suggest that students need more support as the course progresses.

We can do this kind of exercise for the other points raised. We can also extend this research to look at this same set of issues in the following year. So, the issue of whether to invite students to generate the view from scratch or to re-use the issues co-constructed at the start offers different research opportunities.

By comparison with other research methods, for example questionnaire surveys, this data could be gathered in 3 sessions and a total of six hours. The outcome would be the availability of collective data on the student experience for the whole course.

The efficiency of data gathering stands in contrast with other approaches to sampling or surveying student-experience. In addition, student surveys are often seen as having little benefit for the students. In this approach the activity has benefits for all involved.

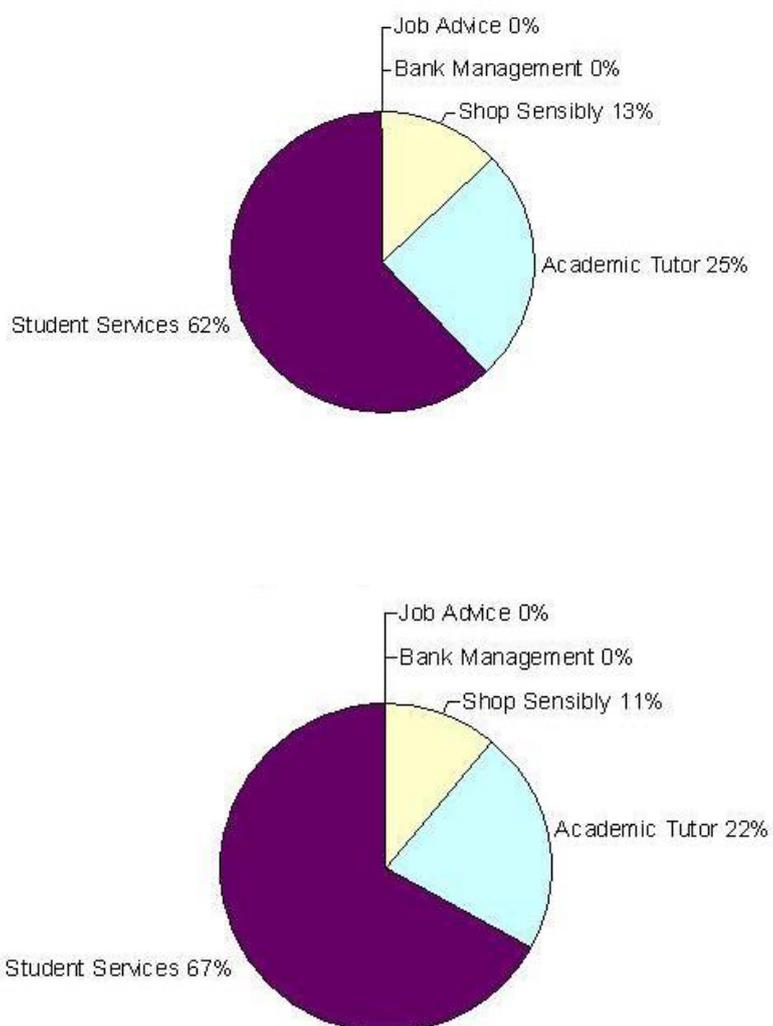
Session 4: Measuring the Impact of Dialogue with Mentors.

There were four common issues from the preparatory sessions which were finance, study/work-life, newness & friends, workload. These were the issues used as the content for the session with mentors from year 2 and participants from year one.

The results from two of the issues discussed are presented here to illustrate the research potential that might allow us to measure the impact of mentors. The first of these is to do with money problems.

The two pie-charts below (Figure 4) provide a view of the votes before and after the discussion with mentors. We can see a shift towards the idea of consulting with student services about money problems. There is a similar shift away from academic tutors as the first port of call.

Figure 4: Voting Results Before and After for 1st Years on the Issue of Solving Money Problems



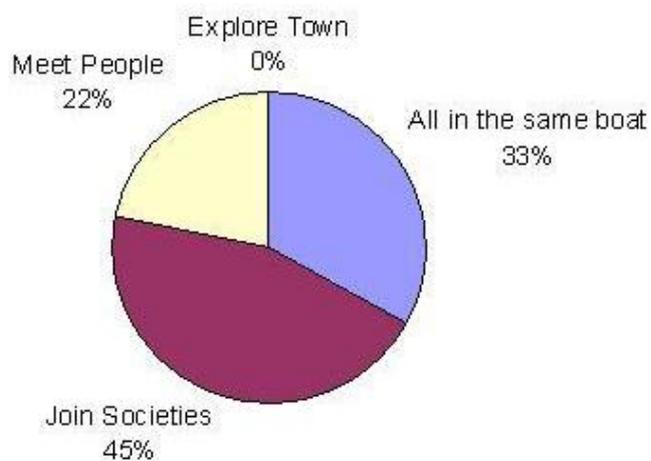
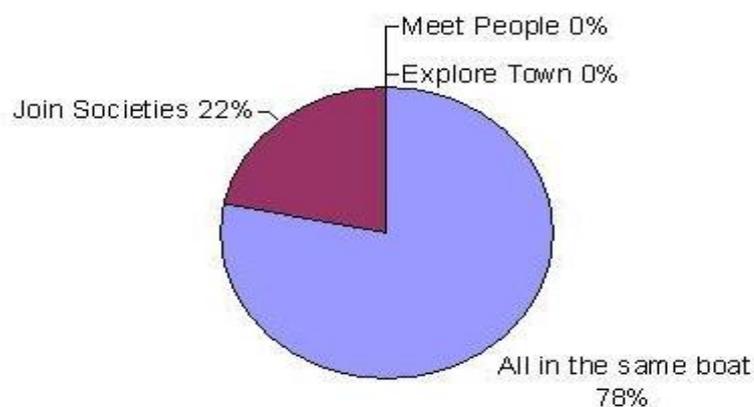
As a result of this comparison, we are able to see that the discussion with mentors appeared to have an effect. We can also get some sense of the nature of that effect and by how much it changed.

This provides us with a new way of measuring the outcome of mentoring. It also opens up a raft of new possibilities for evaluating mentoring programmes (or support programmes). The other two charts below show the results for the issue of making friends at university. Figure 5 shows the view before the input of mentors and also shows the results of the voting after the discussion with the mentors.

We can see how before the input from the mentors the overall view was to accept the situation because it is the same for everyone (something that the other data suggests they are basing on perceptions rather than knowledge).

Following the input from the mentors, we can see that this changes quite substantially and more than half of the participants see new possibilities. Again, we have a way of understanding the impact of the mentoring and dialogue. We can see which issues are most affected and to what extent they are changed.

Figure 5: Voting Results Before and After for 1st Years on the Issue of Making Friends



By grouping the results of 2 votes we can compare collective level data for the same issues. The changes show the impact of the intervention of and dialogue with the mentors.

The changes are only slight in this example. This is partly because of the small number of participants from Year 1. There were only 9 first year students due to a timetable clash.

Even so, the approach shows how we might investigate the impact of discussion and of input from others.

A way of involving participants as action learners

All of the grouping of pie-charts shown above was also shared within the relevant sessions. In this sense, it seems fair to say that the process of reflective dialogue and the visual display of their votes may well have supported a broader understanding for each individual.

The tutor is a facilitator of the development of each participant and for the group as a whole. This is a process that organises participants as action learners. More detail and data is needed to understand this in any depth.

Review of Features for Research Level

In this case study there is some evidence to support the idea of being able to use this approach to investigate the collective experience of students.

The pie-charts above show that there were different ways of showing whole-group experience by grouping them in different ways. There were different examples of the ways in which the pie-charts/products could be compared. For instance, we saw examples of how we could evaluate the impact before and after mentor interaction.

Those were comparisons using the same criteria to understand the impact of interaction with mentors by displaying votes before and after dialogue in a single session. There was also an example of using comparisons to gauge collective change over a 12 month period. Again this was using the same criteria.

The participants in the very first session in this case study were intrigued to generate a view of their discussion. They were then able to see a view of their collective journey over the 12 month period.

Equally, the tutors were also sufficiently surprised at the visual evidence of collective change and jumped up to intervene in the session at that moment. They were keen to take the opportunity to re-enforce the message about the progress made by the group.

We can consider this as a process of whole-group inquiry. As such, working with these pie-charts is, at the same time, a research activity for me and also an action learning process facilitated for the participants.

6. Discussion

This case study functioned as a pilot of the Shared Thinking design. It was a test of the pedagogical implications and the practicality of the process. It was also a test for the particular application of the process for induction and transition.

I began this chapter by looking at Tinto's idea of integration as a way of increasing retention. Integration refers to institutional socialisation and integration into the discipline via the course. Learning communities were promoted as a strategy for developing integration.

The findings from this case study suggest that induction and transition are not purely individual and psychological matters. It suggests that these events or processes are about more than the delivery of information to individuals.

There was evidence to suggest that the organisation of induction and transition, using this approach, is a social matter. How participants felt and behaved was influenced by their perception of the views held by peers. This implies that the perception of the group view may override the availability and need for a particular support service.

The thoughts and feelings of some students appeared to be influenced through the dialogue and interaction with others. These were issues that might impact upon the socialisation of the participants into the university and the course.

We do not have enough data to be able to distinguish between interaction with and without the technology. This data is also drawn from a 2nd year perspective. An understanding of the 1st year perspective is needed.

It is possible to say that there is a qualitative distinction between the use of the same activity structure with and without technology. Some of these are more objective. For instance, we are able to consider certain features which are not achievable without technology. However, there are other features which are more subjective and that need treating with greater caution.

We should add a note of caution here to say that the data is from observation notes. There is no data from either students or staff to add any additional weight to these observations. This is an area for which further research is required. Despite this, it is worth trying to make some comparisons.

The initial session delivered to the first year students in this case study was implemented without technology. The process took longer to conduct without the technology. There was not 100% participation in the voting as there was when technology was used. Similarly, the session had a greater sense of being tutor led. This was in contrast to the use of technology with the same structure. In the technology-enabled process there was also a greater sense of electricity and engagement in the room.

There appeared to be less of a sense of interaction without the use of technology. There was also a sense of a lack of engagement and a greater sense of a session being controlled by the tutor.

The session without the technology did not generate a graphical representation of the collective views of the participants. There was not 100% input by the learners without the technology. Instead, the participants generated a list of issues that were written up on a flipchart. Each participant was then asked to vote on each issue in turn. As an issue was put to the class hands were raised and counted by myself as the tutor. I would then count the hands and write the score for the particular list item.

As each was recorded, I would then move on to the next item on the list. The technology allowed participants to vote on all the items in one go. Consequently, the issues were voted upon and the graphical representation was generated all in a way which was comparatively quicker and more efficient when the technology was used. The pie-chart was shared on a large screen instead of a flipchart with hand-writing.

Without the technology the display of results could not be considered as representative. A much smaller number of participants voted. It was not possible to be certain that participants did not vote twice (or more) without the technology.

In the session with technology, we were also able to develop and then re-use the pie-charts to construct a comparative view of different experiences at the collective level. This was not possible without the technology. The ability to work with these artifacts to generate different views over time, for example, was a useful feature of the first session with technology. If it had of been possible without technology it would certainly have taken longer and the output would have remained in a list with the number of votes alongside. With the technology we were quickly able to construct a pie-chart and then work with those artifacts for different purposes. For all these reasons there was a qualitative difference even with the identical activity-structure.

We do not know enough about the impact without the technology. That session would need to be re-run with another year group. We need to gather interview data from the participants to establish the nature of their experience. At the moment, we have a comparative view of different structures and the perceptions recorded in the field observation notes. This is a largely subjective view created by my own thoughts at the time and since.

We do have a sense that the students enjoy this social and discursive approach. We also know that some students wished for more discussions. We also had some evidence to suggest that despite sharing a course, for some students, reflective conversations are rare.

The students on this course were diverse in terms of age, ethnicity, social background and work-study experience. Some were school-leavers whilst others were re-training for a second career. Many had part-time jobs to help pay for the course and some had families to maintain.

This profile is not uncommon and it makes reflective conversations difficult to organise, structure and manage. It may be that this process, once formally arranged, can be a vehicle for the facilitation of social and reflective dialogue. A relational approach also seemed to prompt self-reflection through this form of dialogue and interaction.

The tutors felt that students did not reflect on their study and their support needs enough. The tutors also felt that students did not recognise the value of peers as a source of support. From that perspective, this approach seemed to respond to those particular issues whilst raising others about how the process affects individuals and which parts cause which particular outcomes.

This case study took an initial design idea and put it into practice in a naturalistic context. The pedagogical features were explored in this case study. It showed that the initial germ of an idea may have some potential for learning and teaching. The variety of structural

possibilities was much more than could have been envisaged at the start. However, more data is required to understand this as well as the student experience of the design.

The different uses of the group-products – the representations of collective experience – were shown to be useful both in and beyond a particular session. Grouping these products has some potential to chart and explore other combinations and applications. These ‘collective biographies’ (Davies and Gannon 2006; Weiner 2008) are a resource for investigation of different phenomena and by different stakeholders (students, tutors and researchers). There is scope for exploring these artifacts and their pedagogical and research implications in other case studies and beyond.

Chapter 6: Case Study 2 – Work Related Learning for Support Staff

1. Introduction

One interesting point that emerged from the first case study was the influence others had on individual thoughts and feelings. For instance, through dialogue and interaction, some students were prompted to reflect on their own situation, on their past and also upon their ideal future. This suggested that learning support was as much a social issue as it was psychological. It was as much about peer-peer dialogue as it was to do with peer-tutor interaction.

From this, a relational idea of learning support began to emerge. Can we take this relational idea of co-located students and apply it to situations in which participants each operate in different settings?

Where does learning occur in settings which involve placements and other sites of employment? Work-related learning can be seen as located along a continuum between classroom-based and work-based learning (Lucas 2010). For any individual learner either site can be a location in which learning and teaching can happen.

Within that notional continuum, the role of the university can be seen as a provider of a safe space away from the work setting (Petherbridge 1996). Tutors might also construct a bridge between the context of learning and the context of work (Petherbridge 1996; Boud 2003).

For the accreditation provider, this raises the further issue of the overall development of academic practice for work-based learning. Such a practice needs to look across different sites of employment as each learner brings their experience to the course (Boud 2003).

What is an appropriate pedagogy for work-based learning? Could a Shared Thinking workshop offer opportunities to add to the learning that may arise from any single experience and re-locate the negotiation of possible meanings in the wider context of the workshop group? This would turn the idea of reflection into a social process (Siebert, Mills et al. 2009).

From the perspective of my research agenda, I was interested to know whether the Shared Thinking approach might be useful to support reflective practice for tutors in the national initiative. I also wanted to see whether tutors would view the Shared Thinking process as useful to support their initiative to develop reflective learners. This seems consistent with recent calls in the literature for reflective practice to be re-located within the social context of those involved (Boud, Cressey et al. 2006).

2. The Case Study Context

This case study was an implementation of Shared Thinking for a group of support tutors. These tutors were involved in a national initiative to develop reflective learners. They had come together at a conference.

Those participating in this case study signed up for our workshop which was listed on the options given to the conference participants. Participants at the conference had an option to sign up for one of several options one of which was our workshop. We had no control or influence on who was recruited.

3. Case Study Participants

This application of Shared Thinking was for a group of tutors from different institutions. These tutors were all responsible for the support of student personal and professional development (PDP).

People signed up if they were interested in this workshop. In this respect, the participants were self-selecting. There were approximately 10 people attending the workshop which lasted one hour. In the workshop the participants were divided up into two broadly equal groups. Two people agreed to be interviewed.

4. Research Methods

The principle research methods used for this case study were:

- Audio recording of small group discussions
- Voting results captured by the technology
- Questionnaire distributed by email
- Semi-structured interviews by telephone

The first case study had omitted to gather data on various aspects of the Shared Thinking process. Some of these only came to light after the event (such as the nature of the dialogue in small groups). The reason for those omissions was the concern to manage the practicalities of the session(s).

In this case study, I was concerned to redress some of those failures. I was concerned to try and gather important data from small groups and also from individuals. I was also more aware of a need to obtain a better understanding of issues that only surfaced after some reflection on the initial case study. These included the small group discussions and also the individual experience of the Shared Thinking process.

To address these issues, during the workshop, one small group was approached for permission to record their discussion. When consent was given an audio recorder was left switched on in the middle of the table.

I also followed up the workshop by sending out a questionnaire to each participant. Their names and email addresses were taken as participants registered for the workshop. The questionnaire was emailed to each individual with a request for a follow-up interview.

A semi-structured interview was undertaken with two respondents who had expressed a willingness to participate. The interview structure was organized around the structure of the Shared Thinking process (individual, small group and whole group activities). If either the interviewer or interviewee raised a point of interest then time and attention was given to that matter in order to explore it further.

In addition to this, the technology captured the votes and the display of results automatically. This provided data on the issues raised in the groups and the collective view of those issues. Both were data for this research.

4.1 Case Study Procedure

The activity structure developed for this workshop was as follows:

- Individual writes their concerns
- Share in small group
- Small group to choose key issue
- All issues to be posted to the screen
- Each individual votes for that which is most important
- Whole-Group View Generated
- Small Group Discussion of Results
- Plenary discussion
- Present data from Case Study 1
- Vote on value of Shared Thinking to help with writing
- Review and Close

5. Data Analysis

The approach used to analyse the data is described in detail in chapter four. Three levels of impact were used to structure the analysis. They are:

- The Individual Level
- The Pedagogical Level
- The Research Level

5.1 *The Individual Level*

The reader should note that not all features are discussed at each level or for each case study. This is because each case study did not generate data for every category. It is only by putting the case studies together that I anticipate a more complete picture of each level. The individual level features are that the use of a Shared Thinking approach may support:

- The possibility of cognitive change through perspective-taking
- Emotional benefits from sharing and dialogue with others
- Greater socialization facilitated by dialogue and interaction.

The possibility of cognitive change through perspective-taking

In this case study, the participants were relative experts in their role as support staff. The quote below suggests that they may be already familiar with the issues they faced in their practice. There is a suggestion that the process pulled the dialogue together from the small groups. It also implies that it was representative because it was consistent with expectations.

“No not really there weren’t many surprises. I think I always find that I tend to go to PDP conferences fairly regularly and so I always find that there’s still the continuation of engagement with issues...There weren’t any surprises but I just thought it consolidated the discussions, that I heard from the other group as well and that you’d expect to have.” [Interviewee A]

The quote below suggests that, in the minds of at least one of the workshop participants, the process articulates a sense of group identity defining the group – ‘*who they are*’ - and their collective situation – ‘*where they are at.*’ The perception appears to be that this process and visualisation might be novel for a group in the early part of a course.

“I imagine a group of first years you might have a lot of surprises. I think most of the power is using it in that context because they would tend to be more focussed on who they are and where they’re at and so they see the big picture then they understand why you might be covering a topic in a certain way for instance.” [Interviewee A]

The workshop experience also appeared to prompt participants to reflect on their own practice. Some participants related their use of the same technology to the workshop approach. This is another form of relational development. People do appear to relate their thinking and practice to that of others in the social world.

“PRS wasn’t new we’d used the technology that wasn’t new but what was new was the way that you put it together which is actually common sense but you know I like it. It’s not something I’ve thought about or in that kind of detail so I’ll definitely take that concept and put it into other work that I do.” [Interviewee B]

“Well I think it’s an extension. It’s having a dialogue. I like it. I hadn’t thought about using it in that sense and I certainly will be using it.”

[Interviewee A]

If this process does prompt participants to relate their thoughts and feelings to those of others it seems this is not always easy. For the participant below, the complexity of information and the number of options to be considered were factors in the relational activity.

“The options that we had there are clearly not mutually exclusive so I personally had difficulty thinking about ‘what was 1 and what was 4 and which one would I go for? I mean it was much more difficult than just squirrel, cat, dog or whatever it was at the start.” [Workshop Participant]

Chapter 1 of this thesis showed that perspective-taking can be a complex task. There are intra-psychological factors (cognitive and emotional processes) and inter-psychological factors (the interaction of different people involved) and situational factors (the nature of the context and its perception and significance for those involved).

Any and all of these may exert an influence on learning and teaching using this kind of approach. The technology and dialogue may support short-term memory by visualizing the dialogue. However, this external memory may not be enough to relate to more complex issues.

The emotional support from sharing and dialogue with others

In this workshop, there seemed to be a strong view of the affective outcomes of the process. The participant below seemed intrigued by the fact they had experienced an emotional response to the session. It seems as though this was a novel experience for this person, particularly in a classroom context.

“[I]n seeing other peoples’ responses I’m attaching feelings. Whether it was, well it could be feelings of alienation in the sense that everyone else put this and I put that or it could be ‘Oh I’m part of the large group. But I think you can begin to attach feelings to your thinking...I think this technology has to be used very carefully. “ [Workshop Participant]

Again we have a reference to a sense of belonging that may be induced or a sense of being outside the group. Either way, there is additional evidence for the way that learning in this approach appears to be related to a shared sense of identity. This may be an explanation for the strength of emotional response that appears to develop as a consequence of participation in the Shared Thinking process.

In this respect, the arousal of feelings in a learning situation may be indicative of identification with the group. Here the activity can be seen as generating a view of their

shared beliefs and concerns. This is a process that appears to make the beliefs for a particular group visible and then uses them as the basis for discussion. In this connection, social identity is defined by the thoughts, values and feelings of a given group – their social norms (Terry and Hogg 1996; Bicchieri and Muldoon 2011; Livingstone, Haslam et al. 2011).

This reaction may also be regarded as a comment upon teacher-led pedagogy if the idea of feelings appears to be outside the traditional view of learning. The participants in this workshop are tutors and they are not unfamiliar with group-work. Despite this, an emotional response as part of learning seems to be the source of some concern. Ironically, the experience of Shared Thinking as a process with an affective dimension may arouse feelings about its use in class. As mentioned in chapter three, there is an implicit sense that group-learning may be regarded by some as a structural matter in which individuals acquire specified knowledge in a different way.

The following quotes are an extract from the plenary in this workshop. The first quote suggests that this process is seen as a potential gauge of perceptions. This person imagines one use of the process as a barometer of understanding as new information is presented.

Participant E: “We talked about how it could be useful, depending on how you run your session or sessions, in allowing you to judge peoples’ changes in perception as you introduce more information or ideas. And we had a couple of examples where we already know that’s happening in our own institutions but that’s one of the uses of this sort of thing.”

The discussion continued and considered other possible applications of Shared Thinking. The conversation moved to occasions when it might be legitimate to use this kind of approach and times when it might not.

Participant B: “It could certainly help improve or identify a common strategy - strategy development.”

Participant C: “When you’re using it like that its entirely legitimate because if a group of people need to plan what they do, they need to work as a unit. I think it’s incredibly powerful, certainly with younger [medical] students, as an attitude change tool. I’m a bit torn about that because on the one hand I really want to change some students’ attitudes.”

Facilitator: “Does that relate to the idea of reinforcing your position? Either with the group or.....”

Participant C: “Well I think,.....if you ask a group of youngsters about something like their attitudes to immigrants and then you start feeding information in and those that have more negative attitudes actually start finding out that they’re isolated there’s going to be a lot of pressure for them to change their attitudes. Now actually you might be in the business of attitude change...”

Facilitator: “...or [for improving] patient care”

Participant C: “Yes and you want to make their attitudes more professional.”

The participants in this discussion had identified a potential application of Shared Thinking for attitude change. By this time, the discussion had turned into a consideration of the wider ethics of using this technique. This issue emerged due to a shared sense of a strong affective dimension.

The comments below suggest that the use of this technique could construe the tutor as managing the influence of peers in order to exert undue pressures on those holding particular views.

Participant A: "I think we have to recognize that what you're using is a technique that some people might have ethical reservations about putting pressure on the individual. And also you're the one that's feeding them that sort of information."

Participant D: "Yes absolutely. You know what you're trying to do and you're relying on the group to impose the pressure, it's not you that's imposing the pressure but...."

The literature on this technology refers to the emotional impact upon the audience (Caldwell 2007; Stowell and Nelson 2007; Keller 2008; Walker and Barwell 2009). The quotes above suggest that this process involves and engages with feelings as well as thoughts. There is the suggestion that tutors are managing those feelings and implicitly responsible for organizing peer-pressure. For some, this raises ethical questions. Those questions seem not to be applied to other areas of their practice which, incidentally, involved this technology and also group learning without technology.

We should also remember that any views being shared by this process were there before the activity began. This process provides a means of eliciting them before sharing and discussing them.

It seems more plausible that this Shared Thinking approach explicitly recognizes social identity as a factor. This process appears to exert considerable social influence because the group generates the issues that define them in that moment. This is done by making their current view visible to everyone in the room.

This approach appears to increase the level of identification with the situated group. As a consequence, participants also appear to attend and engage with the issues at an emotional level. This seems to be more so compared with conventional approaches using this technology. The suggestion here is that this is particularly true when compared with other

uses of this technology or other group-learning techniques. Even so, more evidence is required to support this hypothesis.

The following exchange is interesting in this respect. In this next extract, the discussants distinguish between the use of social influence for attitude change and the use of the same for learning.

Woman B: "Yes but isn't it attitude change because of knowledge and understanding"

Woman D: "You'd like to think they were but actually I think you'd be just as likely, almost more likely to change, because if you've been fed that information and you haven't changed it's much more powerful than to start thinking 'maybe they're right'"

Woman C: "That's not the sort of thing we should be advocating is it?"

Woman D: "No it's not because you're not addressing the nub of the issue you're just trying to force them away under peer-pressure and instinct as opposed to addressing actually why the thing is."

Woman E: "But I think that's what it does. It pushes you. It's the environment you create. I mean one of the ways I've used these things is to develop confidence."

Woman C: "You've got linking emotions to thoughts..."

It is clear that some care needs to be taken in the way this activity is facilitated and supported. The same would be true of any learning activity. It would seem good practice to have a safety net in place to respond to unforeseen outcomes.

The comment below is interesting for the way it acknowledges the relationship between thoughts and feelings in this process. This might be a particular way of describing the concept of personalized learning as one that engages the feelings as well as the thoughts within the learning process.

“I think you can begin to attach feelings to your thinking which I think could be a very very good thing and I’m starting to be becoming an advocate of this now and I’m thinking yes well if you can attach feelings to thinking then you’re personalizing it. You’re internalizing your learning aren’t you?” [Male tutor]

One of the comments above suggested that users of this approach would be managing peer-influence. There is some resonance in the literature on related use of similar technologies where the tutor’s role in a class includes the ability to ‘manage the focus’ (Stroup, Ares et al. 2004; Stroup, Ares et al. 2005; Stroup, Ares et al. 2007).

This session prompted different emotional reactions from participants when they see the outcomes. Some of the following comments focused upon the relationship between the participants as fellow professionals. Others distinguished between their professional group and the others to whom they report.

Participant 3: “I think it might help me think about prioritizing and where the issues actually are.”

Participant 1: “It makes me feel supported by people who feel the same we’ve all come across the same barriers”

Participant 4: “Yes I’d go along with that.”

Participant 1: "It makes you feel frustrated as well doesn't it? You've been going at this for years and yet..."

Participant 4: "Well no, I mean had the question been phrased in a positive way we could have felt elated couldn't we? Instead of the negative frame you have here."

Participant 2: "Yes it could have been things we appreciated. Then it we would have come out feeling positive about something, interesting that."

Participant 1: "I almost feel it shows contempt for us in the way it shows their reaction to all our efforts but maybe that's off the point here. I don't know."

Participant 4: "Well that's not to invalidate your answer. It's actually part of your feelings"

The sense of identity, hinted at earlier, is replicated in the above comments. Those comments display an awareness of the relationship between the participants and distinguish between them and their academic colleagues.

In the above section, one participant noted that some of their reaction might be attributable to the way the organizing question was phrased. That question was "What are your main concerns arising from your practice?" These emotional reactions might have left participants feeling better about themselves had the organizing framework been "What are the positive parts of your experience supporting PDP?" In this way, the tutor does appear to manage emotions and effectively curates the social identity of the group.

The socialisation facilitated by a whole-group approach.

In this case study, the participants were already familiar to each other. They had met on numerous occasions at similar conferences. From that perspective, they were already socialised and may have already had a sense of shared identity. Despite this, there was a general recognition and acknowledgement that the process fostered a sense of togetherness.

“There is also something rather interesting about seeing a pie-chart than words. I suppose it’s more summative in that its actually concluding ‘That’s where we are at the moment’ that does then make you think.” [Interviewee A]

The quote below suggests that seeing how the group thinks and feels could have different outcomes for individual group members. Some of these seem to be positive while others may be more harmful. This suggests that having some immediate support provided by a facilitator may be helpful in being able to respond to any immediate concerns.

Woman A: “We did feel that it could be reinforced that you are lone voice and you could feel quite separated from the group”

Woman B: “Or it could make you recognize that you are of similar minds”

Finally, the issue of reflective practice was discussed in the previous chapter of this thesis. The comment below suggests that the process can be seen as a spiralling up of the reflective process. This suggests that the process provides a structured way of widening the number of perspectives available.

“I like the idea that you’re kind of using your self-reflections there aren’t you and then you’re reflecting with peers and then you’re collaboratively reflecting with the whole group and so it’s kind of encouraging different levels of reflection.” [Interviewee B]

Review of Features at Individual Level

There was some suggestion that the process appears to articulate and induce a shared sense of identity for the group. Participants were more aware of themselves as a professional group. They were also more aware of an 'us' and 'them' situation as a consequence of seeing their dialogue summarised on the screen.

There seems to be an emotional response to this process. Participants felt this was a practical, social, ethical and psychological issue.

The phrasing of the organising question was seen as potentially important. There is a sense that facilitators might use this process to manage influence. This was felt by some to be questionable in ethical terms.

5.2 The Pedagogical Level

The aim of this section is to explore the idea of Shared Thinking as a form of whole-group inquiry. The aim is for participants to work as a learning community (Hord 1997; Hord 2007; Hord 2008; Hord 2009) in which there is a culture of sharing ideas, feelings and practices. The aim is to achieve these goals through the use of interactive classroom technology which includes voting technology and interactive whiteboards.

Features at the Pedagogical Level

The reader should note that not all features are discussed at each level or for each case study. This is because data was not gathered for every feature in each case study. Based on work done elsewhere, using handheld devices in mathematics (Stroup, Ares et al. 2004; Stroup, Ares et al. 2005; Stroup, Ares et al. 2007; Carmona and Dominguez 2008), the

technology-rich classroom should include at least some of the following features (expressed as features below):

- Participants work in a form of whole-group inquiry
- The start and end is unknown and determined by the interaction of those involved (Stroup, Ares et al. 2004; Stroup, Ares et al. 2005; Stroup, Ares et al. 2007)
- Participants are caused to talk and listen to each other
- The tutor's role is to orchestrate the interaction and manage the shift from small group to whole group and back again.
- The tutor's role is also to support the development of a shared and situated understanding of the issue
- The tutor's role is to listen as much as to talk
- Technology is used to generate and display a shared situated understanding. This shared understanding needs to be valid as representative in terms of detail, issues and participation. It has to be plausible.

Participants work in a whole-group enquiry

Learning dispositions are an important feature of productive learning (Katz 1993; Katz 1995; Katz 1999; Heron and Reason 2001; Carr and Claxton 2002; Mathews and Lowe 2011; McCune and Entwistle 2011). Following on from this, one of the ideas in the literature on the technology rich classroom is that it becomes possible for the whole class to work together in a form of whole group inquiry (Bowskill 2010). An important part of such approaches is the way that participants are organized to be collectively oriented towards the issue being considered (Stroup, Ares et al. 2004; Ritchhart and Perkins 2008).

“Individuals often are reflecting for credit or otherwise. I think I'd see it as a bit of a litmus test as to where are people. Where's the whole community here? How are we? What are we thinking about this or that? [It's] about needs and just that sort of power.” [Interviewee A]

We can think of a learning disposition as a mind-set that is inclined towards learning. We could think of it as being open to the idea of learning in a state of readiness or being receptive. This case study also saw the emergence of engagement as a theme. This term

suggests something more active when compared with having a disposition towards learning. A disposition suggests itself to be a mental state whereas engagement seems to be more involved. It could be that one leads to the other. Perhaps if we have a disposition and we are aligned towards an issue we might be more likely to engage with it.

“I always get excited when a workshop genuinely is a workshop – and that was. So it was very participative...giving us a lot of time to process and discuss.” [Interviewee A]

From the above, we might think that a certain amount of effort is required in order to be described as engaged. This idea that the Shared Thinking session in this case study was a genuine workshop suggests that participants were prompted to put a certain amount of effort into their participation and perhaps this led to a feeling of being engaged.

“It worked in lots of senses. We were doing things that required visual learning and auditory learning and a chance to chat to staff and to say what we thought and felt. So, I mean it really did engage.” [Interviewee A]

The above quote suggests that engagement might be facilitated by activity and communication through different senses. It may be that by connecting to a greater variety of senses might be more likely to result in participants feeling engaged. It could also be that by offering different routes to the information, by addressing different senses, we offer more hooks and any one of them might engage the learner.

“I think it’s, well we had 2 groups and we had different issues in different groups so you always get a sense of what’s going on elsewhere but there is also something rather interesting about seeing a pie-chart than words. I suppose it’s more summative in that its actually concluding ‘That’s where we are at the moment’ that does then make you think.” [Interviewee B]

The form of communication in the classroom may also impact upon engagement. This could be to do with the way that information is conveyed, the depth of information it contains, or how much it demands of the learner. It may also be the way it allows the learner to elaborate from their own cognitive position on the issue (less psychological noise etc.).

From what has already been said about Shared Thinking in this particular case study, it seems that the session engaged participants emotionally and cognitively. The social and open nature of this activity structure may be evidence of the formation of a particular disposition which is enabled or caused by the Shared Thinking approach. It may be that different senses, the graphical summary of the pie-chart along with the shared activity generated or enhanced engagement.

If the pie-chart is a representation of this group and its situated beliefs, and the data above suggests it may be, then it is reasonable to suggest that this graphic is an articulation of the group social identity. If the participants find the activity engaging then this suggests they are identifying with the content. This is simultaneously the co-constructed and emergent identity of the group.

Social identity theory argues that when a person is actively engaged with a particular social identity then they are likely to see themselves as a prototypical member of the group. At that moment they are indistinguishable, in their own minds, from any other member of that same group (Hogg 2001). In other words, engagement appears to equate to identification. I am suggesting that engagement in Shared Thinking, as evidenced in this case study, appears to be similar to the alignment of thought and behaviour to the active group membership. We might think of engagement not merely as participation and involvement but as depersonalization and self-categorization as a member of the social group (Turner, Oakes et al. 1994; Terry and Hogg 1996). This would be personal identification with the salient group and its identity

Therefore it seems from this, Shared Thinking may be a process that may prompt a disposition towards inquiry in the mind of a given member of the class. This dispositional state may then result in engagement. This appears to be engagement with the topic but where the content is a representation of the situated social norms of that given group then engagement is with the social identity of that group.

Consistent with social identity theory we would expect an emotional and cognitive response which would correspond to the group and its social norms in a context-sensitive manner (Turner 1975; Turner, Oakes et al. 1994). Part of this, when these norms are made visible, may be a product of the attempt of an individual to either align or reconcile their own personal schema to that of the group. Whole-group inquiry, using interactive classroom technology has been recognised elsewhere for the way it infuses identity into the session (Hegedus and Kaput 2002; Hegedus and Kaput 2003).

“I was very engaged. The group was very engaged. I don’t know if that would always be the same for all groups. That might be good info to gather.” [Interviewee A]

The start and end is unknown and determined by the interaction of those involved

The Shared Thinking session begins with a question which is set by the tutor. This question serves as an organizing framework for the remainder of the activity. Although this is pre-determined by the tutor, the exact starting point for the discussions along with the question options was open to those involved.

Participants shared their individual thoughts as the basis for the small group discussion. They generated the collective view which then provided the agenda and a shape for the subsequent discussion.

Similarly, the goal of the session was not to seek consensus. In that respect, there was no pressure to reach a particular conclusion although the participants may have had a consensus around whether or not the pie-chart was an authentic representation of their views.

From this perspective, the Shared Thinking session is open. The issues raised at the beginning, although in response to a set question, are initially unknown and determined by the interaction of those involved.

The particular issues and the way those options would be weighed in the group would not be known at the start. Some of those issues may have been predictable by the tutor but there is a sense of investigation and uncertainty. In contrast, if a tutor sets a question there may be a sense amongst the students that the answer is already known and they are really trying to work out the content of the tutor's mind.

The end-product of this case study does appear to be a representation of a particular group of PDP tutors attending a conference. It provides a view of their collective practice at a particular time. In that sense, the outcomes for that specific group were unknown at the start and end. There is sufficient data from these 2 case studies to believe that this feature is upheld. It is in the nature of the design that it is open at the start and the finish.

Shared thinking configures participants to talk and listen to each other

There is a strand of work in the educational literature concerned with the idea of a listening pedagogy (Rinaldi 2005; Paciottie and Bolick 2009). Although that literature is primarily concerned with early years schools the principles of designing learning and teaching around the idea of listening seems appealing and appropriate to Shared Thinking.

In the hour taken for this workshop, I would estimate that the presenters were talking for about twenty minutes. That was a five minute introduction, five minutes facilitating the whole-group discussion, and a further ten minutes at the end. In that final ten minutes others were participating by raising points or offering comments. This means that over 50% of the time was given to the participants having a dialogue with each other.

The participants listened to each other in their small groups. In a sense they listened to the whole group through the co-construction of the set of options and the resulting pie-chart. They were also listening to each other and talking in the whole group discussions.

Similarly, the participants were also being heard by the facilitators. The whole group is communicating to the tutor about the nature of their concerns. In doing so they articulate an agenda to which the tutor needs to respond. There was a sense, from the data, that the session was experienced as a chance to be heard by others and to hear the views of others.

“...You facilitated it well in giving us a lot of time to process and discuss... we were doing things that required visual learning and auditory learning and a chance to chat to staff and to say what we thought and felt. So, I mean it really did engage.” [Interviewee A]

The same participant compared the Shared Thinking process to their own use of voting technology. The use of discussion appeared to provide a qualitative difference to their usual practice.

“Well I think it’s an extension. It’s having a dialogue. I like it. I hadn’t thought about using it in that sense and I certainly will be using it.” [Interviewee A]

Part of listening to each other and being heard may come from allowing the participants to feel a sense of ownership of the session. It seems that participants felt a difference between the conventional use of the technology in which the answers are pre-determined by the tutor and the Shared Thinking approach in which they co-constructed the agenda. Those interviewed were asked about having the same issues presented by the tutor.

“I think that might not have worked because you’re giving us the information aren’t you and so you’re not kind of feeling a sense of ownership. I think you’d have had a strong sense of rebellion. ‘No I’m not quite sure if we agree with those’ No I think that was the better approach to get the groups to think about it. Yes I’m all for developing deep learning as opposed to surface learning.” [Interviewee B]

This person implicitly sees the conventional use of voting technology as a way of fixing the scope of the discussion and as something potentially limiting. Interestingly the above person appears to suggest that co-constructing the options is a deep approach to learning. The work of Mazur and others has marked the value of dialogue in such sessions (Mestre,

Gerace et al. 1996; Crouch and Mazur 2001; Beatty, Gerace et al. 2006). In their examples the questions and options are predetermined by the tutor.

Tutor's role is to orchestrate interaction

From the providers' perspective this session was relatively simple to manage. There were a small number of participants. They were mature adults working in different universities and they had known each other for some considerable time.

Several of them were quite familiar with the technology but had never experienced it used in this way. The time-frame for the session was limited to about 1 hour and we only went through one sequence of Shared Thinking.

Even so, there are issues in managing these sessions that require attention. For instance, the transition, between the small group work and the plenary, needs to be done smoothly. One participant, who had extensive experience of using the technology, noted the importance of facilitation in Shared Thinking.

"I mean I think for the session to work probably paramount would be the skills of facilitation. So the key message...to stress is the technology is the vehicle but in fact the skills that you need are facilitative because you're making judgments about how long to spend on a certain aspect or what might need further explanation or where for instance people are stuck on whatever the issue might be. It was a different way of approaching it which is why it was interesting. And you also, and I think this is very important, let us be for nice gaps of time." [Interviewee A]

In many respects, the facilitation of these sessions has similar characteristics to any other kind of group work. The technology does however add the issue of when to move into and out of the technology. This was something already mentioned by one of the supervisors

(Steve Brindley). Shared Thinking involves other considerations such as the number of rounds carried out in a session, the number of sessions being linked etc.

The facilitation of Shared Thinking therefore involves a mix of support for small and large group-work. It requires different ways of using the technology. It also includes managing the involvement of others (other tutors, mentors etc.).

Tutors listen to the students

These comments should be understood in conjunction with those made for feature three above. The power relationship between tutors and students appears to be changed when using Shared Thinking. One participant picked up on the way that the session configured the tutor to listen to their views. This is also consistent with the idea of documentation of classroom learning as a way of supporting a listening pedagogy (Rinaldi 2005).

“I think what you were doing was an extension and it was very much a communication. It was demonstrating that students were being listened to and heard and there was a response to that and I think that’s something very powerful. I like that power.” [Female Tutor 1]

The technology increases interaction and generates the group-situated norms

This kind of classroom technology is recognised for the way it allows participants to vote anonymously (Caldwell 2007; Simpson and Oliver 2007). Even so, it is a means of supporting interaction amongst people so it is interesting to try and understand the nature of the interaction brought about by working in this way. In this regard, there are personal factors that influence the way people vote. The comment below is one view about how decisions are informed.

“I’m not going to vote just to please somebody or to get approval. I’m just going to do it but I think in general the anonymity is one of the powerful aspects of using PRS and to know that they can be different and it’s okay.” [Interviewee A]

It seems fair to suggest that the technology facilitates interaction amongst participants. One respondent valued the structure of the session as a way of supporting self-expression and dialogue. This has echoes of the dialogical space discussed as an aim in classroom interaction elsewhere (Wegerif, Mercer et al. 1999; Mercer 2000; Mercer 2003; Dawes and Sams 2004; Mercer 2008).

“The main thing that came across was that it wasn’t necessarily about the technology it was more about...being able to verbalize each of our concerns and then being able to discuss it together and then prioritizing which ones are the most important. Just for me I can see how students could find that really useful.” [Interviewee B]

Mercer uses question stems to support dialogue amongst school children with the aim of helping to generate a dialogical space for high order thinking. It may be that Shared Thinking may do the same at the collective level through the support of interaction through the technology.

In the extract from the small group discussions given below, one participant felt this kind of approach was appropriate for some and possibly less so for others. Another participant noted the way the process helped to support a view of the diversity of thought that may reside in a classroom. However, a different participant perceived it all as rather artificial and therefore inappropriate for staff.

Participant 3: “It’s interesting because if we take this out of our context and you want to look at PDP and our issues and us as supporters and you take this into something with the students what would the effect be of that? I think it would be quite interesting. I mean would it be the same effect as for us? I’m not sure.”

Participant 2: “I personally think it’s a great way of doing some staff development sessions. That’s what I got out of it. I mean I’m sitting here thinking this is really good because well you don’t want too many moaners in a group but if you get a mixed group of people it’s really good.”

Participant 1: “Absolutely. It’s fantastic.”

Participant 2: “I think it’d be really good for that”

Participant 4: “Well if I put that in front of my faculty and said let’s all have a discussion of this or any PDP related issue they would immediately say ‘gimmick.’ You know, I think it works with undergraduates but I think people that are some way along, you know, people with PhDs and so on would look at that....”

This suggests that the strength of influence felt in this process was one issue. It may also feel managed or contrived to some. These are fair points which may be key features of the interaction when using Shared Thinking with different groups. It also calls into question the way in which other uses of the same technology appear to be ‘natural’ or without influence.

Review of Features at the Pedagogical Level

In the individual section above, I highlighted the way that feelings and thoughts seemed to play a part in the Shared Thinking approach. Indeed, the affective dimension was pulled out as an important feature in this case study.

Within this pedagogical section, I built on this and drew attention to the emerging theme of engagement from the data. I suggested that engagement was more than a disposition and that both may be part of this process. The structure and interaction appears to create a space at the collective level which has an open and social quality. This might be regarded as a collective disposition towards the investigation. We might even see it as a collective state of readiness that gives way to engagement with the dialogue and the group norms. I

have suggested that rather than seeing engagement as being to do with involvement and participation, we might see it as a process of social identification.

The Shared Thinking activity in this case study appeared to provide some support for the idea of social influence being both a feature and a pedagogical tool. To that end, I re-introduced the idea of the tutor's task as one of orchestration meaning to manage the shift from one view to another. I have also extended that to see the tutor's role as the curation of the social identity of the group. This means the idea of showing the collective jointly constructed view of the group norms from different angles (change, time, comparisons etc.).

This case study also showed the value some participants placed on the way in which Shared Thinking appears to create a dialogical space at the collective level. Rather than being a space between pairs or small groups (Mercer 2000; Mercer 2003; Dawes and Sams 2004), the Shared Thinking approach appears to create a listening pedagogy supported by technology at the collective level.

5.3 The Research Level

The third level of my analysis is the research level. This refers to the way in which Shared Thinking might support the gathering of data and the exploration of particular kinds of data. This level also refers to the idea of the participants as co-investigators, consistent with PAR as a method.

Features of the Research Level

The reader should note that not all features are discussed at each level or for each case study. By organizing the interaction using the Shared Thinking approach, the key features relating to the research level include:

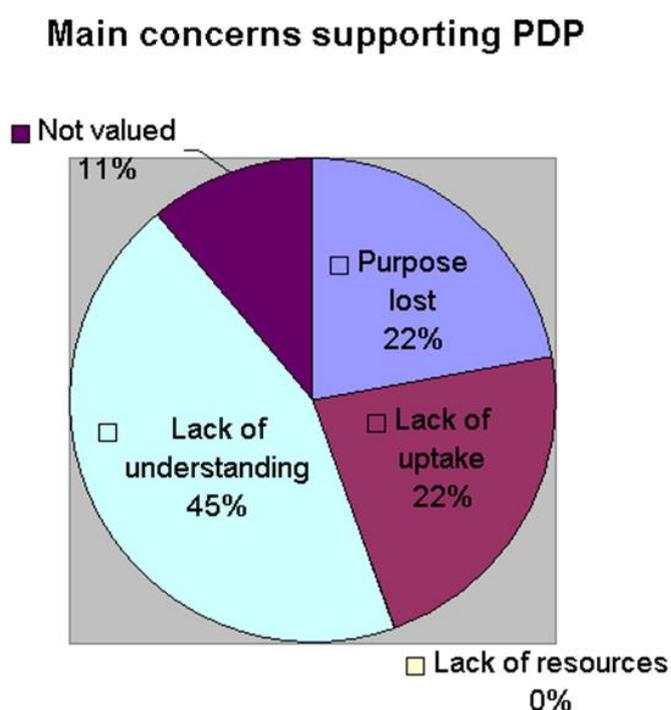
- A way of investigating the student experience at the collective level
- A way of exploring a comparative view of collective level data
- A way of involving participants as action learners

A way of investigating the student experience at the collective level

In the first case study, we were able to visualise and then explore the collective experience of the students in different year groups. In this case study, we aimed to extend this into an investigation of distributed practices.

Figure 6 below, shows the contemporary concerns of the sub-group within the wider PDP support community. These issues and their weighting were generated by the participants. There is evidence above to suggest that this is an authentic representation for this group at this moment in time.

Figure 6: Support Staff Concerns about Supporting PDP



One of those interviewed offers us some insight into the potential of these collective biographies. More specifically, this suggests a possible value for different audiences.

“Individuals often are reflecting for credit or otherwise. I think I’d see it as a bit of a litmus test as to where are people. Where’s the whole community here? How are we? What are we thinking about this or that? About needs and just that sort of power but I think this is just the start which is why it could well be others out there who are using it in the same sense but I don’t read about it.” [Interviewee A]

This same interviewee also saw the potential of this approach to document collective experience at different intervals. This person also had some reservations about the ‘objectivity’ of the document.

“What I like about it is it records something at that point in time. Which of course can vary and you may have nuances etc. I mean I’m not sure how objective the process is.” [Interviewee A]

The issue of objectivity in this thesis is determined by different ‘readers.’ As such, the goal is not to seek universal validity but ‘naturalistic validity.’ This would mean that the representation and the participative activity should be authentic to each participant in that given context. These biographies should be naturalistic and valid for different ‘readers’ in the audience.

Collective Evaluation

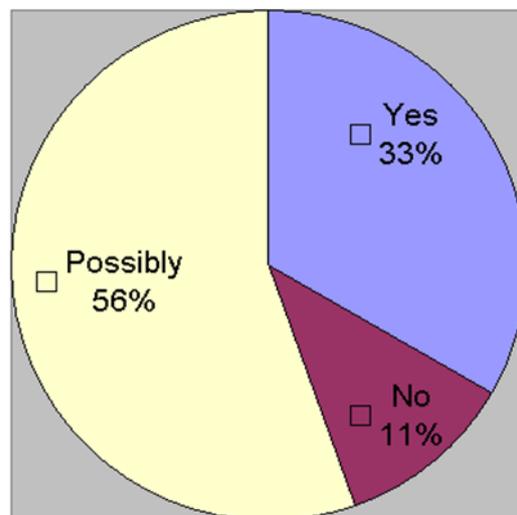
Students encouraged to adopt PDP are often required to develop and maintain a portfolio. This involves independent and reflective writing. Many students (and staff) struggle to know what and how to write in their portfolio. They have uncertainty and tensions to do with the intended audience for that writing. This is particularly so when reflective writing is to be shown or submitted to the tutor.

In designing this particular technique the idea of a conversation amongst peers was seen as a way to provide a wider perspective on individual experience. It was also seen as potentially useful preparation for writing.

At the end of this workshop, we asked the participants if they thought that this collaborative approach to reflection might help them to independently write about their PDP practice. This was intended to test the design principles mentioned above. Figure 7 shows the outcome of this vote.

Figure 7: Support Staff Opinion on the Value of Shared Thinking as Preparation for Reflective Writing

Would this session help independent writing?



There was some ambiguity in the minds of participants because of an uncertainty as to whether this exercise was a direct reference to them and the value of this specific activity to help them write. The alternate perception, and the one intended in the question, was whether they would think, having had this kind of experience themselves, that students might find a similar exercise useful for their writing.

Despite this confusion, the general opinion was that it may be helpful to participate in a Shared Thinking session if you had to do some independent writing soon afterwards. More evidence is needed to have any confidence in this view. However, there is some evidence to suggest that this kind of session might help independent writing.

A way of exploring a comparative view of collective level data

In the first case study, discussed in the previous chapter, I showed how we could ‘group’ the student-generated products to understand and explore change across time. In this session, we grouped these products in a different way.

Having given the participants an experiential introduction to the process, we then showed them how the products could be grouped. We did this to demonstrate the pedagogical possibilities for using these artifacts. We also did it in order to explore the possibility of bringing in artifacts from other sessions as a resource. We presented them with the two pie-charts showing change over a one year for the 2nd year students. These were the pie-chart generated by those students in the previous case study.

“I liked the thought as I always do of comparative data...There is something about management of data that we need to get smarter about and collecting data from the students generally.” [Interviewee A]

This interviewee related this idea to their own local practices and to the idea of collective and comparative data. There is clearly a lot more can be done to develop this as a research method.

“I think I would love to have a different kind of conversation on-going about management of learning but using the concept of Shared Thinking. I like it enormously” [Interviewee A]

This case study shows how the idea of documentation, through these collective biographies, opens up possibilities within and beyond particular sessions. This is consistent

with the work done at Harvard (Perkins and Blythe 1994; Perkins and Unger 1994; Ritchhart and Perkins 2000) and in Italy (Rinaldi 2005) on the idea of documenting learning in the classroom. This is a way of communicating back into the class and outwardly to others, interested or involved.

Review of Features for the Research Level

This case study added to the findings from the first case study. In this case study, we used a similar method to explore the collective experience of distributed support tutors. These were from institutions around Britain. We have therefore demonstrated the potential to aggregate highly distributed practices and to generate a collective view of the issues at a given point in time from across the UK.

We also showed how it is possible to use the technology in a more traditional tutor-led mode of use to evaluate issues relating to the workshop. In this case it was to explore whether or not Shared Thinking might be helpful for independent writing.

This mixed-mode approach to the use of this technology extends the pedagogical applications for Shared Thinking but also helps to elaborate the investigation of collective experience. Again, this offers opportunities within the session for all involved. Equally, it offers new possibilities for researchers to understand the collective experience and to compare different groups on the same issue or across different contexts.

This comparison helps to triangulate the data, all at the collective level, providing a view from different perspectives. In the final case study of this thesis, in Chapter 9, we asked the same question of academic staff. At the end of this thesis it becomes possible to compare and contrast the collective views of support-staff, academic staff and students on the issue of how well Shared Thinking prepares them for independent writing.

We can therefore explore the collective experience of a group over time. Similarly, we can also explore the collective experience of diverse but related stakeholder-groups on a single issue.

6. Discussion

In the first case study, we saw how individuals were influenced by others in their thinking and behaviour. This suggested that learning support was as much social as psychological. We noted that reflecting with others could prompt self-reflection. We also noted that students seemed to enjoy and wish for more reflective conversations. These were otherwise quite rare in formal settings and difficult to organize.

In this case study, it appears that a sense of group identity might be generated as part of the process. This is a sense of the group on its own and in relation to other groups. We also noted the way that feelings and thoughts seem to be a feature of this process. The use of the process to organize influence was seen as a feature that for some was ethically questionable. This might be taken as an indicator of the strength of feelings that were generated by this process. There was a suggestion that the way in which the sessions were framed could play a part in the management process.

At a broader level, I looked at this case study through the lens of work based learning. I highlighted the difficult issue of reflection as well as the tension in the relationship between the place of work and the site of learning. In this case study, I explored the idea of different tutors in their respective institutions each concerned with providing support to students for reflective learning.

I looked at the Shared Thinking process for its potential to provide a pedagogical approach that might bridge between the institution and the site of learning. I am suggesting that the process used at this conference workshop may be one way of providing a meta-level representation which may be able to look across different sites of activity and learning.

Chapter 7: Case Study 3 – Induction and Transition at an Ancient University

1. Introduction

The first case study suggested that, when using this process, others might be an influence the thoughts and feelings of a given participant. Through dialogue and interaction, participants seemed to be prompted to reflect on their own situation, on their past and also upon their ideal future.

This suggested that learning support was as much a social issue as it was psychological. It was as much about peer-peer dialogue as it was to do with peer-tutor interaction. The second case study highlighted the role of feelings as well as thoughts in this process. We also suggested the articulation of a group identity might be a feature of this process.

In pedagogical terms, the first case study provided a core structure which defined the Shared Thinking design. That case study also provided a number of variables by which the original design, used in the first session, could be modified for different purposes. We also saw the suggestion that we might organise the disposition of the group through the construction of the question used to frame the session.

2. The Case Study Context

The initial design, implemented in Case Study 1, was for a class of around 30 students. This third case study was on a different scale. There were several hundred students involved in a single session.

This scale raised issues to do with the organisation and management of the groups. How would we get the students into the groups? Having done that how would we then orchestrate the interaction amongst the groups?

Related to the issue of scale, was how we would gather the input from such a large number of groups. This problem was important because the co-construction of the whole-group perspective is central to the activity. It is the whole-group view that resources and shapes any subsequent activities.

Faculty Background

This case study took place in an ‘ancient’ university (pre-1500 A.D.). The motivation for introducing this innovation was also different for this case study. Here the aim was to move away from induction and transition that was previously based on a transmission model of learning. In the past, the faculty had deployed a series of speakers to come and give a presentation to the students. The content of the sessions was largely known to the providers from the start.

The induction provision had changed over the years to include a variety of different speakers drawn from staff in the faculty, ex-students and staff from support services. The tutors were interested in improving their provision but had not found a different model to offer a significant departure from the presentational format.

As a consequence of the discussion with the tutors, and them hearing about the success of the first case study through their role as supervisors, it was decided to adopt the Shared Thinking model.

One of the tutors made a significant modification to the original approach. This was in order to accommodate the issue of numbers. To this end, the technology was changed to an

interactive whiteboard system. The change allowed students to post directly to the screen and overcame the need for each group to respond verbally.

In this case study, Dr. Quintin Cutts, one of the supervisors for this research, was a recognised expert on computing and this technology (Cutts, Carbone et al. 2004; Cutts and Kennedy 2005; Kennedy and Cutts 2005). It was his expertise and interest in this research that meant he was able to re-structure the initial activity design to address the issue of scale. To do this, he changed the equipment from electronic voting technology to the use of interactive whiteboard technology.

Despite the numbers, the revised design allowed many students to simultaneously 'post' their concerns to the screen from their handsets, on behalf of their groups. Students used their handsets to send text messages containing their concerns onto the screen.

When the messages arrived on the screen, the tutor scanned them quickly and manually generated categories. This was a way of sorting them 'on the fly.' Those categories became the options against which the students would cast their votes.

In this case study, the handsets were used in 2 different ways. Firstly, they were used to transmit the concerns. Then the handsets were used again, shortly after, for individuals to vote on the options.

In this case study, votes were cast for each option. This was in contrast to the first case study in which the participants voted for the one they saw as most important. In this sense, the technology played a more prominent role but in such a large group setting it seemed to add to the fun with no adverse impact.

3. Case Study Participants

This case study had considerably more participants than any other. The maximum number in a single session was 350 students. The students involved were located within a science faculty. They included students from three different subject areas. The subjects covered were Mathematics, Computing Science and Psychology.

The students were either 1st Years who had just arrived at the university or they were students about to begin their 2nd year of study. Discussion with one of the tutors involved revealed that the faculty had always used a presentation-style format for induction. A total of six interviews were carried out for this case study. Four first year students were interviewed, one second year student was interviewed and one final year student was also interviewed.

4. Research Methods

Ethical approval was requested and gained for the research activity. For this case study, a document was used to facilitate individual students to record their concerns. These documents were a form of questionnaire but with a single question asking about their main concern on arriving at university.

The document also invited them to indicate whether or not they would be willing to participate in an interview with the researcher. These questionnaires were collected in at the end of the three main sessions (Year 2 students plus two sessions for Year 1).

Those that had indicated a willingness to participate in a telephone interview were contacted by email to arrange a time and to provide contact details. From those indicating a willingness to participate in the research, 6 interviews were arranged.

Telephone interviews were conducted over Skype. Each participant was briefed on the ethics of the interview, that it was being recorded and that all data would remain anonymous. Each participant was given contact details for the research supervisor should they have concerns on any matter arising or connected with the research. The interviews were recorded using a microphone held near the computer speakers. This allowed both sides of the conversation to be captured. The recording was then transcribed.

The interviews were semi-structured. The different stages of the Shared Thinking session structure was used as an organising framework for the interviews. When issues of interest to either the researcher or the participant arose, space and time was given to exploring that issue in more detail.

Data captured through the technology was also analysed. All the data was set within the structure of the session. Later the data was re-organised into the three main themes of individual, collective/pedagogical and research.

4.1 Case Study Procedure

This case study had 5 different sessions. The overall structure for this case study is provided below. See appendix 1 for the exact details.

- Session 1: Year 2 Session
- Session 2: Preparing Volunteer Mentors
- Session 3: Morning Session of 1st Years
- Session 4: Break-Out Groups for Morning Session with 1st Years and Mentors
- Session 5: Afternoon Group of different 1st Years and Mentors in a single session

Sessions 1, 3 and 5 each lasted two hours. Each of those three sessions had several hundred students involved. In the morning session, the mentors from the 2nd year group participated

in a different room. In the afternoon session, the mentoring took place in the same session/room.

Session 1: Year 2

The design and structure of the first session is given below. This design was in support of transition and applied to 2nd year students on the course. The session lasted 2 hours and involved around 150 students. The structure was as follows:

- Introduction to session & plan
- Distribute & complete questionnaire
- Small group discussion on initial concerns at start of year 1
- Students to text their groups chosen concern to the screen
- Tutor sorts concerns into main categories as options
- Students vote on each concern in a Likert-scale displayed in real-time on the screen
- Tutor responds to main concerns expressed in the categories
- Request volunteers to run a similar session to year 1 students
- Thanks & close

Session 2: Preparing Volunteer Mentors

At the end of Session 1, we asked for volunteers to mentor the 1st year students. From this, around 8-10 students were recruited from year 2. These volunteers worked together for approximately 1 hour. The session was conducted in a way similar to a focus group activity. The volunteers reviewed the issues generated in their session

In this case study, the participants were supported by the use of technology. We added the options they identified as important to the screen. As each item was agreed it was entered onto a slide. This continued until we had approximately 7 items on the screen.

As such, this preparatory or review session functioned in a similar way to the main activity. In other words, the group was generating issues from the discussion and building a view of the outcomes of the dialogue making them visible on the screen. Rather than the options being built by multiple groups this activity was generating a set of options from one group. In this case the students did not vote on the options but the research notes show that this session had a similar generative feel to the first case study.

Again, the idea for the volunteer session was that the discussion would act in 2 ways:

1. A primer for a similar conversation about these issues with the 1st year students
2. A way of identifying the options to place under each topic heading

Session 3 Morning Group of 1st Years

- Introduction to session & plan
- Distribute & complete questionnaire
- Small group discussion on initial concerns at start of year 1
- Students to text their groups chosen concern to the screen
- Tutor sorts concerns into main categories as options
- Students vote on each concern in a Likert-scale displayed in real-time on the screen
- Tutor responds to main concerns expressed in the categories
- Request volunteers to run a similar session to year 1 students
- Thanks & close

Session 4 Break-Out Groups for Morning Session with 1st Years and Mentors

- Students break into 5 groups of approximately 50 in different rooms.
- Mentors interact with 1st years. 2 Mentors for each of the 5 rooms
- Original votes displayed from the main session
- Students re-vote and mentors discuss the issues specific to their votes

Following the main session, participants were divided into 5 random groups. Each group was assigned to a break-out room. Each room had one computing student providing technical support.

During the tea break, mentors were invited to construct options for the issues raised by the 1st years. Again the idea was to give the mentors preparation and rehearsal before discussing the issues in the break-out sessions. Mentors were also assigned to one of 5 break-out rooms to deliver the mentoring.

In the rooms, the results from the main session were presented on the screen. Before the dialogue began, the students were invited to vote again on the topics. The idea was to help re-situate the discussion within the particular group.

The results of the first vote remained visible throughout. Mentors responded to the votes in each room. Following the discussion a second vote was taken. The results of both votes were then shown on the screen for all to see. Mentors added any further comments on the 2nd vote and invited any further comments from participants.

Session 5 Afternoon Group of different 1st Years and Mentors in a single session

- Introduction to session & plan
- Distribute & complete questionnaire
- Small group discussion on initial concerns at start of year 1
- Students to text their groups chosen concern to the screen
- Tutor sorts concerns into main categories as options
- Students vote on each concern in a Likert-scale displayed in real-time on the screen
- Tutors and mentors respond to main concerns in the same session
- Request volunteers to run a similar session to year 1 students
- Thanks & close

5. Analysis

The approach used to analyse the data is described in detail in chapter four. Three levels of impact were used to structure the analysis. They are:

- The Individual Level
- The Pedagogical Level
- The Research Level

5.1. The Individual Level

One idea at the heart of this study is that induction and transition should not be based upon a transmission model of learning. Students need to negotiate and construct the meaning of experience, including current experience, through dialogue and interaction.

Features of the Individual Level

The reader should note that not all features are discussed at each level or for each case study. By organising the interaction using the Shared Thinking approach, the individual level features are that this will support:

- The possibility of cognitive change through perspective-taking
- There may be emotional benefits from sharing and dialogue with others
- Greater socialisation facilitated by dialogue and interaction.

The possibility of cognitive change through perspective-taking

One of the aims in this case study was to investigate the way in which peers seemed to influence the thoughts and feelings of others. Another aim was to explore whether the process fostered a sense of identification with the group.

The comment below suggests that there were particular issues which may have influenced some participants. It seems that some individuals were prompted to re-think the way they traditionally approached certain tasks.

“Yes there was the time-management where most people say that it’s better to use a kind of electronic device on a daily basis even. Well, I have to admit that I didn’t think of that kind of way... [2nd year student]

The above comment came from within the group. This was a second year student and the session had no mentoring input from other year groups. In the first case study, we were unable to be confident about the source of some ideas. Here we can see that ideas came from within the group through the discussion and interaction. The process seems to allow for the sharing of ideas and feelings.

This limited piece of evidence suggests that as a consequence of this process the student was made more aware of alternative practices and different ways of thinking. Interestingly, the same student mentioned having gone a step further and changed his practice.

So, I know what I’m doing every week but on a daily basis I just take things as they come which is not a very good idea. So, I’ve adopted that one...and I found it was a lot more productive to plan on a weekly basis” [2nd year student]

From this perspective, we can argue that due to the influence of the group, this person changed their thoughts and practice. We do not know whether this might have happened anyway if the same student had simply been made aware of alternatives. Would that have the same outcome?

Having the right information may be sufficient as an explanation of this change. What difference does it make when the information comes from within the peer-group instead of the tutor?

One of the flaws in the first case study (chapter 5) was the lack of interview data from first year participants. This issue was addressed in this case study. The comment below came from a first year student. It describes how she was sensitized to a particular issue through her participation with her peers in the Shared Thinking activity. This was further developed by the input from one of the second year volunteers.

“...yes quite a lot of things like how exams might go and when I heard from older students how this works and how that works and I hadn't really thought of that before so that was extremely helpful ... this is something else I need to think about at university.... initially they came up on the screen and then they got developed by the mentors.” [1st year student]

This is helpful in understanding more about different sources of influence enacted as part of the process. It seems that the peer-group may have primed the individual through the articulation of issues that were of common concern. Mentors have then elaborated the issue providing further detail.

This evidence is limited and it remains unclear whether or not participants are changing because of the source of the information or because they are given information that was appropriate. Based on the initial findings in the first two case studies, students may identify with their peers and be influenced to attend that information more closely compared to information presented more directly by facilitators. More evidence is needed.

There may be emotional benefits from sharing and dialogue with others

In the first case study, there were a number of comments about the value of knowing how others were feeling. Specifically, the students were comforted by the recognition that they were not alone in having a given concern.

In the second case study, I also speculated that the process developed a sense of identity – about who the group are relative to a particular issue. Part of identification is seeing our

self in others. Recognising a shared view between individuals creates an emotional bond. We have an awareness of there being something in common.

The comment below seems to provide some support for these emerging ideas. This person describes the impact of being socially isolated. We have the suggestion that the student is able to draw emotional comfort from seeing how others feel.

“if you’re just on your own you don’t know what everyone else is thinking or if you’re in small groups you only know what they’re thinking in the small group whereas if it’s all up on the screen you can see what everybody is thinking so I think that is much better having that up on the screen ...and you can see if it’s like a large number then it will make you feel okay I’m not freaking out I’m not over-reacting..” [1st year student]

There is a sense from the above comment that the process may make a contribution towards the well-being of this student. The process seems to let them know that they are not different from the group and that they share certain worries with others. This may reduce the stress and anxiety felt by new arrivals. It may also contribute towards a sense of belonging.

In the first case study (chapter 5), one student mentioned that they had not previously been able to discuss course-relevant issues with their peers. That comment was made by a second year student on a physiotherapy course.

In this case study, we saw a similar point made by a second year student taking a science course. It seems that social isolation may give rise to uncertainty and confidence about personal efficacy.

“Well there are some close friends...I knew what they were going through somehow. But overall for the other students in the class you didn’t know because you haven’t talked about itthe technology made it possible to actually see for yourself it is true what I can see with my eyes right now. So actually it made a huge difference...” [2nd year student]

The above comment and those in the first case study suggest that conversations about thoughts and feelings are important and also quite rare. They suggest that such conversations have an impact upon the thoughts and feelings of those involved. In addition, the visualisation of these issues appears to have an impact upon well-being.

Social isolation appears to have related effects in the opposite direction. Thinking alone, or in small groups of friends, appears to be insufficient as a basis for developing a sense of belonging to the wider peer-group. Individuals may consequently be uncertain as to whether their concerns are representative of their fellow classmates.

These quotes suggest that a sense of belief about information given to the student is important. Perhaps the students are able to trust information they have generated which is also sufficiently representative of the group as a whole. Co-constructing that information from dialogue and interaction appears to help reduce anxiety and it may therefore contribute to improvements in well-being.

In consequence, this also suggests that some of the sources of stress and anxiety come from perceptions of peers which are held by individuals. This suggests that information from a facilitator may be distinct from that generated by the class. The follow-on from that is that the emotional impact is different even where the information might be the same.

Flawed beliefs about others in the peer-group may persist because it seems that there are few opportunities to explore the issues with others. Visualising them in a sufficiently representative manner seems to add belief. The consequence appears to be a change in the emotional state and the way individuals think about peers and group-relevant issues.

The issue of identity seemed to be a factor in the comment below. This student noted that they felt a greater sense of belonging as a consequence of this process. Again this is related to individual perceptions that they may be somehow different from the rest of the group.

The process appears to establish that there is much in common between the different group members.

“...it made you feel less of an outsider and it made you feel a bit better that you’re not just on your own.” [1st year student]

The product of this appears to be the articulation of the group’s identity. The above quote gives a suggestion that the student identifies with the group. She feels as though she is an ‘insider.’ The collective view appears to be more than neutral information. It appears to be active as a source of social influence (Haslam 2004).

The group-product appears to be an expression of the social-norms (the common ground) for that particular group. This is context-sensitive and particular to the group at a given moment in time.

An awareness of the collective view seems to be helpful to individuals. The comment below comes from a first year student from overseas. It also suggests that students relate their personal view to that of the group. This was a suggestion from the data in the first case study and adds to the idea that induction is as much social as it is psychological.

“I saw perhaps I was thinking a bit too much further ahead than I should be thinking and ... it kind of put me to the perspective that okay it’s not acute it’s not happening now and you’re actually quite well settled and ... it did put my concerns into the context and it showed that I don’t have to worry about what the rest of the folks haven’t even realized that they might be concerns.” [1st year student]

The comment above suggests a relational idea of development in which individual students appear to reflect on their view as a consequence of considering the view of their peer-group. If students feel a sense of belonging (identification) it suggests that they compare their view with that of the group.

This is consistent with social identity theory which says that when we are mindful of group membership we align our thoughts to those of the group (Livingstone, Haslam et al. 2011). The consequence, illustrated by the comment below, seems to be that students may experience this process as being very personal via the group identity to which they belong. This may be true where this identity, as a student arriving at the university, is made salient by the process (Steele 1997).

“...the way of making it feeling personal...making it feel all about myself but also making it feel that I interact so that’s the part that I would really highlight... you feel like you are involved at that emotional level.” [1st year student]

As in the previous case study (chapter 6), this activity appears to engage people at the emotional level. It may be personal because it is the active identity. This is the articulation of a group to which they feel a sense of belonging.

It may be ‘personal’ because it articulates the group of which individuals feel they are a member (as an ‘insider’). This group membership is part of the individual self-definition. The extent to which the group is a major or minor part of the self may be determined by the extent of the identification felt by each individual.

Social identity theory argues that this is always context-sensitive and may differ for each individual even within the same social situation. Even so, there appears to be sufficient reason to believe that the strong emotional and psychological engagement goes beyond an awareness of new information.

The data is strong enough to suggest that this process induces a sense of group-identity and there is some evidence to suggest that this social influence also causes alignment to the social and group-specific norms. Social identity theory also suggests that socialisation is a process that increases identification (Livingstone, Haslam et al. 2011) and alignment to the norms.

Greater socialisation facilitated by dialogue and interaction

The comment below suggests that for some students there was a greater sense of togetherness arising from this approach to induction. This seems to add further weight that participants identify with the group through a process of dialogue and interaction. This would seem to be a form of social integration.

“Yes it did bring everybody much closer together because everybody was feeling the same.” [1st year student]

It is interesting to note that there was a variety of issues raised by the group. Some of them may be more important to some than to others. Despite this, the student felt there was a common feeling in the group. This suggests that by articulating a representative view of the group-relevant issues, participants having a sense of their group membership, will also feel the same way about those issues.

The comment below suggests that individuals accept difference within the overall group when there is enough common ground. It also suggests that individuals may feel empathy towards other group members as part of a process of socialisation.

“It just made me understand that there are people.... that’s not just me so I feel like we are all different but at the end the main reasons are the same even if we add some extra for our own personal reasons. So I just felt that we are all different so we will have different concerns but the main ones are similar.” [2nd year student]

Review of Features of the Individual Level

Students appear to be influenced by their peers. On the one hand, that influence is based on a perception of how peers may view a particular matter. This may be regardless of any evidence and based upon belief or personal experience as representative. On the other

hand, participants appear to be influenced by the dialogue, interaction and visualisation of the collective view.

In either case the influence of peers seems to have an impact upon well-being. In situations of social isolation participants appear to be vulnerable to misperceptions about peers and their social norms. In situations where socialisation is enhanced, as in this process, participants seemed to enjoy reduced levels of anxiety.

A key part of this is the co-construction and communication of the actual norms for the given group. This process appears to articulate and share the norms thereby correcting misperceptions.

Based upon the above, this case study seems to suggest that peers may be a source of individual anxiety. As such the provision of information is important but so too is the source of that information. The suggestion here is that having the right information may not address some anxieties. The source of those anxieties may hold a key to well-being.

This case study appears to reinforce the notion that the process is one in which identity is a key feature. It appears that through this process participants develop a greater sense of belonging and feel more like ‘insiders.’ This case study also added some support to the notion that the process is one that prompts individuals to relate their thoughts and feelings to those of others.

This case study also suggests that there may be few opportunities for dialogue on group-relevant topics. This may allow the persistence of thoughts and feelings which may be detrimental to well-being and socialisation.

The group context seems to be not just important but *central* – both psychologically and pedagogically. At the same time, increasing flexibility of provision has resulted in a

corresponding fragmentation in education. These include part-time, informal, life-long and distance learners. These structural issues seem to compound the pedagogical aspects discussed here which seem to leave individuals socially isolated within the same classroom.

5.2. The Pedagogical Level

The aim of this section is to explore the idea of Shared Thinking as a form of whole-group inquiry. This should mean that participants work as a learning community (Hord 1997; Hord 2007; Hord 2008; Hord 2009) in which there is a culture of sharing ideas, feelings and practices. These goals are supported by the use of interactive classroom technology which includes voting technology and interactive whiteboards.

As mentioned above, the previous approach to induction and transition in this faculty was to provide a series of presentations from different stakeholders. It is interesting to note the way that students are encultured to expect to be passive at induction. Interviews with the participants in these sessions was quite revealing in this respect. There was a limited expectation of any dialogue with tutors. Such people are perceived as ‘authority’ figures and quite difficult to approach.

“Well I first thought....the lecturers, or whoever would be in charge, would just be talking then we would leave. Then I would expect other students to be there and they would give their opinions and then it would be questions and answers ...[I was] more relieved that it wasn’t just the standard hello goodbye and actually more welcoming and rather than just being talked to.” [1st year student]

It appears symptomatic of a culture based around individual competition as the basis for education that even the most informal event can appear threatening. This student imagined a situation that related induction to assessment.

“I thought we were going to get something like an induction target because last year was really formal in a way that it was really completely just giving

us information... I was expecting an induction pack where you took something home to read on your own or something." [2nd year male student]

This case study explores a different conception and practice for induction. Pedagogically, the aim is to investigate the adoption of a whole-group inquiry or learning community approach. Theoretically, the goal is to foster the development of group-identity as the basis for development.

Features of the Pedagogical Level

The reader should note that not all features are discussed at each level or for each case study. This is because data was not gathered for every claim in each case study.

Based on work done elsewhere, using handheld devices in mathematics, for whole-group inquiry (Stroup, Ares et al. 2004; Stroup, Ares et al. 2005; Stroup, Ares et al. 2007; Carmona and Dominguez 2008), the Shared Thinking pedagogy should include at least some of the following features:

- Participants work in a whole-group enquiry
- The start and end is unknown and determined by the interaction of those involved
- Participants are caused to talk and listen to each other
- The tutor's role is to orchestrate the interaction and manage the shift from small group to whole group and back again.
- The tutor's role is also to support the development of a shared and situated understanding of the issue
- The tutor's role is to listen as much as to talk
- Technology is used to generate and display the group-situated norms. This shared understanding needs to be valid as an authentic representation.

Participants work in a whole-group enquiry

The defining notion of whole-group enquiry must surely be that everyone is involved and engaged in the process of investigation. This is a process that leads to a shared end-product(s). It is also a process that incorporates the tutors and mentors in the shared endeavour. Following on from the introduction to this case study, above, this approach conceptualises participants as a learning community approach (Hord 1997; Hord 2007; Hord 2008; Hord 2009) to induction and transition.

Support for this re-conceptualisation should be evidenced in signs of collective activity, sharing and participants feeling involved. We would expect that the students would feel part of the group if we are to substantiate such a claim.

“That was a very hard challenge to combine all the lecturers to feel as part of the group and also all the lecturers and all the mentors are all together. So, this was a great challenge that was very well tackled.”

[1st year student A]

As in the previous two case studies, the students in this instance noted a sense of togetherness. Once again this suggests that they identified with the group and felt part of the group. As this student comments, this is an achievement in a room filled with 350 students in a single session. These students were new to each other and new to the university. This was done in half a day.

If this case study was consistent with the others and with the theoretical framework being used then we would expect that the display of aggregated votes would be representative of the group-view on the issue of arrival at university.

“Bringing up these things was something that you have to set your mind into...and done with us not for us. Not only as members or subjects of the experiment but in terms of the finding of the proper concerns and finding what we are really thinking...” [1st year student A]

Once again, we have evidence that the participants were engaged with the issues and that the concerns were authentic in terms of representing the contemporary issues for the group. There is a repeated sense of identification in this and some of this appears to be because the pedagogical structure is in synch with the theory. By this I mean that participants identify with each level in the hierarchy for that social category of a university class (from individual, to small group, to whole-group, to faculty-group and implicitly to the university).

The conventional approach to induction was to have a series of presentations from various speakers. In practical terms this configures the new arrivals as an audience. From an identity-based approach it misses out several significant groups. The students might not immediately identify with someone in a different year because they are yet to recognise their own membership of the university.

The start and end is unknown and determined by the interaction of those involved

The issues raised were quite familiar to the tutors. However, this misses the point. The aim is to help the students recognise that the issues were held in common and to do so in such a way that it was a reliable basis for individual change.

For both tutors and students the group-specific details would not be known. That is, the specific issues and the way in which they were experienced across the group would not be known.

Similarly, the issues raised were organised within an overall framework provided by the question but the options that were co-constructed were entirely open. In this respect the agenda for the session, like all the other case studies discussed to date, was determined by those involved. This gives some credence to the idea of the session being a collective inquiry.

Participants are caused to talk and listen to each other

One of the design principles of this approach to induction, in contrast with the previous approach as a series of presentations, was that the session was a process of socialization through dialogue. We would expect to see evidence that participants listened to each other and that they also had, and valued an opportunity to speak.

In the interviews, students were asked how they made their choice as to which option their group would post to the screen. The deeper purpose of the question was to gain a window on the nature and quality of the conversations.

“Well first we told each other our names and got to know what courses we were doing. Then we started discussing....to try and solve it and give our own opinions and also some of our past experiences of maybe some of the options available....and whatever the best one is.” [1st year student B]

There is some suggestion here that the participants managed to move beyond an exchange of pleasantries. The students introduced themselves to each other (not a formal part of the previous approach to induction) and then also shared their immediate concerns. The above quote suggests that participants tried to solve some of the problems in the groups and also evaluated the issues as to which was perhaps the most significant for others.

This suggests that these small-group sessions involved the identification of issues and some evidence of group-problem solving. This would imply considerable effort and depth in the discussions.

We cannot be certain that this group is representative of the set of all such groups. There was other evidence to suggest different approaches being taken by some groups.

“We were just going by rounds and everybody was talking about their main concern and once we’d done the round then anybody who had anything more to say would just say it” [1st year student C]

Despite this rather formal approach, this group allowed everyone involved a chance to speak and to feel heard by the others. Hearing the concerns of others generated new ideas and concerns.

“...but then once the main concerns were written by one person in the group then of course more ideas would come into peoples’ minds. So there were no rounds and we just shouted them out.....then we just started talking about what was written down and that’s how more ideas came up as well.”

[1st year student C]

The evidence gathered from the interviews suggested that there was a variety of different approaches taken by the groups. The quote below shows the impact of consensus in the group.

“Basically we were 3 guys together and it was the same thing for all of us. We all had the same concern. It was about money and the part-time job and how we can cope with a part time job and some study.” [1st year student D]

We do not know if this consensus led to a shallow conversation. There is a possibility that the consensus cleared the space to go deeper into a discussion of that commonly held concern. Further research is required to understand consensus and diversity in the small group context.

There was enough evidence to suggest that the students did have a useful discussion. This was certainly more than they would have had in the previous induction format. The reason why this is important was summarised by one of those interviewed.

“It’s about talking about your problems not just hearing information about them” [2nd year student]

This suggests that there is a qualitative difference in both the process and the outcomes between being a conversant and being a member of the audience.

The tutor's role is to listen as much as to talk

The adoption of a whole-group inquiry implies that the outcome is unknown and that the tutor is a co-investigator. It is the job of the tutors to listen to the issues raised by the students. The tutor would provide a framework as an initial orientation device.

“That information was what we were set to talk about...and then that was presented to the people like ‘What did you learn about it?’ and then they directly answered it.” [1st year student A]

The above quote provides some evidence to suggest that the students felt as though their concerns were central and that the students were interested in their views. This view was triangulated by the perception of one of the mentors.

“[It] felt like a mini-question time in some ways.” [mentor]

The mentor's view above provides a different perspective on the experience. Put together, these 2 views suggest that the session was perceived by everyone as a process of collective inquiry with the students setting the agenda and posing questions to those facilitating the session.

“...it was in a kind of way making us feel...that what you said was appreciated and then something was done. A step was taken a bit further than just getting the information. So this answer was prepared especially for you. So, in that sense, you are more involved in it and it's not only that you are given the answer but also get to be part of creating the answer...”
[1st year student A]

Traditional tutor-led approaches to induction mean that most of the talking is done by tutors or other presenters. This was the case in the previous approach taken to induction in the context of this case study. The effect of this change to a process of whole-group inquiry is striking for the way it made the students feel valued and involved:

The above quote highlights the value of a student-generated or co-constructed agenda as distinct from one created by the tutors. A series of presentations assumes that these are the questions students will want to have answered. The presenter then provides the information for their own questions. The students are then an audience for the presenter's internal dialogue, made public.

In a related issue, participants interviewed were asked about the possible effects of having tutors give them options already prepared. This allowed the chance to compare tutor-generated material with student-generated materials.

"...gives them worries if they've not thought about it before" [mentor]

"[I]t might even make you more worried that well my problems are not his so I might be really in trouble." [2nd year student]

This suggests that the decision to allow the participants to generate the options has pedagogical and psychological implications. It seems that tutor options may be seen as the 'official' view and one they may not understand.

One 2nd year student had already been through the original approach to 1st year induction. As such he was able to compare his transition experience using Shared Thinking with his induction experience consisting of presentations.

"...just the standard presentation and giving information is not actually tackling [our] needs." [2nd year student]

These missing needs are emotional as well as factual. It seems that participants need conversations to discuss their needs. In addition they seem to benefit from having a whole-group level perspective. This appears to relate to issues of trust in the source and the outcome as a basis for change.

"Of course you will believe [the display of student-generated issues] is real because if they just give you a piece of paper and say okay these are the

concerns that most people have it might be different from yours even if only one is different from yours then the credibility of that information is not really good for you. You think well this is for other people but I think I am different.” [2nd year student]

Students may or may not be interested in those questions created by the tutors. Either way, it seems that they need to feel the questions are grounded in their own situation. They need to feel that they are more than just an audience for others and that their thoughts and their words are heard. This gives them some sense of ownership and makes the session feel worthwhile.

By allowing the students an opportunity to have a discussion and to communicate their perspective the session then felt more like a conversation. This was a conversation firstly between the students, and secondly, between them and the tutors. As such the students are participants setting and communicating the agenda. This would appear to be more empowering from the student perspective.

“...you’ve got answers then and there and if you’ve got a major concern you would want it to get answered relatively quickly. If they were coming back later you might forget or they might forget and it might arise again and you don’t know who or where to go to. I think that’s very important that you do get it answered in the induction session and you do get it answered because the mentors and the lecturers can see what the concerns are on the board and they can answer those questions.” [1st year student C]

The above quote suggests that the conversation is useful but a response from the tutors is equally important to address the issues raised. The timing of that response appears to be also important.

“...the essential part of making it work was that the issues or the things or the answers that we gave were directly right away dealt with. If they wouldn’t have been referred to right away it would have felt more like a questionnaire.” [2nd year student]

There is a sense that without the immediacy of response from the tutor, the session risks fostering a feeling of the students being researched. This would take away the sense of an authentic inquiry. One interviewee compared a student-generated use of the technology with the more conventional use in which tutors set the questions.

“It’s like saying we’re not going to give you stuff and say ‘Do you agree with this or not?’ We’re going to let you decide what we talk about.”

[mentor]

The above quote provides some insight into the qualitative difference between authentic whole-group inquiry and a survey of the students in service of the tutor’s agenda. There is considerable evidence emerging in this case study that Shared Thinking is a ‘listening pedagogy’ (Rinaldi 2005).

Technology is used to generate and display the group-situated norms. This shared understanding needs to be valid as an authentic representation

The technology is important because it facilitates a conversation between the students and the tutors that is not otherwise be comfortable. In that sense, the technology is helping to aggregate the conversations that happen amongst the students but it also helps overcome the emotional barrier of talking to those in authority.

“I didn’t feel like I was talking to someone a lot older than me. I don’t know how to talk to them...Everything was quite informal. It was like talking to your friends. Nothing too scary.” [1st year student]

There is a sense that issues may not be discussed or addressed if students are required to articulate them to tutors. In this respect, the technology increases the interaction. This remains true beyond the 1st year of a course.

“...if I had to address my problems to one of my lecturers it would be different because it would be like formal but with my peers it was like relaxed in the room and it was like with your pals.” [2nd year student]

The ability to develop an effective enquiry depends to some extent on the willingness of participants to disclose their feelings and views. The technology allowed participants to be open without any personal sense of risk by allowing a certain amount of anonymity.

“The fact that they can sit there, give their opinion and not feel threatened as though it’s going to come back and they’re going to be asked a whole lot of questions in a large group of people.” [mentor]

“...so there was that level of anonymity so it wasn’t really that you said this...” [1st year student]

Another feature of the technology was the speed with which inputs from the groups were drawn together on the screen. This helped to hold the group and maintain a sense of togetherness.

“I was very impressed about the fact that the technology allowed us as the participants and also the organizers to work together at fast speed.” [1st year student]

This cohesion was also able to be maintained by the efficiency of the process but also the relative simplicity of the interaction. This helped to sustain the focus and maintain the interaction.

“I think it was quite efficient really and it was quite simple to use. You just pressed a couple of buttons and it came up and it was quite advanced technology.” [1st year student]

The technology also meant that participants felt engaged and involved in a highly structured process of interaction. It was also something that added to the enjoyment of the session. This is quite a strong contrast from students as an audience for different presentations. These were all factors appreciated by the students. This also enhanced their view of the providers.

“...technology made it more fun because it was forcing you to participate and pay attention to what is said. You couldn’t just wonder around or talk

to the guy next to you. So it was both fun and...it showed that people had put a lot of time and effort into organizing this.” [1st year student]

The technology helped participants give a communicable form to their collective thought (Papert, 1980; Papert & Harel, 1991) and to make it visible. In this way, learners were able to see what they have built together (Pea, 1989) to support dialogue and sense-making. Others have described this collective view of current thinking as ‘socially authentic’ (Hegedus & Kaput, 2003; Hegedus et al., 2007).

“It was quite good to feel everyone interacting. It was interacting with the little handsets as well as well as hearing how other students had struggled and their tips and that just to try and get the whole going from school to university more simpler.” [1st year student]

From the above quote, and others here, it is clear that the technology combined with other factors to generate a more comfortable and useful experience of induction.

Review of Features at the Pedagogical Level

The collective nature of this approach suggests that participants are working as a ‘learning community.’ There is little doubt that this change from tutor-led models of induction, to one based around a student-generated learning agenda, configured the group in a distinct and different way. The sense of togetherness suggested a collective inquiry into issues to do with arriving at university.

There was clear evidence to show that the session was organised to allow the students to talk and listen to each other. They were able to listen through the exchange of views in small groups. They were also able to listen to each other through the issues and votes submitted to the screen.

The tutor was certainly in a radically different role to one based on presentations. Here the tutor was involved in orchestrating the move from individual to small group interaction and up to the whole-group level. The tutor managed the input of around 300 views in real-time and sorted them into categories to make them coherent for voting. This in turn provided a shape for the response of tutors and mentors.

The tutor was also a listener in this session. The students posted their views to the screen and provided a shape and an invitation to respond to the issues. Similarly, this provided a shape for the response of others such as mentors from other year-groups.

This case study used different structures and, as part of the management of the session, the tutor ran 2 sessions – one in the morning and another in the afternoon. The morning session involved dividing the students into break-out rooms to meet with the mentors. The afternoon session held everyone in the same room and introduced the mentoring input as a follow-on activity in the lecture theatre.

The technology was slightly different this time. It included texting to the screen from handsets. It also included the use of Likert-Style scales for each option. Equally, interesting was the way that the technology covered the practical aspects of scale but also addressed the emotional issues of interaction between students and tutors.

In the previous case study we were alerted to the management of disposition and here the technology can be seen to overcome affective barriers. These are important and linked to the ability to engage in cognitive aspects of the activity.

Similarly the technology clearly helped to support the co-construction of the shared and situated understanding on the screen. It did this quickly and efficiently in such a way as to help maintain the overall feeling of the session as a conversation.

5.3 The Research Level

The Shared Thinking approach organises participants to reflect and learn together. The design configures participants in a social investigation of the situated conceptual view. The result of the interaction is the joint production of a visible view of the issues each set one in relation to the other. The display shows both quantitative and qualitative data on the screen. The product represents a shared understanding of the issue in its social context. As such everyone is a researcher.

Features of the Research Level

The reader should note that not all features are discussed at each level or for each case study. By organising the interaction using the Shared Thinking approach, the key features relating to the research level include:

- A way of investigating the student experience at the collective level
- A way of exploring a comparative view of collective level data
- A way of involving participants as Action Learners

A way of investigating the student experience at the collective level

The first case study showed the ability to investigate the collective experience of students in different years. The second case study showed the ability to investigate and aggregate the distributed experience of tutors working in different universities on a national initiative. We also saw how we could evaluate the shared thinking approach using conventional uses of voting technology. That was a collective approach to evaluation.

This third case study used a different data display-format and a slightly different approach to the voting. Participants were asked to vote on each option instead of voting for the option the perceived to be most important.

This case study saw the use of an electronic Likert scale for each option. Participants voted 1-5 for each option. The aggregated inputs resulted in an averaged point on the Likert scale for each option.

The benefit of this was the ability to investigate each option in depth. This does require more voting but in a large group it felt as though participants were busier. In a small group it may be distracting or even tiresome. More research is required to investigate the relationship between group-size and frequency of interaction via the technology.

A way of exploring a comparative view of collective level data

Setting aside the discussion of formats and activity structures, we have a view of the collective experience of first year and second year students. This is at faculty rather than course level. This offers the possibility of comparative views of collective data in a manner similar to that in the first workshop of the first case study.

In the previous case studies, we were able to compare representations of collective experience before and after interaction with mentors in the first case study. We were also able to compare the journey of one cohort at the start of 2 different years on their course.

In this case study, we were also able to compare the collective view of 2 different sub-groups from the faculty. We divided up the students into a morning and an afternoon session. This was done in order to cope with the numbers. It also offered the opportunity to explore different structures. Figure 8 below shows the output of the morning session.

Figure 8: Concerns held on arrival at university in Morning Session

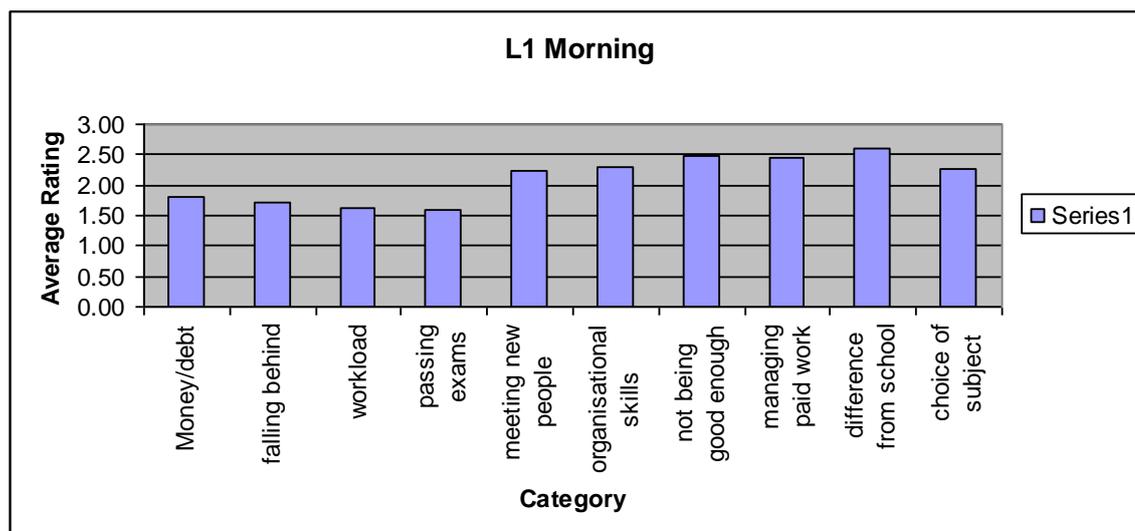
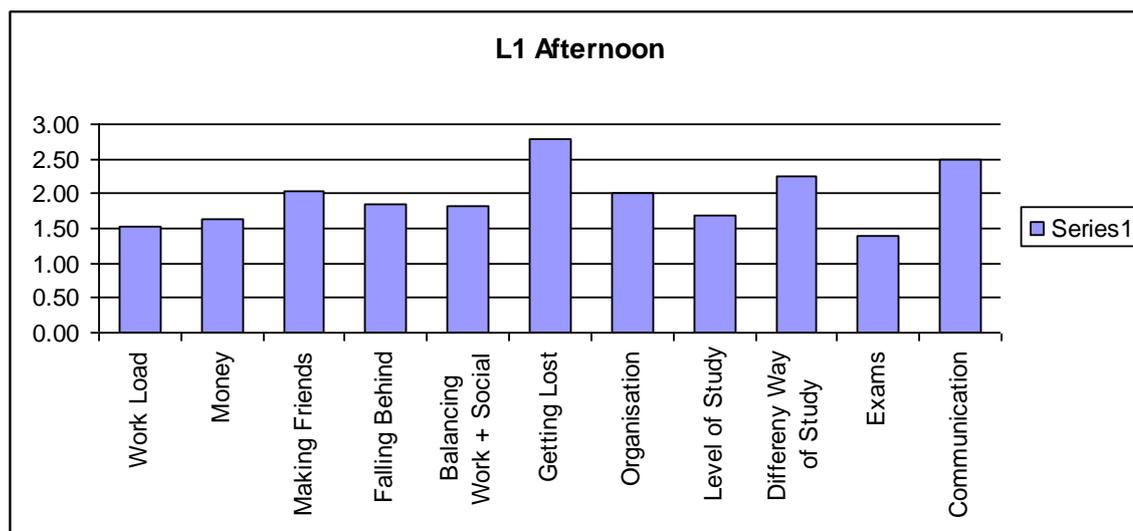


Figure 9 below shows the output from the afternoon session. A brief view of the two group-products shows a broad similarity in the concerns to do with money and workload for example. We can also see different ways of phrasing similar issues such as ‘making friends’ and ‘meeting new people.’ There are also some issues that were unique to a given session.

The approach used in this case study appears to offer greater detail than the outputs from the other case studies. This offers new ways of exploring and comparing collective experience. More research is required to evaluate the point at which the display may become too rich to be easily interpreted by participants during a session.

We should also remember that the data generated is as much for the benefit of participants as for tutors and researchers. There may be other issues and opportunities to use different formats. This is a pedagogical issue and a research issue.

Figure 9: Concerns held on arrival at university in Afternoon Session



In this case study, we were also able to compare and contrast the collective-view of one set of first year students with another for a set of second year students. These products were both generated at the start of the appropriate academic year.

Review of Features for Research Level

The Shared Thinking approach offers the opportunity to understand change, both in qualitative and quantitative terms, from one year to the next. We can use this to understand the changes in the nature of the concerns as the course unfolds. We can do this for each year group on a course each in their first week. We could also do it for the same cohort as they begin each year of their course to understand the collective experience of one group over time.

In addition, it seems that benefits may accrue to the participants as well as to the researchers when both are able to see the common ground. Further research is needed to investigate the potential of this approach for all those interested or involved.

This case study shows how we can investigate collective experience in different ways to those in previous case studies. It also shows how we can add greater depth in the coverage of each issue generated by the participants.

6. Discussion

This case study appears to add to the earlier case studies in several ways. It provided some insights into the experience of this approach from a first year perspective. This was missing from the earlier cases.

In addition, it added to the emerging belief that this approach seems to be about the development of a shared sense of identity. This process appears to develop a sense of belonging and to change people's view of themselves to one of being 'insiders.'

We saw further support for the idea that this process prompts individuals to relate their thinking to that of the rest of the group. This relational form of thinking appears to induce an emotional response and there was some evidence for this feeling 'personalised.'

It was also interesting to see this case study contributing further to a developing understanding of social influence. We saw how students may carry a view of their peers on different matters. We saw how such perceptions may be wrong. We also saw how the co-construction of that social-reality could contribute towards greater well-being. It seems that the source of information may be as important as the information itself.

Pedagogically, this case study added to the emerging set of techniques and variables that might be deployed. We saw how the core Shared Thinking design from the first session in the first case study could be developed in new ways.

The most obvious of these was the ability to scale up the numbers of participants. This case study included several hundred participants in a single session. Previously the group sizes were typically between 12 and 30 participants.

We also explored different structures. For instance, in this case study we divided the whole group into different sub-groups. Each sub-group went to a room of its own to interact with mentors. This happened after a whole-group session.

In addition, this case study involved the use of different technologies. In this case, students used handsets that allowed them to text information directly to the screen. Interactive whiteboards were used to enable the tutor to sort the incoming information into a list of options. This allowed the students to vote.

The voting was also different in this case study. Students voted for each option rather than for a single preferred choice. This increased the interaction conducted through the technology. It also generated a more detailed view of the issues relative to each other.

This case study provided interview data that was missing from the initial case study which also covered induction and transition. We are still not much wiser about the nature of the small-group discussions. We have some self-reports on the nature of the discussions but these are summaries in response to a question. These are reports after the event.

It will be useful, if not essential, to understand the nature of the dialogue as it unfolds in the small-groups. This will help to triangulate some of the data from interviews in this and future case studies. It may also contribute towards a better understanding of the pedagogy and the extent to which social identity theory seems appropriate as a distinct way of thinking about group-learning. In the next case study, we will look at the use of the Shared Thinking technique to aggregate student placement experiences, in a teacher training context.

Chapter 8: Case Study 4 – Reflection on Student Teaching Placements

1. Introduction

This fourth case study is about the idea of student teachers, drawing upon different teaching placement experiences, reflecting on their practice together. Traditionally placements have been understood as quite individual experiences. As mentioned in the second case study, there has also been some difficulty in the literature regarding the identification of a role for the university in the relationship between an employer and a learner (Ryan, Toohey et al. 1996; Krechevsky, Rivard et al. 2010).

There is also a discussion in the literature about the importance and the tensions that may arise when feedback comes from different sources (Hattie and Timperley 2007). The role and value of feedback from different sources is an issue for the development of the student. This case study will hopefully throw some light on the psychological saliency of some sources above others.

Osguthorpe defines collaborative reflection as “prolonged joint work on the continual process of improving one’s practice and the commitment to help others improve theirs” (Osguthorpe 1999). The purpose of collaborative reflection is to do with supporting personal and professional growth in unique and complex pedagogical settings. David Boud has highlighted the need for tutors to reflect on their practice in teams. In the past, teachers typically worked alone (Boud, Cressey et al. 2006).

“As we move beyond the individual towards the social context then..... [w]e need to find ways of rehabilitating some key aspects of reflection that have been eroded through unthinking use while moving further to deal with these new issues. This is the challenge from professional practice that confronts us” (Boud, Cressey et al. 2006).

Today there is a greater emphasis on team teaching and working within team structures. Others believe that reflection involves a change in the whole person (Castle and et al. 1995). They suggest that it is “complex and demanding”, and that “it is not likely to occur in any depth unless those involved are willing to reflect on themselves and their practice and to set this reflection in a collaborative context.”

For reflection to be useful in a professional development context such as teaching, it has to be carried out in a critical way. Reflection without critique can be an ego enhancing activity. Critical reflection carried out in the company of others has powerful positive democratic consequences (Young 1992).

Collaborative reflection offers different perspectives from within the group and this also provides checks and balances on private views. Independent reflection, usually through reflective writing, may address only the early stages of Kolb’s learning cycle (Kolb 1984; Platzer, Blake et al. 2000). Collaborative reflection may deepen that process and help develop broader thinking to support learning (Viilo, Seitamaa-Hakkarainen et al. 2011).

Enablers of collaborative reflection include attitudinal characteristics such as being open towards sharing and having an intention to learn together (Platzer, Blake et al. 2000). A clear structure is also required to support reflection in groups (Platzer, Snelling et al. 1997)

Conversely, barriers to collaborative sharing include personal issues, actions of other people involved and actions of tutors/facilitators (Johns 1995; Platzer, Snelling et al. 1997). These personal issues include a lack of belief in the value of your own views and a lack of ability to articulate experience. It also includes a lack of confidence and a possible inability to identify relevant experience. The actions of others include situations where others might dominate discussions or disrupt the reflective process. It also includes a possible unwillingness to participate in a collaborative process. The actions of facilitators relates to their possible inability to facilitate the process. It also includes their perceptions regarding their role in the process.

Having a process for reflecting together can help avoid drawn out, casual or unfocused conversations (Castle and et al. 1995). Processes for collaborative reflection typically include the use of written records (diaries, journals etc.). These may be sampled and shared with others involved in the event which is being reviewed.

The thoughts and feelings of the group are recorded in the pie charts generated by the Shared Thinking process. These group documents may function in the same way as the learning journal does for individual thought. They may create a space for both individual and social reflection and helping to rehabilitate the individual view back into the social context (Boud, Cressey et al. 2006).

2. The Case Study Context

This case study was located in an Education Department at a new university. Tutors there expressed an interest in participating in the Shared Thinking project as a way of helping students to reflect together on their teaching placements.

Two tutors were interviewed. One of them was interviewed before and the other after the sessions had taken place. It emerged that students had a variety of different ways to reflect upon their placements but the department had no technique for supporting a whole class to reflect together. As a consequence, there was less opportunity for the students to discuss their placements with their peers as a formal part of the course.

Another reason why there was no formal opportunity to reflect together was that placement experiences were thought to be so diverse and personal that it would be difficult to create a dialogue that would be meaningful to a whole-group.

The tutor felt it was difficult to deal with the diversity and the students reflected in writing or with staff. It is therefore interesting to see the response to this experience from the interviewees.

“.... the only time you have to evaluate back in university is the module evaluation forms that you just fill in and you just tick a few boxes and occasionally the odd tutor might... you know the sort of thing... There’s not a formal process for going through a group session or anything like that that makes you talk more about it. I think it’s more word of mouth you know you talk to friends about what experiences they had in that sort of social context.” [Student S]

There is a real need for the students to be able to discuss their experiences and to reflect together on their teaching placements. This needs to be done in a way that is for them rather than for administration and assessment. This has far more value socially, emotionally and professionally.

“We’ve never actually had the opportunity to like sit and say ‘Well that worked for me’ and ‘That didn’t work in this school’ or ‘It worked before and it hasn’t worked this time’ or ‘I feel I’ve achieved this.’ We’ve never had the chance to actually do that as a group before.” [Student A]

The consequences of missing out on the opportunity to reflect together, on their own terms, are that students can become frustrated. Students can feel that the university is not interested and they can harbour resentment about not being able to discuss their experiences.

“We didn’t really. Last year we didn’t and my friend in our group was very annoyed because she had a bit of a rough placement and we didn’t have a chance to voice our opinions.... Sometimes you had a little discussion with your academic tutor but not very much...” [Student E]

It also seems that there may be an underlying view shared amongst staff and students that individual teaching placements are so diverse that it would be unmanageable to orchestrate a collective approach to reflective practice regardless of any benefits.

The group chosen, by the tutor, to participate were final year students. They were on the same course but with different specialisms. We ran 2 sessions and this meant one for the Early Years Primary specialism and one for those taking a Later Years option.

This final year cohort was also chosen because they had just completed their placements so it was timely. The tutors also felt that it might be more difficult for those at the start of the course to engage. This was because the first years might have a limited vocabulary to be able to discuss their experience and reflect together productively.

Reflection on placements, in this case study, was largely done as a requirement for assessment or administration.

“There’s a sense in which we don’t. I mean the module evaluation would reflect on it but...I think that [session] was quite a distinct thing and a bit different.” [Tutor]

Students did get feedback from completing questionnaires etc. but it was slow and participants saw it as a chore rather than something that would inform their development in a meaningful way.

“I thought it was a nice way of doing it because quite often we get the same old uni questionnaires to fill in and you know it can get a bit dull just ticking a box all the time so it was quite nice because ... you got feedback straight away. If you tick a box you don’t know what half the room have ticked. You see the feedback straight away.” [Student E]

Despite there being different people to whom these students reported there is a sense that reflection is considered within a strengths and weaknesses framework. Even then it is not something done often and it misses out on any exploratory dialogue or wider perspective. Reflection on practice was done in the schools with teachers, supervisors and mentors.

“Well we do like summative reflection with your mentor which is in school and our class teacher just writes a report on how things have worked well

for you, what you enjoyed and what's your strengths and weaknesses. We do that at the end of year 4." [Student R]

Students did sometimes find writing useful as a means of self-evaluation. However, it is also noticeable that none of the students saw much value in the learning journals. This last point was based on the votes reported in the above section on research.

"A lot of writing but it does help you because I keep writing throughout but not on the actual sheet that you're meant to hand in. I would just write throughout and then say what I think are my strengths or what I found in my placement or what think I can really excel at or what I particularly like to teach and this that and the other." [Student R]

There is a strong sense of writing as a performance rather than for developing professional knowledge. This student is storing notes to write a report. The report is clearly not seen as useful in any way other than for assessment.

"So that develops into a big long list so then I have the help for like doing this summative report at the end because it is quite long-winded. You can't even remember it at the end you're just glad you finished. You just need it to help you write it." [Student R]

This makes the case for a different approach. Reflecting on your own can be useful but it needs to feel like it can be beneficial in an authentic way. I argue in this study that students may benefit from a reflective discussion to make sense of their experiences. This broadens their view by having a wider perspective on their personal experience.

3. Case Study Participants

These were final year students on a teacher training degree. They came together just after having completed their final school placement. This was the first occasion that the students had reviewed their placement experiences together in a whole-group discussion format.

There were approximately 24 Early Years students in the first session. There were approximately 43 Later Years students in the second session. Three early years students were interviewed. One Later Years student was interviewed.

4. Research Methods

Ethics approval was requested and gained for the research activity. For this case study, a questionnaire was used to facilitate individual students to record their concerns. These questionnaires contained a single question asking about their main concern on arriving at university. It also invited them to indicate whether or not they would be willing to participate in an interview with the researcher. These questionnaires were collected in at the end of the three main sessions (Year 2 students plus two sessions for Year 1).

Those that had indicated a willingness to participate in a telephone interview were contacted by email to arrange a time and to provide contact details. From those indicating a willingness to participate in the research, six interviews were arranged.

Telephone interviews were conducted over Skype. Each participant was briefed on the ethics of the interview, that it was being recorded and that all data would remain anonymous. Each participant was given contact details for the research supervisor should they have concerns on any matter arising or connected with the research.

The interviews were recorded using a microphone held near the computer speakers. This allowed both sides of the conversation to be captured. The recording was then transcribed. The interviews were semi-structured. The different stages of the Shared Thinking session structure was used as an organising framework for the interviews. When issues of interest to either the researcher or the participant arose, space and time was given to exploring that issue in more detail.

Data captured through the technology was also analysed. All the data was set within the structure of the session. Later the data was re-organised into the 3 main themes of individual, collective/pedagogical and research.

4.1 The Case Study Procedure

We delivered two sessions for this case study. One was for Early Years Primary school trainees. The other was for Later Years primary school trainees. Each of these sessions lasted for two hours. Each consisted of three phases (rounds) of Shared Thinking.

Activity Structure for Phase 1

- Introduction to session & plan
- Distribute & complete questionnaire
- Small group discussion on which aspects of their placement would most improve their practice
- Create a set of questions from the discussion
- Vote on main concern
- Plenary discussion on issues arising

Activity Structure for Phase 2

- Introduction to session & plan
- Distribute & complete questionnaire
- Small group discussion on which aspects of their placement would most improve their teaching
- Create a set of questions from the discussion
- Vote on main concern
- Plenary discussion on issues arising

Activity Structure for Phase 3

- Introduction to session & plan
- Distribute & complete questionnaire
- Small group discussion on which aspects of their placement would most improve their evaluation
- Create a set of questions from the discussion
- Vote on main concern
- Plenary discussion on issues arising

Closing Structure

- Review whole session
- Tutor comment
- Thanks & close

5. Data Analysis

The approach used to analyse the data is described in detail in chapter four. Three levels of impact were used to structure the analysis. They are:

- The Individual Level
- The Pedagogical Level
- The Research Level

5.1 The Individual Level

The reader should note that not all features are discussed at each level or for each case study. By organising the interaction using the Shared Thinking approach, the individual level features are that this will support:

- The possibility of cognitive change through perspective-taking
- Emotional benefits from sharing and dialogue with others
- Greater socialisation facilitated by dialogue and interaction.

The possibility of cognitive change through perspective-taking

The comment below suggests a particular orientation towards the views generated on the screen. This person seems to be relating each option created by the class to their own view. It suggests that some participants may scrutinize the options in search of one that accords with their own view. It also appears that this person re-visited the question again before deciding on which one for which they would vote.

“[W]hen they were up on the board I was thinking ‘yes that one fits and that one’s not me. Yes I’d say that.’ And I went through them as people were saying them and then chose which one and then I read the caption...the question again at the top and then thought that one fits the best for me. [Student A]

A different student provided a hint of the relationship between the conversation and the decision to vote. It appears that the anonymity of the voting process allowed people to reach their own decision. The participant below seems to feel a sense of personal freedom and this response suggests that they may have changed their mind as the process developed.

“I think the real difference that made was the fact that yes you can discuss it but if you’ve completely changed your mind, you were able to get your point across and change your mind without saying you have. You voted but

you didn't have to turn round and say I've completely changed my mind."

[Student S]

It seems that individuals are able to use the group as a resource for thinking. As in the earlier case studies it seems that the process prompts participants to reflect on their own view. The comment below suggests that students were prompted to listen to the views of others as the process expanded. The conversations also appear to have furnished this participant with new ideas.

"...obviously as a whole group you're going to highlight things you hadn't thought about yet and when that happened I thought 'Oh let's listen to this because I haven't thought about that' and listening highlighted things I'd never thought about and talking together that was good. That was really beneficial..." [Student R]

The above comment suggests that conversations were useful in this process. The comment below seems to suggest that through comparing experiences, and hearing the way others used certain terms, participants may be supported in developing a deeper understanding of professional terminology.

"We were saying like things...like evaluating..... I mean.....what some people call evaluating and other people didn't and I thought well actually thinking about it, yes that was evaluating it but I didn't think about it at that time. [Student A]

The above quote suggests that students may have different conceptions of professional terms and how they relate to their practice. It also seems to add weight to the idea of relational development as a possible feature of this process. They appear to under-value their efforts when relating to perceived norms. The above suggests that meanings may need to be negotiated and not simply grafted onto a group (Duschl, 2008). The quote below suggests that a lack of contextual awareness seems to make it more difficult to appreciate personal achievements.

“And you realized that you’d done things that other people have picked up on and you haven’t and they’ve actually been constructive things but you’ve just done them in the general run of placements.” [Student A]

The comment below suggests that the way students thought about the issues they generated was different from the way they might think about issues presented by a tutor. This seems to suggest that the issues come out of the discussion when the students create them. When the tutors present them they may lack context or meaning.

“..[tutors] might not necessarily have come up with all the ideas we did but you’d kind of limit yourself because then you’d go through each one in turn and go ‘well what do I think about that?’ or ‘what do I think about that? It wouldn’t be discussing it and ‘what do you feel strongly about?’ It’s just ‘was that quite important?’ or ‘do I just think that?’ you know. It like forces you to think in a certain way I suppose.” [Student E]

Emotional benefits from sharing and dialogue with others

Students on work-placements can often feel isolated. They are away from the support of the institutional environment for an extensive period of time. Even with email contact, it is often difficult to understand individual experience in a wider context – either of the course or the profession.

The comment below suggests that students may find it difficult to place their progress in context. It seems that the peer-group context may be used as a gauge for individual development. This may be more so when a view of that context is available for comparison.

“That helped me because I thought that sometimes when you’re in school you think well ‘Am I pushing it a bit too far? Am I acting like a teacher when I’m not quite yet?’ And then in that session when we heard like other people who’d done the same thing. I thought well ‘Ah, I’m where I am and where I should be. I’m not too far and being too pushy and I’m not being

too quiet. I'm doing what I should be doing.' I found that helpful."

[Student A]

The above quote suggests a relational idea of development. This fits with data from earlier case studies showing how some people were prompted to be reflective when they saw or heard the thoughts of others.

In case study three, a second year student, talked about seeing with her own eyes. That suggested a sense of belief or affirmation of one's personal view from seeing the collective view. The quote below suggests that the process and the view of the group's opinions confirmed a sense of shared achievement. There was a suggestion that the process seemed to assert a level of independence from the institution.

"Yes you could physically and visibly see how you've all changed. How you've gone from relying on university for everything you do. Actually it's not university you rely on when you're in school it's the school itself. They do it. They don't." [Student A]

Greater socialisation facilitated by dialogue and interaction

There seemed to be a lack of opportunity for peers to discuss their concerns, interests and issues together as a whole group. The comment below also suggests that the views of some peers were rarely heard and that it was good to hear their voices.

"There was a few people in our group that you may not always talk to it's nice to get there point of view as well about how they found it." [Student E]

Review of Features at the Individual Level

Once again, this case study raised the issue of relational thought and development. In parallel to this was the issue of social isolation. It seems from the comments above, that on

the one hand, participants developed perceptions of their own development that may be inaccurate. It also seems, on the other hand, that when individuals are able to locate their thinking within the context of their peer-group it can be emotionally helpful and be a source of new ideas.

It seemed that when participants were able to access a conversation and a summary of the whole-group perspective they were prompted to relate their personal thoughts to those on the screen. This seemed to be a different way of thinking to one considering issues presented by a tutor. We might assume this is because the issues raised are the products of the reflective dialogue amongst those present whereas the tutor's comments may appear de-contextualised to the group.

Taken together, the comments above suggest that the peer-group is important as a sense-making environment. That group appears to help in the way Bruffee talks about transitional communities supporting language acquisition (Roen 1990; Bruffee 1993). According to those authors, participants are said to translate the professional language into their own words and take ownership of the discourse.

Bruffee sees education as providing stages for discourse development (Bruffee 1993). He sees collaborative learning as being about the development of professional discourse in classroom communities using collaborative learning. The comments above suggest that this may not be naturally occurring or, put another way, it seems possible that the process can be facilitated by the introduction of discussions based around the thoughts and experiences of the participants. This is equally an indictment of social isolation in education for the way such approaches may impair development and raise anxiety. More work is needed to substantiate these claims more fully.

5.2 The Pedagogical Level

The aim of this section is to explore the idea of Shared Thinking as a form of whole-group inquiry. This should mean that participants work as a learning community (Hord 1997; Hord 2007; Hord 2008; Hord 2009) in which there is a culture of sharing ideas, feelings and practices. These goals are supported by the use of interactive classroom technology which includes voting technology and interactive whiteboards.

Features of the Pedagogical Level

The reader should note that not all features are discussed at each level or for each case study. By organizing the interaction using the Shared Thinking approach, the key features include:

- Participants work in a whole-group enquiry
- The start and end is unknown and determined by the interaction of those involved
- Participants are caused to talk and listen to each other
- The tutor's role is to orchestrate the interaction and manage the shift from small group to whole group and back again.
- The tutor's role is also to support the development of a shared and situated understanding of the issue
- The tutor's role is to listen as much as to talk
- Technology is used to generate and display a shared situated understanding. This shared understanding needs to be valid as representative in terms of detail, issues and participation. It has to be plausible.

Participants work in a whole-group enquiry

Interviewees were asked to compare the way they thought about the co-constructed options and how it differed from the more usual approach to using voting technology in which the tutor presents readymade questions.

There was some evidence that students felt it required more mental effort when they had to construct the questions. It was a process that required them to reflect quite deeply on their practice in order to create the options.

“I’d say because we had to come up with the questions, yes it was more of a challenge for us and more of a challenge to get them on the board and things but it made us actually have to think about that element of our practice.” [Student A]

Similar views were expressed in the second and third case studies where interviewees described the process as engaging. From a social identity perspective, engagement appears to be synonymous with identification with the issues as group-norms.

To obtain a clear picture of this issue, interviewees were asked to compare co-construction of options with having question-options already made by the tutor.

“If you have a ready-made question I suppose you don’t agree with quite a lot of it. I’m not saying that I agree with everything that the students said but there were parts of it that I thought “yes, yes, I agree” but definitely we were involved with the answers to the questions. I think it was a real interpretation of our answers.” [Student E]

The amount of attention given to the options appeared to be in sharp contrast with the level of engagement that students felt when they co-constructed the issues for themselves.

“....Oh I probably shouldn’t say this but...I’d just look for mine and what would work for me...then I wouldn’t give a second thought to the other questions at all, to be honest. I know that sounds really bad but it’s the truth.” [Student R]

It appears that questions from outside the group may generate a different attitude or disposition. There appears to be less mental and emotional investment on the part of some students when the questions are already formed. The perception of the tutor’s questions may be that they are a check to see if an individual has the correct answer.

There also appeared to be a sense of the answer being already known by the tutor when readymade questions were used. By building the session around the views of the students it clearly felt more like an open-ended enquiry.

“If you’d given us the answers it would have been like you’re leading us to a certain answer because if you’ve got the answers there you can’t help but lead a group of people to a certain answer... You feel like you’re led somewhere. Where with us coming up with them there was no leading. It was like here’s your discussion point. Off you go!” [Student A]

When the students have created the question-options they appear to be representative of their dialogue and that would suggest a greater sense of identification with the consequent increase in the level of engagement.

There was some evidence to suggest that there was a greater sense of ownership of the session because the students were given permission and a structure to explore their experiences.

“It did feel like it was ours. It’s like someone’s come along with some questions and they don’t know the answers and that’s what they’re here to find out. ... It made it ours. It wasn’t your session, so to speak, it was ours. We did it. You had the [framework] ready but we came up with the answers. We had the discussions. It was like being in groups that kind of thing. It was good.” [Student A]

In the third case study, we also saw similar reactions and a corresponding view that the session was hosted by tutors but owned and about the participants. This would account for why the participants appear to identify with the issues and with each other. There is a sense, in the above quote, that this was a qualitatively different experience of group learning and that it generated an emotional response.

In the context of reviewing work-placements together, this approach appears to overcome the issue of different placements. The diversity of experiences appears to add to the

richness of the inquiry. Equally, it also appears to help overcome any tendency to focus on a particularly good or bad individual placement. The conversation seems to be at a group or meta-level and thereby connect more closely to the profession at large.

The start and end is unknown and determined by the interaction of those involved

Reviewing this case study with those before, it seems that there is quite substantial evidence that this feature seems true. The quote above, in the earlier section, shows the open-endedness of the session and we have been able to compare this with having the tutor bring in questions that were prepared in advance.

The tutor's questions appear to be experienced as closed in terms of the boundaries of the discussion. They also appear to implicitly suggest that there is a 'right' answer. This tends to generate a different learning disposition (Carr and Claxton 2002) and a qualitatively different experience.

Participants are caused to talk and listen to each other

Central to the idea of a way of learning based upon enquiry is the notion that much of the talk happens within the group. This is central to the process of investigation.

This is also distinct from a 'traditional' alternative in which the tutor does most of the talking. The quotes in earlier sections have already displayed some evidence to suggest support for this view. To this I add one more to reinforce the point about a qualitative difference in thought and conversation when tutors use readymade options.

"I think your discussion would be 'Yes or No?' Say if it was like evaluating your placement and you had like 'Reflective journals' people would go 'No.' 'Discussion with teachers, 'Yes.' You wouldn't get the conversation. You'd get yes or no answers. [Student A]

We know from the literature on voting technologies that the design of questions is highlighted as a key issue that determines the ‘success’ of the session and that also demands considerable mental effort on the part of the tutor (Sharp and Sutherland 2007). The original proposal for this thesis picked up this point as the justification for students preparing questions together.

Pedagogically, most of our conceptions of teaching and learning are quite likely related to an image of answering someone else's questions - probably those of a teacher. In schools, teachers ask most questions. Only a few of those questions invite deeper level thinking (Gall 1984).

Opportunities may be rare for learners to raise questions with the teacher and as a consequence, they rarely ask many questions (Gall 1984). In some respects higher education may be similar. This suggests that there is a corresponding lack of opportunity for discussions that might lead to the generation of questions by students.

Watts and de Jesus (2005) suggest that the activity of generating questions involves "*the structuring of learning through the clarification of intent, fact finding, improving the grasp of principles, and clarifying the explicit and tacit learning to be done* (Pedrosa de Jesus, Teixeira-Dias et al. 2003)." Questioning is a central part of development because of the way it organizes the mind and the investigative process (Rosenshine, Meister et al. 1996; Ciardiello 1998). Questions come from a dialogue – internal and external such that without reflective conversations they may be more difficult to develop. We can see from the quotes above that this requires tutors to foster a different learning disposition that comes from dialogue and leads to the creation of questioning.

Questioning is "*a cognitive strategy that fosters reading comprehension, because it guides the reader to search the text, combine information, and note relationships between different ideas*" (Ciardiello 1998). Regardless of the media, questioning is regarded as both a cognitive and a metacognitive activity (Ciardiello 1998). This view was reflected in the responses from the interviewees in this case study.

“...it would just be a pile of questions that we were answering where we probably...wouldn't have given it as much thought as we had when we generated in front of us.” [Student R]

There was some suggestion that discussion was a form of apprenticeship in becoming versed in the vocabulary and, more importantly, the meaning of professional terms. One interviewee reflected on the experience of discussing their placement with others.

“I think it would help [first years] because I mean you don't know how to evaluate something. You've never had to do it before until you come to university. Not really and I think it would be good for them especially just after their placement so they can learn how to talk about it.” [Student A]

It is interesting that one of the reasons the tutor selected the final year students to participate in this session was the belief that they would be more eloquent about their experience and therefore able to discuss it in a more professional manner. The above quote tends to favour Bruffee's view that each class might be understood as a 'transitional community' and a means for understanding professional language through dialogue with peers and as a link to the wider discourse (Roen 1990; Bruffee 1993). In brief, students appear to develop an understanding through dialogue around known referents.

The following quote is interesting from the perspective of discussion and listening. This interviewee talks about the session being based around the exchange of stories. It was interesting to see how storying experience may be connected to formal or professional issues. It is not a trivial activity.

“Yes. Yes you're sharing stories and experiences and so something where you had to talk to each other more - about the formal stuff and the standard practice things. I think you gave us the stimulus to talk about those things and that was very different to a conversation about the rest of it.” [Student S]

It follows, that if the session involves the exchange of stories, and the pie-chart built by the discussion and interaction of participants is representative, then that pie-chart can reasonably be regarded as a meta-story or a collective biography. The discussion of individual stories raised questions and that emerging set of issues and the student reaction to them generated a larger group-specific and professional-level story. This was repeatedly stated by the participants, in this and other case studies, to be different to a consideration of tutor-authored questions.

The following quote suggests that students are developing a group-level discourse. One consequence of this is that they appear to have gained more confidence.

“..... if you're talking with people who have been in the situation at the time who've been there doing the same things that you've been doing and then hear that they've done the same things and they've gone down the same route, it gives you a bit more confidence. I think if a lecturer was standing at the front saying 'Well you should have done this and you should have done that' because if you haven't done it you then sit and panic.” [Student A]

As already mentioned, the space to discuss and share experiences in a whole-group inquiry fosters a different learning disposition. Equally, it seems that the alternative is to exert power from above which appears to engender anxiety.

Listening to Other Groups

In the 2nd case study, in chapter 6, some data was presented showing the reaction of participants to the whole-group view. That was a reaction in the plenary session that followed the display of voting results.

In this case study, we are able to see the reaction to hearing the choices of other groups. The students are not merely waiting to vote. They are also processing the group decisions and relating to them.

There was some evidence to suggest that students were receptive to different perspectives when they came from their peers. The interviewee below appreciated the response from others and it appears to have influenced their willingness to consider alternative views.

“Yes it was quite nice because when we fed back you got to hear from other groups and you thought ‘oh that’s nice I hadn’t thought of that.’ It was different ways of answering the question sort of thing.” [Student E]

The above quote suggests that participants were open to the responses of others and this fits with the open-ended nature of the inquiry. We have a sense of acceptance of the views of others, as perspectives that are valid for some people or some contexts, and that are heard by the group. This is in contrast to a perception of some answers being more absolute.

When the initial small-group discussions were concluded there was an opportunity to hear the decisions of each group. It was clear that individuals were evaluating these views and relating them to their own conversations.

“We went first and said ours. Then everybody else went and said there’s and as other people were suggesting we had said to each other as a group ‘oh we’ve obviously got that a bit wrong...and we’d all gone ‘actually other people have suggested other things that we actually agreed with more.”
[Student S]

Hearing the views of other groups also appears to have prompted a brief review of their choice in some groups. There was some evidence to suggest that this might prompt some to change their views.

“...the question where nobody voted for our answer we did have a sort of a talk about it in the transition to the next question...sort of quick comments

rather than a full on discussion but if we'd had chance we probably would have come up with something [else]." [Student S]

Here again, we can see social influence being exerted. Just as individuals changed their thoughts and behaviours when they saw the whole-group view so they did when they heard the decisions of other groups. It is difficult to know whether participants had a stronger identification with the small-group or the whole-class. There is a sense that each level influences the one below. More research is needed to explore this aspect although such a proposition is partly consistent with social identity theory but we should also allow for context-sensitivity at each level.

The Small Group Discussions

In the second case study, we were able to initiate an investigation into the nature of the conversation in the small groups. The third case study, gauged the small-group discussion through the interviews. Neither of those cases offered enough data to be convincing. In this case study, there was a particular interest to explore this in greater depth.

As before, we gathered data about the small-group discussions from interviews. There was some evidence that participants were using the opportunity to dig into some of the issues that had arisen from their placements.

"When we worked in little small group discussions you were able to delve in depth into what worked and how our sets worked and different elements of planning" [Student E]

To put this in context, we also recorded some of the small-group conversations. In the extract below, the students discuss the continuity of contact they had with their pupils in school. Specifically, they relate this to the effect continuity of contact had upon their efforts to deal with the concept of progression in teaching (the development of an issue over time).

Student A: *“I think for me one of the main things was the progression children make, and it was like where do you take them next, because for me I would go in and teach them literacy one week and numeracy the next week and it’s like differentiation...”*

Student B: *“Yes, well for me, it was that we started something on the Friday and we didn’t finish it off and I just knew I could go in on Monday even though we were supposed to finish it this week and I just knew I had the opportunity to go in on Monday morning and finish it.....”*

Student A: *“Yes because you had ownership of the timetable”*

Student B: *“.....finish it off this week I mean and it’s not having new teachers coming in and like ‘I’m doing this now’ and ‘You haven’t got time to do that. You should have done that on Friday’ and then it’s just a case of fitting it in when you could.”*

Student A: *“Well for me as well progression was something I found quite difficult especially in numeracy because we’d been taught subject knowledge but I didn’t know how to teach numeracy and I didn’t know it until now because she was ‘Right well where do you go to take the next step?’ and because we were doing addition she was like ‘What’s the next step with addition?’ and I was like ‘bigger numbers?’ and she was like ‘No because the progression that they have to do is numbers that add up to 10 because technically when they’re able to add 7 add 3 technically they should be able to do add 77 add 3 it’s like they have to have the secure knowledge to 10 and I thought well I didn’t know that. And just being able to discuss progression with someone...”*

This is much more than an exchange of trivial information. This is work at a professional-level. The students discuss issues to do with ownership, structure, timetable and conceptual development.

In comparing their placement experiences they are moving beyond a concern about one particular placement. They are sharing some of the complexities that teachers have to face when making decisions. They have identified some of the key variables, such as ownership of the timetable (for example), and they note how that can make a difference to what can be achieved in the classroom.

The students are also able to use their own language to share and understand each other's placements. There was some evidence to suggest this is important.

“you don't have to worry about using the correct term or...it was a chance to not have to worry that you're not using the correct language or you could just say it straight or say it as you would every day rather than having to think 'Oh hang on, what word do they expect me to use here?' Yes, you could just say it. You could basically say 'I did this then I did this.'”

[Student A]

Some of this self-consciousness appears to arise when students have to address their tutors to give an account of their placements. Some may be mindful of the course requirements and 'expected' answers. We saw some evidence of that in the earlier quotes regarding answering the tutor-authored answers. It seems reasonable to suggest that the same may be true in the way language is used to different audiences.

The tutor's role is to orchestrate the interaction and manage the shift from small group to whole group and back again.

Each of the case studies had a slightly different structure. Although they all used the same core snowball structure there were differences in duration, differences in the activities within and between sessions. All of these highlight the complexities of facilitation.

In this case study, the students used the two-hour session to review three different dimensions of their placement experience. We also framed this session in terms of the positives that might be identified rather than the concerns which constituted the orientation for the other case studies.

These are all factors for the tutor to consider. In this case, we had to allow for the completion of 3 rounds of Shared Thinking using the core structure. This involved generating 3 different pie-charts. It consequently also involved managing the transition between each round.

There are other transitions to consider such as the move out of small groups and into whole-group discussion. There is also the issue of how long to spend before and after the production of the pie-charts and how to bring things together at the end.

"I think it gave you a clear finish so you created the end-view" [Student R]

It does seem structurally useful for both tutors and students to think about the creation of the pie-chart as a signal that the end of the process has arrived. However, as other case studies have shown, there are many opportunities to elaborate and extend the dialogue after the pie-chart has been created.

Technology is used to generate and display a shared situated understanding.

The idea of documentation is important in this thesis. This is a way of capturing the thoughts and feelings of the group and its membership. The purpose is to communicate inwardly to the group and outwardly to others. This was done manually by the teacher in the Making Learning Visible Project discussed in chapter three. The aim of the Shared Thinking design is to introduce technology to facilitate the process more conveniently whilst avoiding the sense that the session is about technology.

In this case study, we saw some of the impact of making the dialogue public. There is a suggestion that making work public also increased the attention and thought that went into the way the options were worded.

“I think because everybody knew they were going to be presented to the rest of the group visually and also everybody would be interacting with those that they had to be right. Well not ‘right’ but they had to be detailed and accurate.” [Student S]

Observation notes from the other case studies also showed that the way the options were worded was part of how the small-groups were being represented. Again, this appears to relate to the level of identification with the options and the outcomes.

There is a suggestion here that, the shift to a more open way of working prompts greater care. This has a parallel with assessment and the move from private writing to materials that will later be shared. Making the views

Review of Features of the Pedagogical Level

This case study added further weight to the findings of the other case studies and suggested that the process organises the group to work collectively in a process of whole-group inquiry.

The conversational process, the ownership of the session and the co-authoring of the options all fed into the sense of a shared learning disposition that oriented everyone to engage with issues raised. The repeated use of the word ‘engaged’ across these case studies, together with an accompanying emotional response to the sessions suggests that engagement is synonymous with identification.

There was considerable evidence, from the interviews, to suggest that students were listening to each other and that the group as a whole was being heard by the tutors. We extended the earlier case studies to show, in greater detail, the nature of the dialogue in the small-groups. This showed some evidence of a professional level dialogue.

From a tutoring perspective, the tasks of facilitation and the understanding of what constitutes facilitation in this context ranged from managing the movements between large and small group work to handling the transition between different rounds of Shared Thinking in the same session.

This case study also added further evidence to suggest that Shared Thinking articulates the group-identity in order to define the social context of learning and through that, participants identify or engage with the issues (possibly more than if they had information presented by the tutor). The ability to aggregate distributed practices and make that aggregation the focus for development may be an indication of a useful pedagogical solution for the challenges of work-related learning.

This case study also showed the move from sharing individual stories to a group-level narrative. These ‘collective biographies’ are co-authored. They are also democratic in the way they are generated and shared. They also appear to create a new kind of learning resource for those interested or involved.

5.3 The Research Level

The Shared Thinking approach organizes participants to reflect and learn together. The design configures participants in a social investigation of the situated conceptual view. The result of the interaction is the joint production of a visible view of the issues each set one in relation to the other. The display shows both quantitative and qualitative data on the screen. The product represents a shared understanding of the issue in its social context. As such everyone is a researcher.

Features of the Research Level

The reader should note that not all features are discussed at each level or for each case study. By organizing the interaction using the Shared Thinking approach, the key features relating to the research level include:

- A way of investigating the student experience at the collective level
- A way of exploring a comparative view of collective level data
- A way of involving participants as action learners

In the previous case studies, we have seen how we are able to represent the collective experience of different groups. We have also been able to group these products as a way of investigating the journey over a year/time.

In addition, we have been able to show the change in collective opinion that resulted from interaction with peers in a single session. Finally, we have also been able to show a

comparison with the concerns of a 1st year group and the concerns of a 2nd year group in the same faculty at the start of their respective academic years.

A way of investigating the student experience at the collective level

In this case study, we are interested in the possibility of exploring different aspects of the collective experience. Specifically, this was a desire to understand the aggregated placement experience from different angles.

We were also interested in the possibility of comparing the Early Years specialism with the Later Years specialism regarding their placement experiences. It should be noted that all the question-frameworks were set by the tutor for this course.

Early Years Students

In this session there were 3 different phases. Each phase used one round of the core Shared Thinking approach. Those phases were:

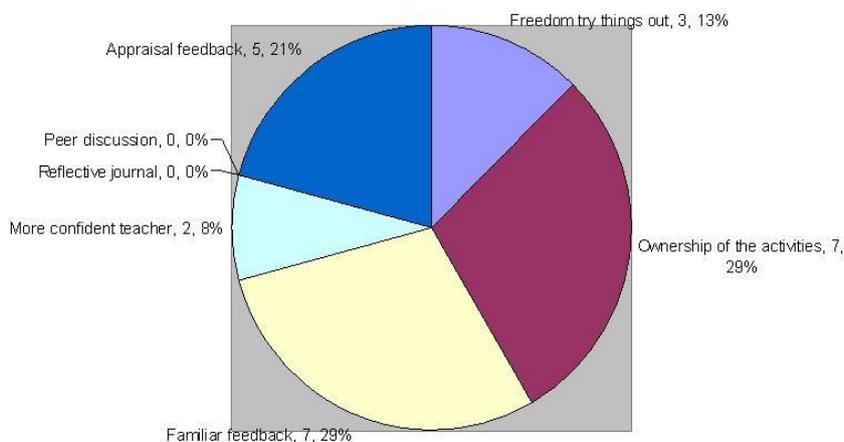
1. Evaluating Practice
2. Improving Practice
3. Future Teaching

Phase 1 of the Session

This phase invited students to look at what part of their placement practice would help them evaluate their future teaching practice. The pie-chart below, Figure 10, shows the output from that first phase.

Figure 10: Early Years Evaluating Practice

What part of your placement experience will most help you when EVALUATING your teaching practice for your on-going teaching?



From this evidence, we can see that all 24 of the participants decided to reject the idea of reflective journals as helpful. However, this is also interesting because it shows that one of the groups felt that it was important enough to be their choice to be put onto the screen.

This suggests that once all the options were generated and displayed then participants, including those in the group that chose that option, rejected it in favour of another option. Each member of that group was persuaded to change their view.

From this, we can see that the individuals in that small group shared their individual concerns and from the available pool they agreed on reflective journals. Then the small group was influenced by the large group.

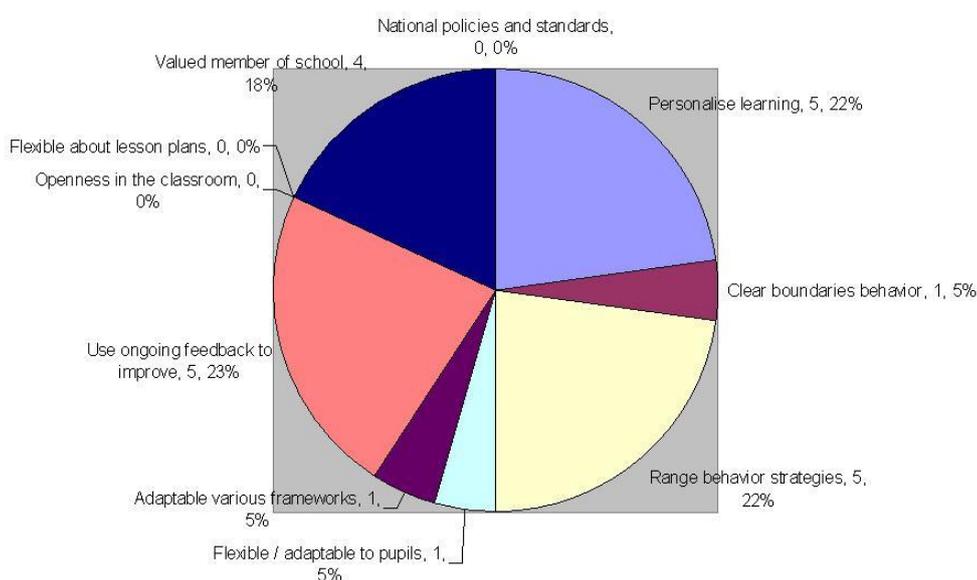
Whilst more research is needed, there is the suggestion that each level is influenced by the next in the hierarchy. We do not know if this is because of alignment to the wider social norms or simply a case of evaluating an increasingly broad set of perspectives. More research is required but it does hint at the way each person is able to use the group –small and large - as a resource for their own reflection.

Phase 2 of the Session

This phase invited students to identify those aspects of their placement experience that would improve their future practice. The pie-chart below, Figure 11, shows the output from that second phase.

Figure 11: Early Years Improving Practice

What part of your placement experience will most help you IMPROVE your practice in the future?



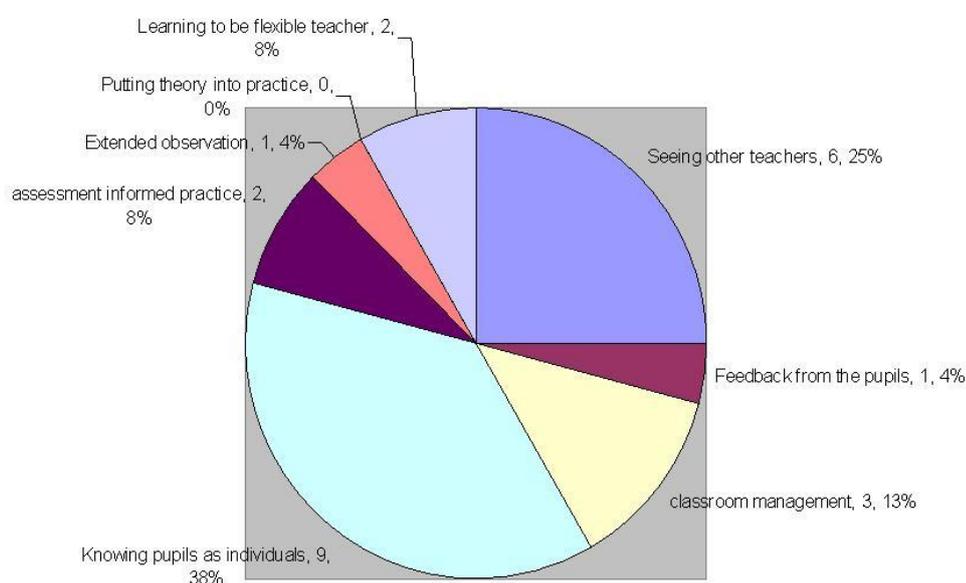
Again, all those options that attracted no votes were decisions made by small-groups. The lack of any votes reflects the abandonment of that choice by the small-group. It is interesting to note that issues related to behaviour management still persist into the final year of placements. We might have expected that this issue would have receded in importance so further research and support might be indicated to investigate that issue in greater depth.

Phase 3 of the Session

In the final phase of the session, students were invited to identify the aspect of the placement experience that might most help them teach a lesson in the future. The pie-chart below, Figure 12, shows the output from that third phase.

Figure 12: Early Years and future teaching

What part of your placement experience will most help you when TEACHING a lesson in the future?



Seeing other teachers was an option that attracted the most votes for this Early Years group. The tutor for the course observed this was ‘slightly surprising’ in the context of the final year of the course. The expectation was that these final year students would have developed a more independent view of their practice.

Knowing the pupils as individuals was also an option that attracted a significant percentage of votes. As there was no group with more than 5 people in it this tells us that people in one group were persuaded away from their group-choice to that of another group. It shows the way that participants influenced each other even before voting.

Later Years Students

We implemented exactly the same session structure with the same question framework. This time it was for students specialising in Later Years.

In this session there were 3 different phases. Each phase used the core Shared Thinking approach. The phases were:

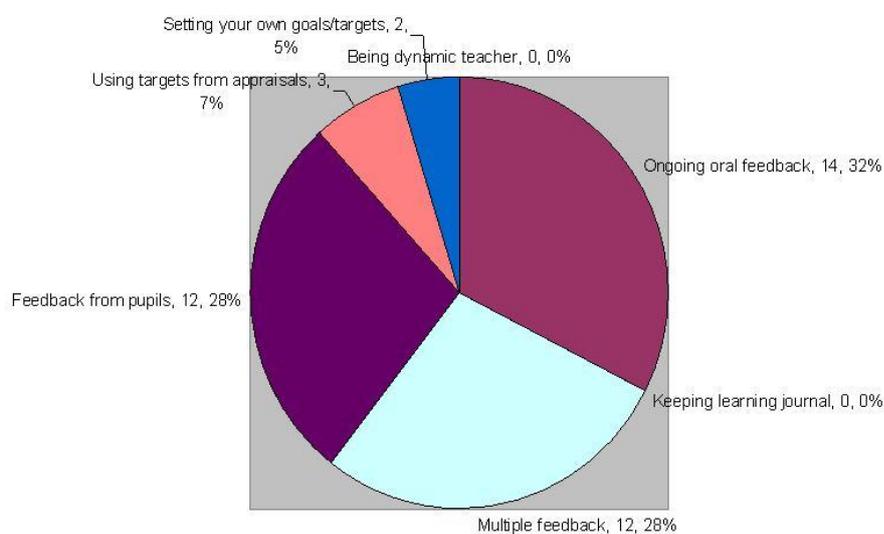
1. Evaluating Practice
2. Improving Practice
3. Future Teaching

Phase 1 of the Session

This phase invited students to look at what part of their placement practice would help them evaluate their future teaching practice. The pie-chart below, Figure 13, shows the output from that first phase.

Figure 13: Later Years Evaluating Practice

What part of your placement experience will most help you when EVALUATING your teaching practice for your on-going teaching?



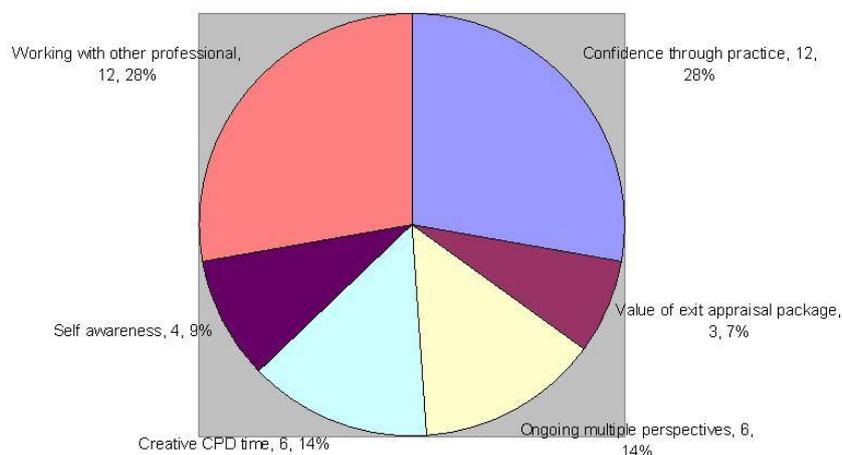
The majority of participants, in this group, thought that sources of feedback would be most helpful. These sources included general verbal feedback from teachers in the school and also feedback from the pupils. Others mentioned that a combination of these, rather than one alone, was important. Although one group identified use of reflective journals, all the members of that group abandoned that decision in favour of another choice.

Phase 2 of the Session

This phase invited students to identify those aspects of their placement experience that would improve their future practice. The pie-chart below, Figure 14, shows the output from that second phase.

Figure 14: Later Years Improving Practice

What part of your placement experience will most help you IMPROVE your practice in the future?



The experience of working with other teachers was valued by this group of students. Equally, this group felt that there was considerable value from practice and that this hands-on experience gave them confidence.

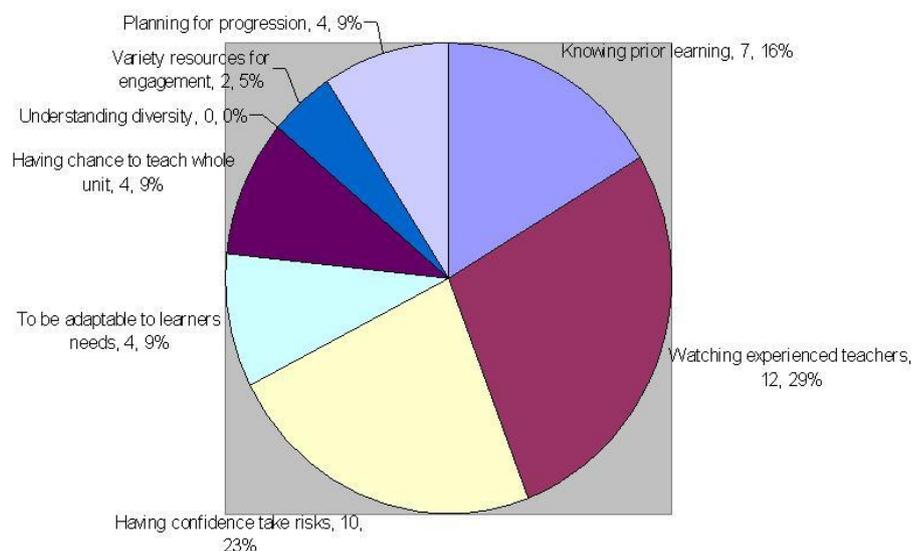
Out of a total of 43 participants more than half - 24 people - chose one of these options. As no group had as many as 12 members this shows us the level of movement and influence that occurs when these participants had a view of all the options.

Phase 3 of the Session

In the final phase of the session, students were invited to identify the aspect of the placement experience that might most help them teach a lesson in the future. The pie-chart below, Figure 15, shows the output from that third phase.

Figure 15: Early Years and future teaching

What part of your placement experience will most help you when TEACHING a lesson in the future?



In the interview with the tutor he expressed some surprise that this group voted for being able to watch the teachers. This aside, it is also interesting to explore the issues that did not attract many votes. Each option was the decision of the group and the pie-chart can be understood as a display of the diversity of issues rather than the search for the most important.

It would be interesting to know why 'understanding diversity' was a decision amongst a small group but something that attracted no votes. This issue was thought to be important when considered against the set of options within the small-group. It was considered much less important relative to the other options in the whole-group. Each of these issues could easily constitute the basis for another session.

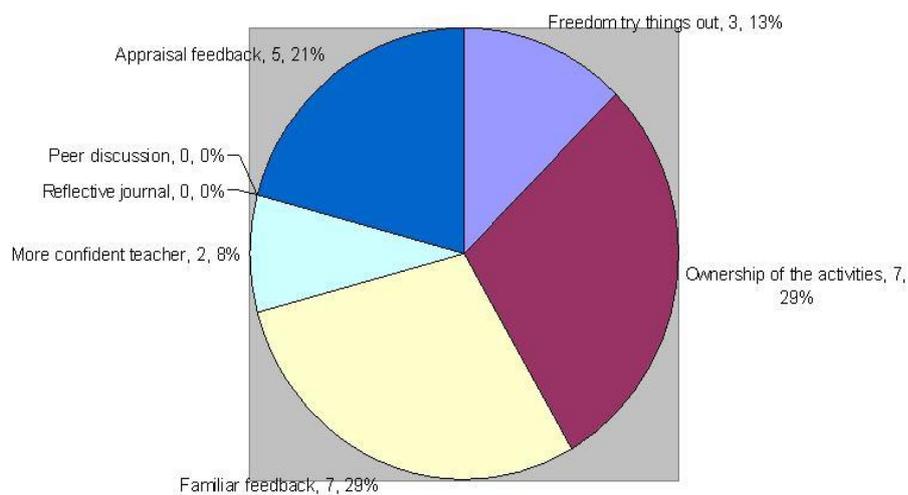
A way of exploring a comparative view of collective level data

By grouping pie-charts, as below in Figures 16 and 17, it becomes possible to compare and contrast the issues of collective concern to the Early Years and the Later Years students. Remember these are students on the same course in the final year.

Figure 16: Early Years and Evaluating Practice

Early Years

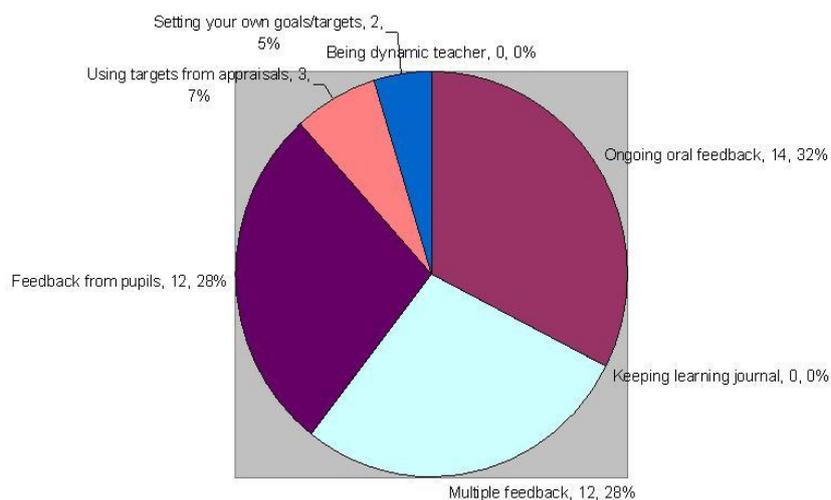
What part of your placement experience will most help you when EVALUATING your teaching practice for your on-going teaching?



Later Years

Figure 17: Later Years and Evaluating Practice

What part of your placement experience will most help you when EVALUATING your teaching practice for your on-going teaching?



We can see how much more important feedback was to the later years groups when compared with Early Years students when evaluating their practice. We can also see how reflective journals were raised as an issue in both sessions. However in both cases it attracted no votes.

For the Early Years group control and ownership was an important factor. For the Later Years group setting your own goals, the nearest related topic, attracted few votes.

There is a great deal of investigation that can be done by comparing these pie-charts for each issue. Even the visual difference between the charts when shown on the same screen can have an immediate impact as a signifier that change has happened. Interestingly, this can be done as part of a session and this becomes another part of the pedagogical armoury for the facilitator.

As researchers it is also possible to look across all 3 pie-charts for a single group. This provides a way of understanding the placement experience in an elaborated way. This set of pie-charts provides a rich resource for exploring teaching placements and the journey through a course. It also gives us both qualitative and quantitative data for these journeys.

This approach also flags up the ability to use these resources to better understand the collective student experience of a course design. Too often course designs are represented in terms of their architecture and structure. Too often these designs miss out on the *experience* of the design and assume the same outcomes.

A way of involving participants as Action Learners

The following extract from one interview suggests that Shared Thinking may be supportive of participants as co-learners.

Student: "Yes the thing that gets me about module evaluations is I understand it's a post-experience thing. We reflect on the experience we were given that we have but that has no bearing on us it's the people behind us that are getting our evaluations if you know what I mean. And that's one of the things that gets me that it all seems to look backward."

Researcher: "So you didn't feel that you're reflecting for your own benefit but for the possible benefit of those that follow you?"

Student: "Yes. Yes, I mean I believe it's a good thing for the next lot of people because if you think about it another way the people before us were evaluating to help our experience get better and so it's kind of passing the buck down sort of thing do you know what I mean. But I think some people and some peoples' attitudes are 'What's the point of filling this in? This has no gain for me...I think there are times and other people sometimes think 'well what is the point?'"

Researcher: *“So do you think this session we had was for your own benefit then?”*

Student: *“Well yes it was. I think, well actually, you know what, I think it was.”*

This quote provides some evidence to suggest that students may experience evaluation and surveys as having little value for them. There is a sense of participants being ‘research-fodder’ for tutors and others.

It is equally interesting to note that this participant felt that there was a reward for them in participating and this may well explain the emotional response and a higher level of engagement when compared with tutor-generated options.

Review of Features at the Research Level

This case study shows how we can investigate the collective experience by aggregating the student-generated options from small-group conversations. These small groups also distil the individual inputs into a group-decision.

Individuals are not obliged to vote for the group-choice and as a possible consequence of this they often change their allegiance from the small-group decision to another. If the small-group choice was not that of a given individual that person can still put all options into a whole-group view. In that respect it seems that each person can use the group as a learning resource.

This case study has shown how we are able to compare 2 groups on the same course. It also shows how we can investigate placement experiences in considerable detail exploring different dimensions of collective experience.

These electronic documents are a meta-level construction conceptualised as collective biographies. They show the experience of a whole-group at a given moment in time. They are simultaneously resources for pedagogy as well as for research. They are also resources that allow equal access and that configure participants as co-researchers. This appears to be reflection and evaluation with benefits for participants as well as others.

Others have expressed concerns about the difficulties in being able to address and manage work-related learning in ways that fit with the values and goals of higher education (Lester and Costley 2010). Others have argued for a more social approach to work-based learning (Siebert, Mills et al. 2009). I would argue that Shared Thinking provides a process, pedagogy and product that can address those issues effectively and efficiently.

6. Discussion

We began this case study with the problem of finding a process by which students could reflect on their placement experiences together. This case study appears to offer one way forward for a classroom full of students to share experiences in a structured manner.

More importantly, the findings reported here point to two important points:

1. The impact of education based on social isolation
2. The impact of education based on a relational approach

There are issues about finding the ideal balance between individual and social activities but within this process social isolation appears to risk the development of uncertainty in the

minds of students. That uncertainty appears to relate to self-doubt about personal competence and this may lead to a sense of anxiety.

In contrast, the ability to have conversations with peers undergoing a similar experience seems to provide a basis for developing thought in relation to the peer-group. The social context appears to provide a basis for understanding the meaning of professional terminology as well as offering the chance of new ideas. It also seems to potentially resolve some anxieties by articulating common ground amongst the participants.

Further research is needed to substantiate these claims and particularly to investigate the applicability of this relational approach for different subjects and not just for support. There may also be situations in which anxieties may be increased if an individual feels the pie-chart communicates a sense of distance between one person and the group.

The quote below is but one more example of the rarity of formal opportunities for reflective conversations in higher education. It also suggests that the trend towards increasing flexibility may have a downside as well as many advantages.

“It was quite nice to have that session especially since it was our last placement where everyone could like share their ideas and talk about what they got up to and how they felt. They were all positive about going into a job.” [Student E]

At the pedagogical level, this case study provided some evidence that it was possible to organise a reflective dialogue about individual teaching placements in a classroom. We also saw the framing question being framed in a positive way as a pedagogical strategy. We cannot know whether a general satisfaction with the process amongst the participants is attributable to factors within the group or if these outcomes are directly and solely attributable to the use of the Shared Thinking process. More research is required.

We are able to see how it is possible to do three cycles of Shared Thinking on different aspects of placement experience. This suggests that it is possible to use this approach as a way of exploring placements in some depth using different aspects as the basis of discussion.

We were also able to see inside the small groups and understand something more about the nature of their conversations when applying this kind of approach. There was evidence to suggest that the process could facilitate some relatively in-depth dialogue. There was data showing how participants related abstract issues to their practice experience in those discussions with peers. This suggests that the conversations may have been worthwhile and not simply a tool without a useful product.

The start and finish for the discussions were open and it seems that one consequence of that is the way in which the students felt as if they owned the session. Participants reported that they were engaged with this process. This engagement was repeating data from earlier case studies when tutors were reflecting together.

In the first case study of this thesis, we were able to show collective change over time for the same group of students. We used that as a pedagogical tool in that case study. This case study appears to deepen this by showing how the Shared Thinking process might be used to explore diverse dimensions of collective experience. In doing so, we can develop our view of the pedagogical repertoire made available using this approach.

At the research level, this case study shows the collective experience of a group of final year students after their final teaching placements. It constitutes a shared narrative from their individual stories. In this way, we can reasonably argue that the sharing of individual stories and experiences is a process that generates 'collective biographies' (Davies and Gannon 2006; Weiner 2008).

These documents provide a major resource for research into the collective level of student experience. They are co-authored by the groups and they are able to portray the diversity of experience within a group. At the same time, the participation in the discussion and the voting, as well as the data presented above, suggests that the resulting products are also representative of the group. They can be seen as ‘socially authentic’ (Hegedus and Kaput 2002).

Clustering these collective biographies in different ways offers new possibilities for researchers. It allows us to compare group experience across different dimensions of placement experience.

Schon’s framework (Schon 1987; Kemmis and McTaggart 2003) is effectively a temporal model of reflection (before, in and on action). It may be that the Shared Thinking process might do something similar for groups. In so doing, it appears possible to widen individual thinking by providing an expanded resource. This seems to be a meta-level view of a particular issue that is made available to each participant.

In the next chapter, we will look at the idea of professional development for Shared Thinking. There I will offer a case study of academic staff in a university department. Shared Thinking was used to explore assessment policy and practices in the department.

Chapter 9: Case Study 5 – Review of Department Assessment Practices by Academic Staff

1. Introduction

In the earlier case studies, I described the emerging effects of social isolation within learning and teaching practice. It was apparent that many participants did not have access to a representative view of the social context of their course peer-group. Many students were aware of the views of a few close friends but little more. This seemed to cause some anxiety and self-doubt amongst some students.

I noted that students appeared to be influenced by their perceptions of values held by their peers. In the first case study, we noted how one participant perceived their peers to be unlikely to use support services. The consequence of this was that despite having the need for such services that person avoided the available help.

In the third case study, students instance second year students had maintained the view that they were alone in holding a particular concern since the start of their course. When the group-view was generated and made visible some students adapted and changed their thoughts and practice.

The fourth case study highlighted the way that students on teaching placements were isolated from each other. Participation in the Shared Thinking process prompted one person to understand the way professional terms were being used by her peers. That person re-evaluated their way of understanding the term. The consequence was the interpretation of the term was changed into an expanded concept with new referents.

In all these case studies the common theme appears to be social influence. The views of the peer-group mattered to participants. Those views can be said to be salient and

representative. As a consequence they appear to have a greater impact through group-identification. Would it be the same with academic staff?

In this final case study, I look at a group of academics in a university department. These participants collaborated, using the Shared Thinking process, in order to review assessment practices.

2. The Case Study Context

This case study brought together tutors from the same academic department at an ‘old’ university in England. The term ‘old’ is used to denote a university that was formed after 1500 A.D but before 1992.

This department was a Business School. They were already interested in supporting large student groups with technology. They often had lectures with around 500 students. They were interested in the technology to increase their engagement and the ability of the tutors to gauge student understanding of the material being presented in lectures.

These tutors had an interest in exploring new technologies. They had some familiarity with the use of voting technology but believed it to be rather ‘simplistic’ in nature. When contacted by the researcher, the tutors were interested in participating in an experiential workshop. This would provide a way of exploring and understanding the technology first-hand. I saw this as an opportunity to see whether or not this process might be useful to the development of a department as a professional learning community.

The idea was that this workshop would provide a professional development experience. It would address this on two levels. Firstly, it would be professional development to do with assessment practices in the department.

Secondly, it would be a professional development activity that would seek to help participants understand and explore the broader possibilities for using voting technologies via the Shared Thinking approach. An important part of this workshop would also be to explore how to provide the experience and then how to evaluate it together.

3. Case Study Participants

This case study involved a group of academics in one academic department. Most of the participants had been employed in the department but there was at least one recent arrival (one of those interviewed). There were approximately 12 participants in this session. Two participants were interviewed from this session.

4. Research Methods

Ethical approval was requested and gained for the research activity. Participants were asked to register their names and email addresses as they came into the room. After the session had ended they were each sent one email to invite them to participate in an interview.

Two participants mentioned they would be willing to be interviewed. By coincidence they were attending a conference where I was also presenting a paper. The interviews were carried out at the conference.

Each participant was briefed about the ethics and given contact details of the research supervisor should they have any concerns about anything arising from the interview. The interviews were recorded using a handheld dictation machine.

The interviews were semi-structured. The different stages of the Shared Thinking session structure was used as an organising framework for the interviews. When issues of interest to either the researcher or the participant arose, space and time was given to exploring that issue in more detail.

Data captured through the technology was also analysed. All the data was set within the structure of the session. Later the data was re-organised into the 3 main themes of individual, collective/pedagogical and research.

4.1 The Case Study Procedure

The technology was to be used in two modes. The first of these is the Shared Thinking approach to the use of voting technology, for reflection. The second of these is the conventional use of voting technology, for teaching.

The activity structure for this case study

- One round of Shared Thinking on Feedback and Assessment
- Evaluation using readymade questions and Voting Technology
- Review and Close

The session lasted 2 hours. The activity structure for this case study was:

1. Introduction & Overview of the research and the aims of the day
2. Individuals write down their concern regarding assessment
3. Move into small groups to share concerns
4. Each group to select one issue to go onto the screen
5. Each individual to vote on the issue they saw as most important
6. Plenary on the outcomes and the process
7. Three evaluation questions with readymade options for voting
8. Review the session and close

There were four main sources of data:

1. Pie-Charts from the session focus
2. Evaluation Data from voting technology
3. Recording of small group discussions
4. Interviews with 2 participants

5. Data Analysis

The approach used to analyze the data is described in detail in chapter four. Three levels of impact were used to structure the analysis. They are:

- The Individual Level
- The Pedagogical Level
- The Research Level

5.1 The Individual Level

Features of the Individual Level

The reader should note that not all features are discussed at each level or for each case study. By organizing the interaction using the Shared Thinking approach, the individual level features are that this will support:

- The possibility of cognitive change through perspective-taking
- Emotional benefits from sharing and dialogue with others
- Greater socialization facilitated by dialogue and interaction.

The possibility of cognitive change through perspective-taking

The comment below suggests that guidelines given in writing to new staff arriving in a department may not be adequate to cause a change in practice. This suggests a difference between having information and understanding the cultural context into which the individual is to fit.

“Well I think different academic contexts that I’ve taught in there’s been very different kind of demands on what the students are expected to receive in terms of the feedback and the assessment and just reading the departmental policy doesn’t really make it clear to me anyway where that’s going. [Tutor 1]

There is some resonance here with the earlier case studies which looked at induction and transition. In those earlier cases, we saw how being presented with ‘facts’ was potentially received in a different way to issues jointly generated by participants. The above quote suggests that the peer-view may be important in defining how terms are to be understood. Without such an understanding, it seems that individuals may be unlikely to change their practices.

It may be that participating in the generative process that gives rise to the issues is significant. As one student noted in the previous case study, it may be that they are better able to explain the issues on the screen because of understanding the social context.

The comment below suggests that the process helped to add detail to the information that may have already been provided in the policy document supplied by the department. It seems that the process may have also contextualised information to give it meaning.

“As someone who is a relative newcomer to the department, I think it was useful in terms of understanding the kind of practice that was expected in a bit more depth. I guess that’s where it’s taken me personally.” [Tutor 1]

It seems from the comment below that the discussion helped to locate the emergent issues within the immediate professional context of the department and the tutor peer-group. For this new tutor that was enough to change his practice.

So, having that discussion and seeing different people's interpretation of what is happening at the moment and where they wanted to be, made me think about how that effectively should be what I do." [Tutor 1]

From this, we can see how the process, and the visualisation of the different situated views, prompted a shift as this tutor begins to align the way he thinks about his practice to that of the department. As with the students in the earlier case studies, the new tutor compared or related his current perspective to that of the tutor-group of which they are a member.

This seems to add further weight to the notion that participation in dialogue and interaction with a social group may prompt individuals to relate their thoughts and feelings to those of the peer-group. We cannot be sure how much of this depends upon the visualisation and voting process and how much is attributable to having a discussion about the issues.

Emotional benefits from sharing and dialogue with others

In each of the other case studies there was evidence to suggest that the Shared Thinking process had an emotional as well as a cognitive impact. Participants appeared to draw comfort and some confidence about their abilities as a consequence of seeing and discussing views with their peers.

Another feature of previous case studies was the repeated mention of being 'engaged.' The comment below showed similar evidence to support the idea of the Shared Thinking process as engaging.

"I can remember people enjoyed it and engaged with it and I reflected on that and I think ... what happened on that event was because you were really using it for collaborative group work, collaborative thinking, collaborative decision-making it

made us think that perhaps there is more to this tool than appears at first sight. So that was exciting.” [Tutor 2]

It is still unclear what the term ‘engaged’ really means in this process but it is a point made in the other case studies, such as the second case study. It may imply a sense of identification with the group and its views. It may be because the issue is important to all of them.

The above comment seems to suggest an awareness of working together as a feature of this process. One outcome of that appears to be that it was also enjoyable as an experience.

There is a distinct sense of recognition that the session generated a sense of working together. That sense of togetherness seems to have permeated each part of the process and they clearly evaluated it against their earlier conception of this technology.

The comment below suggests that one tutor took a comparative view of their participation in this event compared with the conference at which that person was interviewed for this research. In comparative terms, this tutor appeared to feel more involved in the Shared Thinking process.

“Well I was engaged, you know, I wasn’t on my mobile as I was in this conference. So, it was very engaging.” [Tutor 2]

Greater socialization facilitated by dialogue and interaction

One of the features emerging from the previous case studies is that some of the participants mentioned the effects of what might be termed as academic isolation. By this, I mean that there was a tendency to reflect and learn alone.

I mentioned some of the outcomes of being academically isolated which were that participants held on to perceptions that may be inaccurate and that these may be a cause of distress or anxiety. It also meant that, in contrast, they might miss out from socialisation and new ideas.

It seems that information may need to be sufficiently representative of the social group to be regarded as reliable. Only when it was representative did it appear that individuals might adjust their practice.

In the previous case study involving student-teachers, the students appeared to know the views of only a few friends. Similarly, in the first case study, we noted that at least one student mentioned never having had a chance to discuss their experience of the course with their peers.

The third case study was similar. There we saw a second year student who had maintained a particular view of himself as the only one having a particular concern. These appear to be all cases of a similar phenomenon of academic isolation. The comment below suggests that the same was true for one tutor in this case study.

“I guess the most common way is talking about various problem cases with colleagues. So, it may be meeting in an informal way with colleagues or knocking on each other’s doors ...That kind of discussion you know on a kind of a one to one basis.” [Tutor 1]

It appears that students and tutors may rarely have whole-group discussions. Those that can generate a sufficiently representative view of issues in their social and professional context may be even rarer. As a consequence it may be difficult to get the collective picture of their immediate context.

It seems from all these instances that this social and psychological isolation is an issue in education. It may be that this Shared Thinking process achieves most by helping to

facilitate those reflective conversations. The outcome appears to be comforting and a spur to change towards the socially situated norms.

We could argue that the above tutor changed his practice as a consequence of being made aware of the prevailing norms in the department. These were the norms discussed and made visible in the session. We know that talking informally with colleagues, in one-to-one conversations was not enough to cause that same change.

We can speculate that either the other tutors, in those informal discussions, were similarly unaware of the prevailing norms or that communication from one member of the group may not be enough for an individual to risk changing their practice. This suggests that the level of trust in information may be a product of identification but also may be influenced by the extent to which information is perceived to be representative of the group.

It seems that when information is authentic to the group, i.e. representative of the group and the views of its membership individuals may invest in changes to their practice. Similarly, it seems that when people are academically isolated they may not change and may also suffer anxiety or stress. More research is required to investigate these variables.

This helps to support a case for the development of learning communities. Implicit in defining such a practice is the involvement of members in discussions about issues that are important to them. It may also be helpful to facilitate the co-authoring of a representative view on a given issue.

5.2 The Pedagogical Level

The aim in this case study was to make the pedagogy part of the ‘content’ of the session. In this context, these tutors were interested as much in the technology and the Shared Thinking process as they were in the issue of assessment policy. From the researcher’s

perspective, we were also interested in exploring the idea of using this case study to develop a professional development workshop.

Features of the Pedagogical Level

The reader should note that not all features are discussed at each level or for each case study. This is because data was not gathered for every feature in each case study.

Based on work done elsewhere, using handheld devices in mathematics, for whole-group inquiry (Stroup, Ares et al. 2004; Stroup, Ares et al. 2005; Stroup, Ares et al. 2007; Carmona and Dominguez 2008), the Shared Thinking pedagogy should include at least some of the following features:

- Participants work in a whole-group enquiry
- The start and end is unknown and determined by the interaction of those involved
- Participants are caused to talk and listen to each other
- The tutor's role is to orchestrate the interaction and manage the shift from small group to whole group and back again.
- The tutor's role is also to support the development of a shared and situated understanding of the issue
- The tutor's role is to listen as much as to talk
- Technology is used to generate and display the group-situated norms. This shared understanding needs to be valid as an authentic representation.

Participants are caused to talk and listen to each other

In the second case study, some work was done to investigate the nature of the small group discussions. That case study looked at a group of learning-support tutors. In the fourth case study, we looked in greater depth at these small-group conversations and discovered that the students entered into a professional level dialogue.

What might be the nature of the small-group conversations amongst a group of academics in a university department? This discussion looked at the current concerns to do with assessment in the department. One small-group discussion opened as follows:

Participant 1: *“I just wrote timing of feedback. That’s what students want from us.”*

Participant 2 *“I put timing and a few other things such as make sure it’s helpful and useful feedback”*

Participant 3: *“I put wanting to reduce the amount of work which is mechanistic in terms of assessment...looking for more scope to do something around deep learning.”*

It is clear from this opening passage that there are quite different views within the group. The opening comment is rather plainly expressed as a way of opening the discussion. The second comment offered a different idea and that person gave an example to support and clarify their point.

By the third comment, value judgements are appearing in the exchange. This 3rd participant sets out the conceptual terrain by comparing a reductive view of the process with the search for something that might offer a richer experience for participants.

In this opening exchange nothing has been made overly concrete or detailed. The discussion is still quite general. These are candidates being identified as a possible group choice. At this point timing, helpful/useful and deeper seem to be the main options. In the next section, we see how the conversation develops from this opening exchange.

Participant 1: [to participant 2] *“So what did you mean?”*

Participant 2: “.....I think we need to think, “Does it add up to whether we’re assessing these things in the right way?” and “Does it add up to something that’s coherent as an assessment strategy?”

At this point, one of the participants seeks a way of taking the initial conversation further. That person asks one of the other discussants to explain in more detail what they meant by their opening remarks.

The idea of making assessment and feedback more helpful and useful, in this discussion, actually relates to strategic level issues. In other words, this person seeks to understand how closely each tutors’ practice is fitting into a coherent sense of a shared practice within the department. The following section shows how this develops in the subsequent exchanges.

Participant 4: “We need to look at the outcomes at the programme level and having set them we need to see they’re being met and I think that’s where we’re losing the plot a little.”

Participant 2: “I do”

Participant 3: “It might be that we do the sort of easy changes in terms of tutor workload and focus on.....”

Participant 4: “We tend to look at it like we only need to do that bit here and that bit there rather than demonstrate how each module meets the programme outcomes. It sometimes just seems to be a bit upside down.”

Participant 1: “Yes but it’s the university system that’s at fault. It forces us down that approach.”

Participant 4, above, picks up on this idea of working collectively and discusses possible specification of outcomes as a benchmark for guiding their practice – both individually and collectively. We see some agreement emerging from this suggestion. Participant 3 starts to introduce the idea of a place to start. This leads to the suggestion of doing the easiest changes in order to make some early progress towards changing practices.

Before any specific starting points are identified, participant 4 comes back again with an observation about current practice. This person notes the way they seem to work within the department. The key point expressed by this person is the way that change appears rather piecemeal from the ground-up and in rather unpredictable ways. The feeling suggested here is of irritation at the lack of a managed approach.

At this point, the first person to speak in this group comes back with an observation that this may be true but the causes lie outside the department. This person believed that changing priorities within the university causes reactions at the department and practitioner level.

From these extracts, we can see the discussion has ranged between individual concerns and practices; through to department-level issues; and going up as far as institutional level views. It appears that the dialogue in small-groups addressed assessment at the level of both policy and practice. The dialogue shows tutors participating in a meta-level dialogue relating to assessment. The activity appears to be socially-authentic. The discussion related to their situation.

The extract from the recorded small-group discussion suggests that various topics were considered. There was support for this from one of the interviewees.

“I think that we had quite diverse ideas from what I remember and that expanded out so it took us a long time to settle on a choice of a particular answer. We were discussing lots of different things that weren’t necessarily related to the topic in question but were part of our decision making process.” [Tutor 1]

As we saw with the student-teachers, the small group conversations had considerable depth to them. There was also enough time or structural flexibility for the conversation to include a variety of topics and this may be necessary before a group-decision can be reached.

I think by the time we got to the end of that and we had something it felt like it was the group's idea and it all fitted together. It took on a number of different perspectives even if it wasn't, in the phrasing of the question there was some understanding there.” [Tutor 1]

This last point made in the above quote is also interesting. There appears to be a difference between the words on the screen and the understanding that participants have about that which is signified through the language. This may be why the policy document handed to this new tutor had little meaning. He did not participate in its construction.

This relationship between language and shared understanding is also pointing back to the fourth case study. In that instance, one of the students mentioned that the display of votes was representative. She also said it was a list of options for which she felt able to explain each one. These small examples highlight a relationship between recorded language and situated understanding.

A bridge appears to be required in order to understand the text in an article or with readymade questions. The reader is involved in making sense of a text in their own context. For individuals, this means understanding the implied referents. In a social context the need is to understand a social category with socially shared referents. The Shared Thinking process appears to help participants establish the shared referents such that when they are captured they retain a shared sense of understanding.

The tutor's role is to orchestrate the interaction and manage the shift from small group to whole group and back again

Education in the west is largely premised upon the idea of competition and participants are viewed as individuals in a class. This may be for practical or historical reasons. It may even suit some individuals who prefer not to participate in group activities seeing them as unproductive or even dysfunctional.

The idea of making learning personal is in tune with an individualistic conception of learning. However, there is some evidence that the way to make a session more personal is not to try and accommodate all possible learning styles but to make it contingent with the way students are thinking. If we regard learning as a matter of social identity then this is not just a matter for the individual.

“I think what stood out for me, was it's structured and at a personal level for me I tend to jump to the answer so that process was a little bit frustrating but at the same time it made me think – which is good.” [Tutor 2]

I would speculate that, part of the reason the process is repeatedly seen as ‘engaging’ is to do with identification with the group through the dialogue and the display of options and votes. The process appears to be making a bridge between how the individual understands the issue and how the group articulate that issue. Where the issue is salient and the group is significant then the matter is personalised – for each individual. That is, the issue is in the mind of each participant and they have recalled their own category contents for comparison with the group of which they regard themselves each to be a member.

It may be that where identification is strong and the issue is current then the dissonance is as much to do with reconciling dissimilarities as to do with learning styles. Again more research is needed to understand this in greater depth.

Leaving this aside, the tutor's job is to manage a series of steps, allowing appropriate time at each stage. This can be experienced as frustrating and it appears to demand more thought and engagement with the issues raised. If this can be achieved then it appears that there is some evidence that participants change their view or have greater confidence in their view.

The difference case studies have revealed pedagogy for this process of whole-group inquiry. There is a variety of activity structures that have been discovered and tried in different settings with the same reports of people feeling engaged – both emotionally and cognitively. The tutor's role can be seen as growing in potential complexity across this set of case studies. However, the tight structure has some flexibility within and the display of student-generated issues weighted and made visible provides a shape for a contingent response. In this sense there is complexity but some support within the process.

In this sense, Shared Thinking has offered a new 'mode' for working as a whole-group supported by the use of classroom technology. The tutor no longer sets the agenda but is able to frame and manage the session in different ways. The students co-construct and then communicate the agenda back to each participant and outwardly to tutors and mentors etc. This is different from the idea of using these new classroom technologies to survey an audience which is the traditional mode of use.

In the context of the discussion of this section on the tutoring role, we can see how the orchestration task is extended to include a shift in the different modes for using this technology. This is in addition to the management of different activity structures, different sessions, different respondents etc.

Review of Features at the Pedagogical Level

The goal of this session was partly to explore the value of the Shared Thinking process in a different context. We had implemented it for students and for support staff in the earlier case studies. In this instance, we applied it to academics in a university department.

The other goal of this case study was also to investigate the utility of the structure as a staff development session. The aim was to make the structure clear whilst also addressing an issue that was important to the group.

As part of this, the goal was to differentiate between the conceptions held by the participants regarding the usefulness of voting technology and the possibility that more could be done with the technology. The session appeared to achieve those goals. The evidence for this feature is provided by the responses of interviewees (above) and that, as a direct consequence of the session the department bought the equipment.

In this case study, we mixed different modes for using the technology. A sequence of Shared Thinking was followed by the use of the 'traditional' mode to evaluate the session with participants. This provides us with a participative approach to evaluation but it also extends the diversity of activity-structures combining different modes in the same session.

Perhaps one key difference is that evaluation carried out using voting technology has a shared reward. In case study four (chapter eight), we saw the perception of one student who noted that this felt like 'evaluation for us.' This feedback is still useful for tutors to help them evaluate courses but it may have equal and simultaneous benefits for the participants. This is evaluation with them rather than something done to them.

This case study looked in detail at the nature of the small group discussions. These discussions are limited in duration. They also form only one part of the overall session.

Despite this, these small-group sessions appear to provide a space for conversations of some depth and seem to be useful for sharing perspectives as well as for socialisation.

In case study 2, discussed in chapter 6, we had brief view of some of the conversations that happened around the use of Shared Thinking. We had a more detailed view in case study 4, discussed in chapter 8, with the trainee teachers. In that last instance we saw that the discussions had considerable depth and brought out a professional-level of conversation.

In this case study, we can see how wide-ranging the discussion was amongst tutors. They shared practices and views that ranged from the individual level all the way up to the institutional level. The task of summarizing them and forming them into a view to be communicated to the rest of the group is no mean feat.

Putting these things together provides a useful view of the richness, the engagement and the effort that comes out of these sessions. The tutor has a significant job to manage the shift from one level to another. There is also the task of managing the movement back into groups and to this we have added mixed mode sessions. There is however a number of support mechanisms contained within the process. These include the tight-structure which retains some flexibility. It also includes a shape provided by participants that scaffolds the respondents.

5.3 The Research Level

It seems reasonable to suggest that the Shared Thinking approach organizes participants to reflect and learn together. The design configures participants in a social investigation of the situated conceptual view. In this case study, we explored the situated view of academic tutors around the topic of assessment policy and practice.

The result of the interaction is the joint production of a visible view of the issues each set one in relation to the other. I am increasingly arguing, in the context of this thesis, that this is the making of a group and that these documents – these collaborative biographies – are the situated identity for that group on a given social category.

We are therefore involved in research into the group and its shared understanding of a given issue. We have also moved on to regard this as an investigation into the social influence that resides within the group and that appears to be exerted upon each individual that belongs to that group.

Features of the Research Level

The reader should note that not all features are discussed at each level or for each case study. By organizing the interaction using the Shared Thinking approach, the key features relating to the research level include:

- A way of investigating the student experience at the collective level
- A way of exploring a comparative view of collective level data
- A way of involving participants as Action Learners

A way of investigating the student experience at the collective level

In the other case studies we saw how we were able to investigate the learner experience at the collective level. In case study 1, we could see how student experienced different years of their course.

In case study 3, we did the same for students at an ancient university. In chapter 6, we saw how we could investigate distributed experience for support staff in different institutions. We did something quite similar for students in chapter 8 as they reviewed individual work-placements.

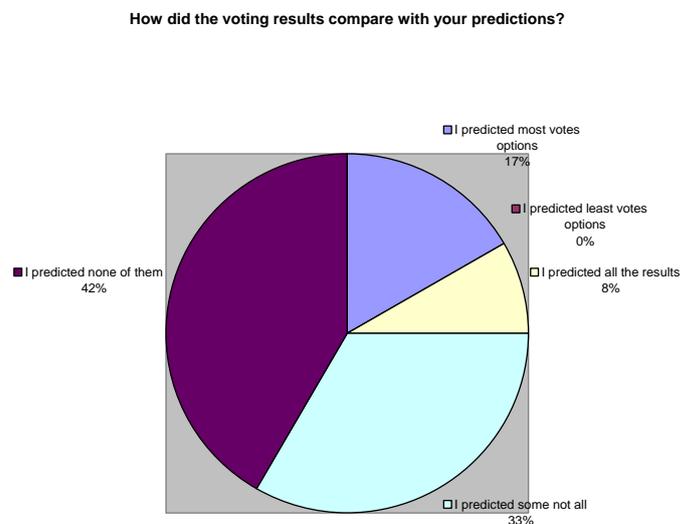
Also, in case study 1, we looked at the experience of students being mentored. In this case study, we looked at the experience tutors had related to assessment and feedback practices. We also looked at the collective experience of the Shared Thinking session. We used the technology to evaluate the process as a whole-group.

In this case study, we were also able to explore the extent to which individuals could predict the outcomes of the votes. This was intended to help investigate the extent to which the participants understood each other. If they did not understand one another there were some implications for developing a shared practice.

The pie-chart below (Figure 18) shows the extent to which participants felt that the outcomes of the vote were predictable. Underpinning this question was the belief, in this thesis, that learners seldom have a wide enough view of their social context and that this may undermine the level of confidence, in the social and situated context, needed to change their practice.

The case studies in this thesis suggest that individuals tend to have a quite limited knowledge of the views of others in their particular social context. Those case studies also suggest that most people develop their views based on a mixture of their own thoughts or in discussion with a small number of friends, peers or colleagues. Consequently change is slow. In a related manner, these case studies show some evidence that given the larger view of the social situation they often change their thoughts and behaviours.

Figure 18: The Predictability of Voting Results



There are some weaknesses in drawing conclusions from this data. This session did not include all tutors in the department. The data is only representative of a sub-section of the department. It may be that this sub-group of tutors did not have a current understanding of the whole department or that others did.

Some of the other case studies suggest that participants failed to predict the views of others because they would otherwise not be surprised that others shared particular concerns. Equally, for some of the more experienced participants in a given context there were few surprises from the group. This suggests time spent with the group is a key determinant of familiarity with the social norms. This is as we might expect.

In this instance, only 8% reported that they could have predicted all the responses from their colleagues. A third felt they could have predicted some but not all of the responses and 42% said they could not have predicted any of the responses.

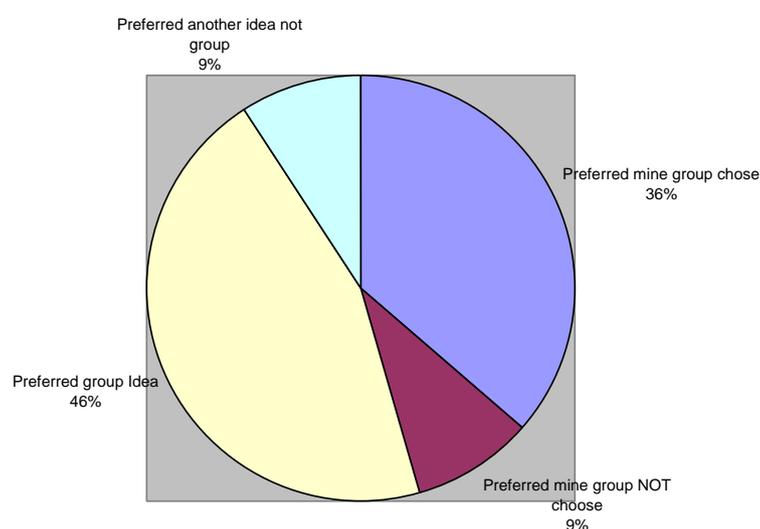
Further research is required to understand whether the issues were predictable but the distribution of the responses was not. We do not know the nature of these results in real detail so again further research is required.

The Group impact on Individual Thinking

We also sought to investigate how much influence the small-groups had on individual thinking. Within this, I wanted to try and pinpoint the moments of impact. Was the main departure from an initial position happening before or after the small-group discussions? The pie-chart below (Figure 19) shows the outcomes of this vote as an attempt to investigate this issue.

Figure 19: The influence of small group interaction on individual thinking

After your small group discussions, how did you feel about the idea you wrote down at the very start of the session?



The results suggest that 45% of participants still preferred their own choice after the small group discussion. This was the total when we disregard whether or not their personal suggestion was adopted by the group. It seems, from this, that just over half of the

participants were influenced by the discussion in the small group and through a comparison they changed their own view towards that of the group.

We do not know the precise reason for people changing their view. For example, another option may have appeared more relevant to the department. They could equally have been persuaded that another issue was more important as an issue for their personal development.

A simpler explanation is that participants were made aware of something they had forgotten. That could have persuaded them to adopt the issue as something more important. Alternatively, they could have been introduced to something completely new to them and adopted it. We do not know.

We also see from the pie-chart, a small number of participants preferred another idea to their own even where it was not adopted by the group. This item attracted 20% of the vote. This is interesting in that it alerts to influences within the group that may not be recorded in the final vote. This suggests that important and influential issues may never surface from some small-group discussions.

There are other weaknesses in the presentation of the question put to the participants. In trying to isolate all the possible permutations may have created some confusion. There is a risk of a misinterpretation of the choices and the intentions behind them. I could have reduced the choices to (1) Mine (2) Another not chosen (3) Another chosen. This may have been a better format for the purpose.

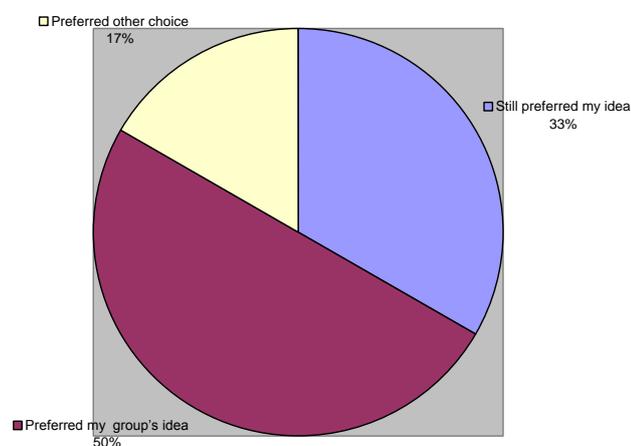
The influence of the whole-process on individual thinking

The vote above was focused upon trying to explore the influence of the small-group dialogue. I was also interested to investigate the influences of the whole process upon

individual thinking. This activity sought to understand whether the change in individual thinking, if any, happened mostly in small group interaction or at the moment when the participants saw the complete list of options generated by the whole-class. The pie-chart below (Figure 20) shows the outcome of this vote.

Figure 20: The influence of the whole-group view on individual thinking

When you saw the list of ideas the class created, how did you generally feel about the ideas your group suggested?



The chart shows that 17% were most influenced by the whole-group list. For these individuals perhaps a wider perspective prompted them to change their decision about the most important issue. The quote from an interviewee (below) suggests that the comparison prompted alignment to the department view:

“...having that discussion and seeing different people’s interpretation of what is happening at the moment and where they wanted to be, made me think about how that effectively should be what I do.” [Tutor 1]

The main influence in changing peoples’ minds appears to have come from the small group discussion. This may well be because it is a view that has been discussed and processed through discussion in the small groups. That would be supported by the depth of discussion in small groups shown in this set of case studies.

Interestingly, about one third of the group were not swayed by the discussion. They remained certain of their initial choice. Alternatively, they may have seen nothing that was more convincing from the issues generated by others. Similarly, half of those responding preferred their group's view over the other groups' choices.

Weaknesses in this research

This is a small number of participants and further research would be needed to see if these findings were replicated elsewhere or whether they are changed in a larger group. As already mentioned, there are question marks around the effectiveness of the tools used.

The choice of options may need some revision in order for all concerned to be more confident about the questions asked. Other tools may need to be used in order to have more confidence in these outcomes. This was an opportunistic attempt with the options generated during a break in the session.

Another important point is that there were only 3 groups and only 12 participants in this session. When making comparisons with other case studies it is important to hold this in mind because if a group proposes more than one option there are issues about the decision-making process and the significance of one issue over another. When each group generates a single issue it may be that those issues are of greater significance and make for qualitative differences in the set of available options and the way they are regarded by the class members.

It is interesting to note that students are more ready to abandon their choices than staff. Students in these case studies often seemed to be comfortable about changing their views. They were more ready to drop their own views and those of their group. This could be attributable to students having a greater level of uncertainty about their own knowledge, about their peers, and about the course. Tutors appear to report fewer surprises and are therefore less likely to change.

Academics in a department are not as numerous as the students. It is easier to get to know the key issues. They may be more familiar with their surroundings. These are all possibilities for further investigation. There may be other factors that might cause this difference between different groups. More research is required into this issue to understand the significance of this issue.

The strength of this approach is that it is a socially situated approach. It appears to illuminate the group-specific view of the issue. In doing so it appears to show the diversity of possible aspects that could all be significant. Each individual is afforded the opportunity to relate to issues of personal significance. In this sense, each issue is equally important. Each aspect appears to contribute towards a view of the situated landscape and in that regard all issues are equally important.

A way of involving participants as Action Learners

Just as I have taken the openness of the start and end point to be self-evident, so it seems that it is reasonable to affirm the feature that participants are co-researchers. This appears to function as a form of whole-group inquiry into the group and its views on a given issue.

In this case study, the Shared Thinking session was a means of investigating the issue of assessment in the department. The tutor organising this session thought this was an important topic for the department, at that time.

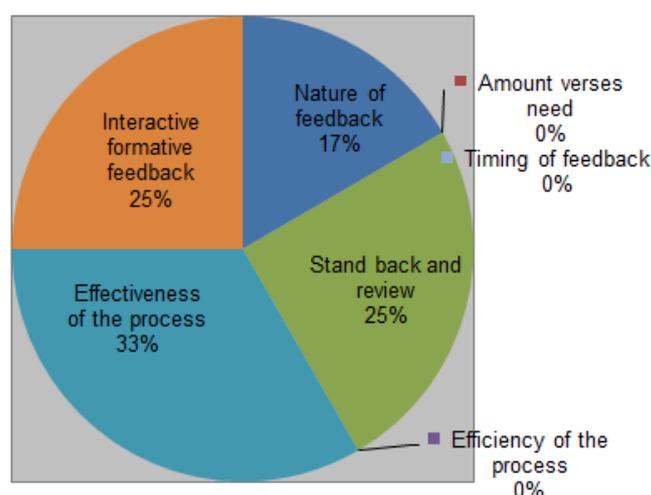
The department was equally interested in the session from a technological point of view. As has been mentioned, the session was a way of investigating an alternative model for using voting technology. The department were already aware of this technology but were unconvinced about the value of it for deep learning.

In December 2010, when this session was delivered, the pie-chart offered a snapshot of a particular Business School in an ‘old’ university. The session afforded the participants an opportunity to explore their situated assessment practices.

From the pie-chart in Figure 21 (below) we can see how the process allows everyone to investigate the views of a department. From this, each person can understand their views on assessment and feedback relative to that of the department at a given moment in time.

Figure 21: Tutors in an academic department reviewing assessment and feedback

What most needs improving in the area of assessment and feedback?



The ability to construct a view of department practices in a 2 hour session allows this to be repeated at different intervals. That would allow a department to assess changes over time on a given issue. Aside from a historical view it would also offer the department a resource for planning.

The process is useful and practical appears to be a way of supporting development at the individual and collective level. It has a different utility value for each stakeholder. As a researcher I was able to obtain data that could be compared with other sessions. A Head of

Department might be interested in understanding current practice and how it impacts upon policy and planning – now and in the future. Tutors are more able to reflect on their own practice.

By making these issues visible, and by documenting the session, participants can participate as co-researchers. It seems that the group, the process, and the situated product offer a rich resource for everyone involved. This includes benefits at the collective level. The quote below shows how the department made a change as a consequence of the session. This is the collective outcome of their whole-group inquiry.

“...about a month ago we looked at our budget and we realised we’d have some money left at the end of the year I immediately thought we can afford one of those sets and before I had time to see the people concerned they’d already put a bid in. So colleagues attending that event and particularly [person name] had put together a bid. I was thinking about it and she’d done it – our head of finance had approved it and sent it to me to ask ‘what do you think?’The bid is about £6,000 so that’s quite significant and it’s all been approved.” [Tutor 2]

The department was also interested in the workshop experience to evaluate the technology. It was interesting to see the way they related their practice to the Shared Thinking session. This is another sense of collective accommodation (Piaget and Inhelder 1969; Piaget 1977) applied to a department.

“we’ve got a.....group and they’re really into engaging with stakeholders, scenario-setting, exploring peoples’ expectations and peoples’ perspectives and I think the way you used it sort of matched their way of thinking and the ways in which they like to work with people. Quite often when they’re working with people it’s face to face with post-it notes and flip-charts. So I think there’s sort of resonance there.” [Tutor 2]

This case study suggests that it is important to think about collective change and social influence. This is in contrast to the more usual tendency to think of development at the individual level.

Review of Features at the Research Level

This case study allowed us to investigate the experience participants have when using Shared Thinking. We switched from the student-generated mode to the traditional mode for using voting technology as a way of collectively evaluating the Shared Thinking experience.

We have also seen the way that participants were joined into the investigative process. There's was an investigation into assessment practices in their department. It was also a joint investigation into different ways in which the technology might be used.

There were individual and collective outcomes from the investigative process. We had some evidence of the way that individuals obtained a view of current practices and that allowed them to align to those practices. There was evidence that the department also changed its practice by making a purchasing decision to buy the technology.

6. Discussion

At the individual level, this case study added to an emerging sense of a phenomenon I have called academic isolation. I am suggesting that this has detrimental impact on the emotional well-being of learners be they staff or students.

If we regard the Shared Thinking approach as one that may support and help to develop a learning community then we can begin to articulate some of the features which may be useful to the development of such a community.

Chief amongst these features are dialogue and a view of the whole-group which is sufficiently representative of the groups view of a given issue. Where these features are

provided, it seems that they may alleviate a certain level of anxiety and be a reliable basis for personal change.

We do not yet know how much of any such benefits are attributable to the opportunity for discussions with peers on group-relevant topics or how much is attributable to the resulting visualisation. We may suggest that the combination of both such features can be a reliable basis for emotional comfort and change. We may also suggest that this appears to be an engaging process compared with some other pedagogical structures and environments. This may mean that participants feel involved as a whole-person.

At the pedagogical level, we added further complexity to the task of facilitating the group. In this session we switched between the student-generated approach and a tutor-led activity. This suggested the possibility of a mixed mode approach within a single session.

This case study also provided a window on the small group discussions. There appeared to be some depth to the dialogue. This was consistent with other applications such as those mentioned in case study two and four. This gave some further support for the idea that participants listened to each other as a feature of this approach.

At the research level, we were able to generate and then explore the collective view of assessment in an academic department. Equally, we were able to join the participants into an investigation of the topic as action learners. They also had an experiential understanding of the technology and the different ways it could be used.

I opened this chapter with a discussion of learning communities as a conceptual approach to professional development in an academic department. The issue for some is that the idea of learning communities can appear vague and lacking structures. There are also questions raised about how or why they are effective in certain conditions.

I am exploring the idea that the Shared Thinking process might offer a resource for developing learning communities in face to face settings. From this, we can see that the group has agency in learning (Kilgore 1999). The representative view, along with the dialogue, appears to influence the thoughts and feelings of members of a group.

From this case study and the previous ones, it appears that this is particularly so with newcomers to a department or university. This dialogue and interaction, as well as the visualisation, may be helpful in making information meaningful. One reason it may be more meaningful is because the outcome is the product of involvement. That involvement may be sufficient to contextualise information within the particular social group in ways less practical compared with the provision of facts.

Others have written about the dangers of communities that may operate a form of tyranny on its members (Ferreday and Hodgson 2010) . It does appear that this approach allows each person to use the group as a learning resource. Some people in this case study are influenced by the thoughts of others. We also see that some people are not persuaded away from their initial view. More research is needed to understand why the influence may be greater on some than on others.

Chapter 10: A Synthesis of the Case Studies in this Thesis

1. Introduction

The initial case study provided the first shape for this design to become a reality. That first session in the initial case study became a template for subsequent applications. I called that template the core Shared Thinking activity. That consisted of a snowball technique combined with the use of the electronic voting systems technology.

That first session, applied to transition for second year students, was an activity design that seemed to work well in practice. That is, it was a process that flowed and that seemed to be productive for the students as well as for the tutors.

Using that first Shared Thinking template, other applications and sessions were organised. In this way, Shared Thinking went from being a core design for a single activity structure to an emerging practice based on variants of the initial approach. Some applications and case studies departed from the original template more radically than others. Even so, it remained possible to detect that template in all of the subsequent interventions.

The hypothesis originated from a prolonged period of reflection on the first session in the first case study. It was fully articulated retrospectively in Chapter One as follows:

If we can extract the diversity of thoughts and feelings in the classroom, derived from a process of reflective dialogue amongst everyone involved, and if by using technology we make them visible so that they can function as a resource, then we may have a new basis for learning, teaching and research.

The first part of the hypothesis implicitly asks whether we can extract the diversity of thoughts and feelings from the classroom. It also says that these thoughts and feelings are

derived from a process of reflective dialogue. In this chapter I will review the evidence in support of this first part.

The pie-charts which have been generated throughout the case studies are constructed from the sharing of individual ideas and experiences. They are generated from the interaction and the dialogue amongst the participants. The pie-charts summarise the discussions.

The items which served as options for the given question are a result of the group discussions. Each option is the outcome of the discussion and each constitutes a decision made by the various small groups.

The voting was a way in which participants were given an opportunity to input their opinion. This began with the formation of their individual position on the issue under consideration. Those initial views were taken into the small group discussions and one of them was chosen by the group.

Participants were able to use the emerging set of options as a resource for learning. Individuals and small groups were able to relate their decisions to those of others (see case study four). The pie-chart generated as a result of voting was also a resource for learning. Each individual was able to relate their thoughts and concerns to the chart in a selective manner (see case study three and four).

The pie-chart was also a resource for learning about one group relative to another or for the same group to look at their level of change over time (as in case study one). They were also a resource for the tutors to learn about their students (case study one and four).

These pie charts displayed the diversity of thought and feelings in the class. They did this in the way that they contained the options chosen in small group discussions. They also did so in the way that individuals voted to show the distribution of thought and feeling for each

of the generated options. These sessions revealed the diversity of thought and feeling about the different issues in contrast to an alternative goal to reach a consensus.

It follows that if we have met the first claim of the hypothesis then it may lead to an exploration of the second claim: that we may have a basis for a new approach to learning, teaching and research.

From this, we need to understand the nature of this new approach. To do this we can set our discussion in the context of the current literature on electronic voting systems. This should help assess the extent of any departure from the status quo. We can also add to our conversation the experience of implementing the Shared Thinking approach in different contexts. These are represented by the different case studies in this thesis. By looking at these different aspects, the current literature and the case studies, we may have a basis for exploring the nature of any contribution made by this thesis.

The Nature of the Evidence Considered in this Discussion

This is qualitative data analysed using an interpretivist approach in a forward-moving spiral that ranges between my practice, my supervision and my initial design. These factors interact. They are considered in a dialogue with each other and with the literature. These aspects are interacting across different contexts.

The notion of conducting a controlled intervention that is to be sustained across each of these case studies is not applicable. I purposely chose situations that were different in order to explore how well the technique might transfer into different settings. The diversity of those settings could not be used to uphold any view of comparable data in controlled interventions.

These case studies were opportunistic. They were the result of contacts with people interested or willing to discuss participation in the research. The case studies could not be considered as a sampling that was in any way neutral. Similarly the participants that came forward for interview may well have been those that were always likely to participate. They may not be a representative sample of the class or of a wider group of students.

In what follows below, I relate the findings for each of the three levels. The discussion below highlights that which was actually understood from the specific analysis.

2. Synthesis of the Individual Level

In this section I will discuss the individual view of Shared Thinking in the following way:

- Agency
- Influence of Peers
- Emotions
- Identity

Agency

In this section, I will make a distinction between individual agency and collective agency in learning. Based on the case studies, I will outline the case for collective agency. Certain theoretical frameworks appear to suggest a particular form of agency. I will summarise them before discussing their connection to the findings in this thesis.

In chapter two I discussed different theoretical views of learning. Constructivism suggested the individual had agency as the only person that could reconcile moments of cognitive dissonance. There is also a discourse in education around the idea of student responsibility for learning (Jansen and van der Veen 1996). We might call this cognitive responsibility (Viilo, Seitamaa-Hakkarainen et al. 2011).

Social Constructivism suggested that agency may sometimes be located elsewhere. Specifically, this could mean tutors and more knowledgeable others. Those others have agency for their ability to transport the individual further than they could alone.

Social identity theory would suggest agency is context-sensitive. Sometimes it could be individual and other times it could be with the group. Kilgore also suggests that it is reasonable to talk about collective agency. These different theoretical lenses make the idea of allocating students responsibility for learning problematic. Theoretically, there is a variety of different ways agency is connected to learning. I will discuss these in relation to the findings from the different case studies.

A shift in students' perception of responsibility, from seeing it as entirely theirs to seeing it as something shared, is positively related to changes in attitude, emotional and behavioural responses. Such a shift in perception is also positively associated with improvements in grades (Sierra 2010).

Elsewhere is the idea of adopting a learning in communities approach emphasises that much is dependent upon the model of working together and particularly the values that underpin it (McConnell 2000; McConnell 2006). This is a more democratic approach that provides a space for individuals to bring their practice into the course as a basis for social investigation.

How the participants are organized is also a factor in the development of individual participation and knowledge-generation (Hansson 2010). This is the responsibility of the tutor. There is also a way of interpreting student-led learning as something collectively-led (Scardamalia 2002; Viilo, Seitamaa-Hakkarainen et al. 2011). This suggests a sense of collective agency. The notion of student autonomy may also be a cultural and even a gender issue (Sakai, Takagi et al. 2010).

Individual Agency

Case study 1 (chapter 5) saw the creation of the initial structure for the Shared Thinking design. That was explicitly created to respond to the tutor's concern that students failed to see the value in working with their peers to support their learning. In that initial case study the tutors were also keen on the idea of students taking more responsibility for their learning.

The tutors made explicit mention that the students had more time for informal gatherings. The course had less contact time than the average physiotherapy courses elsewhere. The tutors wanted to see students organising study groups to take responsibility for their learning and to reflect on their course.

The course tutors had attempted to individualise the provision by reducing contact hours and adding open learning materials to support contact time. Despite this extra available time the students were using it for things other than studying. Students often disregarded the open learning materials preferring to wait for the lecture.

This approach to individualised learning had met with limited success. Students were a mix of old and young; some were married and some single; some had work experience whilst others had arrived from school. Some were changing careers while others had yet to work at all. The desire to arrange meetings was minimal and the practicality of arranging informal meetings was limited.

That case study organised the students to reflect together and to visualise their collective view. It used the diversity within the class group as a learning resource. Although learning was an individual responsibility to participate and process the information the individualisation came from the creation of a meta-level view that allowed each individual to relate their thinking to that of their peers.

By the final case study, the data showed an emerging theme of academic isolation. This was a way of describing several instances that showed how few conversations were available to individuals. Some of the students knew the opinions of close friends or small groups but were unsure how representative they were of the class as a whole.

One consequence of this academic isolation was a lack of action. There appeared to be some actions that occurred as a result of participation in the Shared Thinking activity. We know for example that the new tutor in case study five only changed his practice once he had discussed the issue with his colleagues and seen the resulting pie-chart in that session. We also know that he had conversations with individuals in his department and that he had a policy document supplied to him.

In his case, this might suggest that the available information about the social context was insufficient to provide confidence enough to change personal practice. We know that he did change his practice after this session.

Another consequence of this isolation was that people were prone to becoming anxious partly as a consequence of being unaware of how their work compared to that of others. Second year students in the first and third case studies reported having anxieties that were resolved by knowing they were not alone in having particular concerns.

We also saw a student in the fourth case study who was relieved to see her practice was 'normal' in the context of her peer-group. In this way, we can say that academic isolation may have an adverse impact on student well-being.

Collective Agency

In contrast to academic isolation, there was a sense of collective agency. We noticed in several case studies that individuals were prompted to reflect on their own view. This was as a consequence of participation and the ability to relate their views to those of the group.

In addition, we saw that as a consequence of having a reflective dialogue and being able to visualise their conversation, individuals were caused to take action. It was when the view co-authored by the group was sufficiently representative of the dialogue and interaction that individuals changed.

In this way, it is possible to think of the group as having agency in learning. We can see how the group's views were an influence on the ways that individuals thought and felt about their learning.

It is not realistic to imagine that the students can organize this without support from the institution. On this basis I argue that responsibility for organizing learning falls to the institution. Responsibility for contributing to the learning of others – individually and collectively is shared amongst the peer-group.

Influence of Peers

There was some evidence that our perception of our peer-group may be a factor in our development. We were alerted to this in the first case study. That session witnessed one student who avoided using a particular support service based on her perception of others in consequently she avoided it. That was without any specific knowledge about the peer-group and their actual view or use of that service.

The other case studies also showed how this process has been organised to generate a visualisation of the peer-group view on a particular matter. Having done that, we also noted that some participants changed their practice.

We saw, for example, in case study three the way that one participant became aware of a different way of organising his timetable and made changes accordingly. That particular example could just be the result of getting useful information. However, we also saw in the second case study the way that seeing the whole-group view caused some anger about the way that others might perceive support tutors involved in a national project.

Elsewhere, in the fourth case study we saw the way that one student was prompted to re-locate her view of her teaching practice as normal in the context of the group. That reduced her anxiety about whether she had been over-stepping the mark. We also saw in the third case study how one student had seen the whole-group view and realised they had less to worry about than they might have thought and possibly less to worry about than others.

Finally, we saw in the last case study the way one tutor was caused to change his practice as a consequence of seeing the way that his colleagues were working and the way they thought about and practiced assessment.

These are all different ways in which individuals were influenced by their peers. Some were influenced by perceptions that were probably flawed, others were influenced emotionally and then others were influenced to change the way they addressed their studies and work. From this, it seems reasonable to suggest that peers are influential in support and development both for staff and for students. In this respect, learning can be seen as social as well as psychological.

Emotional Factors

Any approach claiming to be a form of whole-group inquiry must take account of the disposition of the participants. I have already mentioned the Making Learning Visible project at Harvard in chapter 2. Members of that project team said that critical thinking is not a skill but rather a set of thinking dispositions (Perkins, Jay et al. 1993).

The key to critical thinking, in their opinion, was to organize a disposition for metacognition that supports learners to reflect and evaluate issues (Perkins, Jay et al. 1993). Stroup also highlights the importance of disposition and the way that working as a whole-group in the networked classroom organises thinking towards investigation as a social endeavour (Stroup, Ares et al. 2004; Stroup, Ares et al. 2005; Stroup, Ares et al. 2007).

There is a structural element to this in that the way we organise interaction may partly determine the way attention is focused. In this respect, we may consider that the Shared Thinking process is one that organises attention upon a particular issue that is relevant and important to the participants. In the case of new students it may be to do with the issues that concern them on arrival at the university. In the case of support tutors it may be to do with their practice in providing support in their different institutions as part of a national programme.

There may also be a psychological and emotional response to that because that practice, in the case of the support tutors in the second case study, is part of who they are as people. It is also social because it is part of who they are as a group. For either reason, that may induce the kind of response we saw in the second case study where participants were moved to such a degree that they were prompted to question its morality. That was despite some having used the technology in the traditional way of having the tutor set the questions and feeling no such concern.

In this respect Shared Thinking seems to organise participants emotionally into a collective disposition. There were several mentions of participants feeling that they were being heard by others involved and also by tutors. In case study three, for example, one interviewee described the process as a feeling that the students were being listened to by the tutors.

That particular respondent felt that the session seemed as though the tutors were waiting to hear about what the students had discovered. There is a sense that they felt people cared about what was being said by these new arrivals and that they were not merely issuing a standard message.

In the fourth case study, another interview mentioned that they had a real sense of ownership. She noted that there was no sense of there being a 'right' answer that the students were set to discover. Rather the feeling was that they were given a topic and invited to explore it as they saw fit.

The most common theme emerging from the interviews was that of feeling engaged. In the second case study, one respondent noted that this was definitely an authentic *workshop* meaning that they were psychologically engaged and involved in work that had meaning to them individually and collectively. That same case study also generated the discussion about the strength of feeling generated by seeing their practice summarised on the screen as the product of their reflective conversations. All of this suggests engagement.

The third case study had one interviewee acknowledging the way that the session had made them feel a sense of togetherness including, by extension with the tutors and the institution. The final case study had one respondent who noted that the experience had kept them off their mobile phone. As trivial as this may seem it may also be an indicator that the process was one in which other possible distractions were over-ridden such was their sense of engagement.

More than any other issue, the theme of engagement was repeated across almost all interviews and all case studies. This appears to suggest that they were addressing an issue that was important to them at an individual level as well as a collective level. It was something they all had in common. It suggests that it was about them and who they were at those different levels. As such we can see this as an issue of social identity.

The feelings noted above were also in contrast to the idea of a notionally similar activity in which a tutor might set the options. Although this was not specifically explored as an intervention it was an issue that participants would have experienced in different forms. It was also an issue that was put to most of those interviewed. Of those that were asked that question about the difference between student-generated issues and tutor-generated issues there was common agreement that they were qualitatively distinct. Each of those asked that question in the interview reported that they would be less mentally invested in responding to tutor set options and would be less engaged.

We do not know whether that might be true of all issues or more of a factor on matters of social welfare or less factual information. It did seem true for trainee teachers on placements reviewing their experiences together. More research is needed to investigate this more thoroughly. Participants did however seem to relate their personal view to those articulated on the screen and generated by the dialogue and interaction. This seems to be emotional because their views on any matter are personal, and social.

The way that the sessions were framed by the opening question also appears to influence the emotional response of participants. In case study four we organised the sessions around a positive view of the student experience. In those preceding, we organised them around concerns. This seemed to produce a different emotional outcome. For the support tutors in the second case study, it generated some anger about how they might be viewed by others.

In the fourth case study, it generated a positive feeling about a shared sense of achievement at the end of their course. This does suggest the possibility of managing the orientation that

participants have towards the session. More research is needed to understand some of the factors for different groups and situations.

There was also some suggestion that Shared Thinking may have applications for supporting mental well-being. Specifically, this refers to ways in which this process might help to relieve stress and anxiety by fostering a sense of belonging.

The first case study provided one indication of this view with the comment that participants had enjoyed a 'feel-good experience.' Other case studies showed a common theme in which interviewees reported feeling relief and comfort from seeing that they were not alone in having particular concerns.

The fourth case study showed how students might gain some confidence about their level of performance on placements by being able to relate their experience to that of others. Those students seemed to feel more confident as they prepared to leave the university and enter the teaching profession.

Seeing the thoughts of others helped to reduce a sense of isolation that often persisted into the second year (and almost certainly beyond). In case study three one interviewee reported that the session had made her feel less of an outsider. This suggests that the process may induce a sense of belonging.

These factors, taken together, suggest that emotional aspects are part of this process. It suggests that the emotional response may be attributable as much to the peer-group and social factors as they are to do with any psychological and individual matters. It also suggests that some of these affective and relational issues might be managed in the design of this process.

Identification

I have discussed several aspects that relate to the identity of a particular group in the section above on emotional factors. In that section, it was noted that these issues were common to both individuals and the group as a whole. To that extent, the discussion and resulting display can be seen as very much about them and who they are on a group-relevant issue.

There was some suggestion that participants related their thoughts to those of the group and explored them to see which provided the best personal fit. We also saw some evidence that participants changed their practice or took action as a consequence of this process.

The tutor in case study five, for example, changed his practice to align with the department once he saw the group view. Students in case study four realised their practice was 'normal' in the context of the peer-group once they saw and heard the responses of others.

The suggestion is that seeing themselves as a member of the group prompted individual participants to relate and align their thinking to that of the group. They seem to identify with the group and the situated values, beliefs and practices of that group.

One interviewee, in the second case study, commented that the process would be useful for first year students because it would show them 'who they are' and 'where they are' at that moment. This seems to be indicative of a sense of group identity.

There was some evidence that suggested the session promoted a feeling of togetherness. In the third case study, for example, one interviewee felt a greater sense of belonging to the group. This is also indicative of identification and identity development as a possible feature of this process.

Summary of Individual Level

From the data, I am suggesting that we might consider development as a social issue as much as it is a psychological issue. I am suggesting that groups have agency in learning and that we can manage that when we organise dialogue and interaction this way.

I am suggesting that because the sessions were about issues that were relevant and important to the participants these sessions were emotional as well as being to do with ideas and information.

I am suggesting that peers influence each other and that the perceptions individuals have of those peers is also influential. That influence seems to be a factor in the well-being of a given individual and also in the way they participate in the discipline.

Finally, I am suggesting that identity seems to be a factor in this process. It seems to be that this is partly to do with the individual sense of who they are but also partly to do with the identity of the group. This sense of who the group is relates to their co-authored view of a group-relevant topic.

3. Synthesis of the Pedagogical Level

I began this thesis with the idea of exploring different ways of using classroom technology for discussion. The initial focus was upon group-learning with these technologies as a gap in the literature.

As the work has progressed across the five case studies the focus has moved from being an idea of learning design as an instrumentalist issue to one paying increasing regard to the

psychosocial impact of the interaction and the particularly the role of social identity. The shift is summarised in Table 4 below.

Table 3: Instrumentalist versus Social Identity Approach to Learning Design

Instrumentalist Approach	Social Identity Approach
Greater flexibility for independence	Greater togetherness and socialisation
Design built on improved access to content	Access to group perspective
Technology built around individuals	Technology built around groups
Individual approach to reflective practice	Group approach to reflective practice
Production of autobiography	Co-production of collective biography
Work as the target context	Group as the target context
Identity as individual	Identity as social and individual

This thesis charts the evolving view of group learning away from the design of structures and processes towards the development, management and use of social identity. Both of these – the practical and the psychosocial – are vital to the ability to develop this work in different contexts. Shared Thinking began with logistical concerns and developed towards an interest in social influence.

One reason I detail these distinctions is to highlight the way that education has sometimes been designed around the notion of an individual learner. Technology has then been regarded as a tool for addressing the improvement of access to the course and as a means of increasing flexibility.

In a similar vein, reflective practice has been seen as an issue for the individual. This has led to individual tools such as e-portfolios being developed to support flexible access and

reflective writing. Learning is seen as the production of a narrative to story the self across different contexts.

We have also increasingly regarded learning as preparation for work and we have consequently set aside the classroom as a safe space in which reflection might give rise to meaning beyond the workplace. There is a movement, away from the notion that education may be a contribution towards the public good, to the idea of education as a service to individuals. (Jansen and van der Veen 1996; Hansson 2010; Schad, Roessler et al. 2011).

These features could be said to define an instrumentalist view of learning design that seeks to individualise learning in a structural and procedural manner. I am not suggesting they are not important. Improved access and time and space to reflect alone are often necessary. I am really seeking to highlight a view of individualised learning based on practicalities of competition and scale.

Relational Pedagogy

Through each of the case studies, we found considerable evidence of the different ways in which participants related their thinking to that of the group. This relational act occurred within the small groups, as the small-groups reported their decisions and as individuals considered the choice of options before voting.

Case study three provided evidence of how individuals were made aware of issues they had either forgotten or which they had not realised an issue was situationally significant. There was evidence in that case study and in the last case study of participants taking action or changing their thinking as a consequence of this awareness. Case study three also gave us some evidence of people feeling a greater affinity with the group as a consequence of their involvement in this activity. One interviewee reported a sense of empathy towards others. Part of this was the recognition of common ground amongst the group-members.

Case study five, showed the level of scrutiny given to the issues that were raised by the participants. This was evident in the way that some of the interviewees reported listening to the feedback from each group. It was also true that some participants interviewed considered each option in turn. Having done that some reported re-visiting the question that framed the session before deciding on the option for which they would vote.

It seems from some of the evidence that participants asked themselves which of the options offered the best fit with their own thinking. In this way they appear to have been involved in a matching activity. There was considerable evidence to suggest this was distinct from the way that participants might have considered options provided and already created by a tutor.

The options generated by the whole-group, and the subsequent display of votes, share the thoughts of the class on a group-relevant topic. We might reasonably suggest that the resulting display constitutes the externalised group-situated schema – the mental structure – for a given topic. As individuals relate their own thinking to that of the group, it seems that they are engaged in a comparison of schemas for a given topic. That topic is relevant to both the individual and the group.

From this perspective, individuals are engaged in a particular form of metacognition. They are thinking about thinking. On the one hand, they are thinking about the thoughts of the group. On the other hand, they are using a group-specific schema as the basis to reflect on their individual thinking.

This appears to be a more expansive form of meta-cognition than might be achieved when reflecting alone. A solo approach to reflection might be focussed upon an investigation of individual thought processes. This might have little reference to alternative perceptions. The Shared Thinking process prompts reflection upon one's own ways of thinking via the comparative act. This is conducted with a socially relevant group on a group-relevant topic increasing the likelihood of greater attention via identification.

The Shared Thinking approach therefore appears to offer a more developed process of meta-cognition. It is achieved not by looking inward on itself but by looking outward and making comparisons of distinct ways of thinking. This is facilitated by the process offering a comparison of conceptual structures (schemas) rather than on any point of apparent agreement. The comparison is therefore much richer for the goal of generating a view of the situational diversity of thought rather than any attempt to strive for consensus.

The psychosocial approach also seeks to individualise the learning experience. However the way this is done is to focus upon the group-level. Specifically, the goal is to focus on a learning design based on developing a shared sense of identity in the classroom.

In this psychosocial approach, I argue that learning is seemingly more individualised because of the way that Shared Thinking seems to address emotional as well as cognitive needs. The case studies discussed in this thesis have all shown evidence of participants having a sense of togetherness and belonging. This has contributed towards a process of socialisation particularly in cases of induction, for example.

The issue of access becomes focused upon an ability for each participant to obtain multiple and group-situated perspectives. Each person has access to the whole-group perspective as a learning resource. This illuminates the issue under collective review and provides a visual of the socially-situated schema for each individual to compare their views.

In the social identity view we move from regard for technology to support individuals to participate in learning from anywhere using different devices to a view of technology to support the development of a group-specific perspective.

We also move from a focus on the particular workplace experience of a given individual to a meta-level view of the aggregated experiences of all those on placements (as in case study four). In this way, the group becomes the context and the social identity of the group

is the basis for development. This is a process in which the group has collective agency in learning.

Finally, we shift from a view of reflective practice as a task for the individual to one in which reflective practice is a process of whole-group inquiry. Reflective practice has been boundaried by the individual experience with the consequent modelling of support aligned to this solo view. Witness the rise of papers and conferences around the idea of e-portfolios (Ritzhaupt, Ndoye et al. 2010; Schaffhauser 2010; Brown 2011; Chang, Tseng et al. 2011).

The Joint Information Systems Committee (JISC), in the UK, recently undertook a survey of the effective use of e-portfolios (Joyes, Gray et al. 2010). The focus was not one that questioned the rationale for their introduction. The focus of that report was upon how to implement them more efficiently. The idea of effectiveness, in that report, appears to function within a paradigm of greater individualization of institutional provision.

Part of the pedagogical rationale for developing portfolios is to support a sense-making process from the development of a learning journal. We can understand these journals as autobiographical approaches to development (Karpiak 2005; Henderson, Oakleaf et al. 2008; Delamont 2009; Karpiak 2010; Heo 2011; Wilson 2011).

The Shared Thinking approach sees a further shift from the production of an autobiography to a focus upon the joint production of a collective biography (Davies and Gannon 2006; Weiner 2008). It is also a process that reflects through situated dialogue. Authoring is a shared and democratic activity that produces a polyphonic text (Roen 1990)

The collective approach to reflective practice sees individuals able to relate their thoughts to those of the group on a group relevant issue. This has the potential to provide greater reflective capacity for individual members and allows them to focus upon the group specific meaning of those issues.

The Tutor's Role in Social Identity Approach

The Shared Thinking design is based upon the co-construction and visualisation of the situated social norms of a given group. By communicating this student-generated view and making it visible to everyone the participants provide a shape and structure – an agenda – for the tutor. This means that the tutor has an opportunity to offer a response which is contingent with the group's thinking.

The balance between the tutor's responsibility and any sense that the group might be collectively responsible is an issue that needs careful consideration (Scardamalia 2002; Schad, Roessler et al. 2011; Viilo, Seitamaa-Hakkarainen et al. 2011). However the idea of the tutor being a leader is called into question in this thesis.

The tutor role is nearer to orchestration (Hansson 2010); managing the focus of attention; and acting as a co-investigator. These are in addition to being a 'cognitive expert' (McConnell 2000; McConnell 2006). To this collection of role-descriptions, I also suggest that the tutor's role is to 'curate' the shared sense of identity for the whole-group.

We noted the way that having a different approach to the way the framing question was framed could lead to different emotional responses and a qualitatively different outcome. We can see this as we compare the responses in case study two with that in case study four, for example.

In addition, we can also see how it is possible to group or 'cluster' different group products. This can be done within a session (case study 1) or between different sessions (case study 5). It therefore becomes possible to work with different products to chart change in different ways. This means that the way we frame the sense of identity is a key task for the tutor. In that sense it becomes possible to describe the tutor's role as curatorial – taking care of the way the group's sense of self is framed and developed.

Re-Thinking Group-Learning

In chapter 3, I provided a definition of characteristics that make up a group, based on the work of Jacques and pointing to some of the key variables in the way we might consider groups (Jaques 1984). I repeat the list below showing the 8 defining characteristics of a group (Jaques 1984):

- Collective perception: members are collectively conscious of their existence as a group
- Needs: members join a group because they believe it will satisfy some needs or give them some rewards.
- Shared aims: members hold common aims or ideals to which to some extent bind them together. The achievement of aims is presumably one of the rewards.
- Interdependence: members are interdependent in as much as they are affected by and respond to any event that affects any of the group's members.
- Social organisation: a group can be seen as a social unit with norms, roles, statuses, power and emotional relationships
- Interaction: members influence and respond to each other in the process of communicating, whether they are face-to-face or otherwise deployed. The sense of group exists even when the members are not collected in the same place.
- Cohesiveness: members want to remain in the group, to contribute to its wellbeing and aims, and to join in its activities.
- Membership: two or more people interacting for longer than a few minutes constitute a group.

I commented, in Chapter three, that this was a description of the characteristics of a group. I noted that this was not a pedagogy and nor was this list a description of learning. I also said that this could not be regarded either as a process or product of learning. At this end of the thesis, I have changed my mind. I see the above list as a description of the psychosocial pedagogy of Shared Thinking and the social identity approach to learning.

Shared aims, collective perception, interdependence, membership etc. are all core elements of social identity used in the Shared Thinking process. Interaction leading to cohesion and a shared sense of membership along with awareness of the group-norms as a basis for development are all defining characteristics of Shared Thinking.

Table 4 below provides an overview of the main features that came out of the different case studies. These are seen as a way of providing detail on the original list of features presented for pedagogy. Those features were all upheld as valid but these main points are seen as a way of elaborating upon that list in a case-specific way.

Table 4: Overview of Pedagogical Features of Different Case Studies

Case Study	Main Pedagogical Features	
Case study 1	<ul style="list-style-type: none"> • A process for reflecting together as a whole-class • The Re-admittance of Feelings to a formal class • The Management of Interaction • Grouping artefacts • A new approach to induction and transition for a course 	<ul style="list-style-type: none"> • Multiple Sessions • Removal of a disruptive element in previous group learning practices • Emotional and Cognitive outcomes
Case Study 2	<ul style="list-style-type: none"> • The use of a different duration • A single sequence of Shared Thinking • The pooling of distributed experience 	<ul style="list-style-type: none"> • Emotional and Ethical issues • Engagement
Case Study 3	<ul style="list-style-type: none"> • A scaled up version of Shared Thinking • Different visualization technology • A comparative view of different session structures • A collective disposition of inquiry 	<ul style="list-style-type: none"> • A conversational feel • Multiple voting • Different display format • A new approach to induction and transition for a faculty
Case Study 4	<ul style="list-style-type: none"> • Distributed student experience • Comparative view of different sub-groups on the same course • A process for reflecting together on placements • Development of professional discourse 	<ul style="list-style-type: none"> • Ownership • Multiple sequences of Shared Thinking • The elaboration of collective experience • Evaluation for us
Case Study 5	<ul style="list-style-type: none"> • A way of pulling together isolated assessment practices • A way of evaluating Shared Thinking collectively 	<ul style="list-style-type: none"> • Alignment to department practices • Depth of small-group discussion

Summary of Pedagogical Level

Individualisation expressed as greater flexibility in learning design is problematic. Greater fragmentation of provision offers little coherence in the course-experience of the learner. It also raises questions around the development of personal, social and subject-identity as learners move across both modules and subject-areas (Jansen and van der Veen 1996). This difficulty is at the heart of this thesis. I argue for the restoration of education as a space in which to think and connect with feelings in and about different groups.

I also support the development of additional values, as well as economic goals. These include fostering the development of a greater sense of community and a culture of ideas and dialogue. For this to happen, we need to focus more on good pedagogical design rather than blindly following every new technology (Roschelle, Knudsen et al. 2010).

I argue that the Shared Thinking approach, as an investigation of the thoughts of the situated group, offers a psychosocial practice that supports contextual relativism and commitment (Perry and et al. 1968; Perry 1970). Such a practice may help to overcome any possible tendencies towards absolutism whilst also addressing issues to do with socialization.

Contemporary life has been described as living in a condition uncertainty and anxiety (Jansen and van der Veen 1996). This thesis suggests that this has much to do with how we organise learning. The age of the internet, the movement of jobs etc. are certainly factors that may impact upon our individual and social development. Equally, these may be regarded as symptomatic of an instrumentalist view of education and the resulting approach to individualization and devolved responsibility in education (Jansen and van der Veen 1996).

These case studies offer some idea of an alternative approach built around a psychosocial approach to individualisation. There is a much wider opportunity to develop a new

psychosocial pedagogy further elsewhere. This is pedagogy based upon the development of social identity, social relationships and relational learning. Taken together, Shared Thinking may provide a psychosocial pedagogy for individual and collective development. This is an approach to learning design that inscribes identity to each group through the co-construction of situated social norms. Participants are involved in a process of ad-hoc (for this) ‘*group definition.*’

The psychosocial pedagogy articulated in this thesis provides an alternative idea of personalisation accessed through collaboration and cooperation that develops a shared situated identity. This is a pedagogy that says that although we are in some senses individually responsible for our own learning we are equally also responsible for the learning of others (McConnell 2000; McConnell 2006).

Developing the ideas originally put forward by Vygotsky (Vygotsky 1978), Shared Thinking is also a pedagogy in which the individual learns more than they could alone. It is not possible to achieve the goal of co-constructing a shared understanding of the social norms without the contribution of others. In this sense, *each* individual learns more than they can do alone.

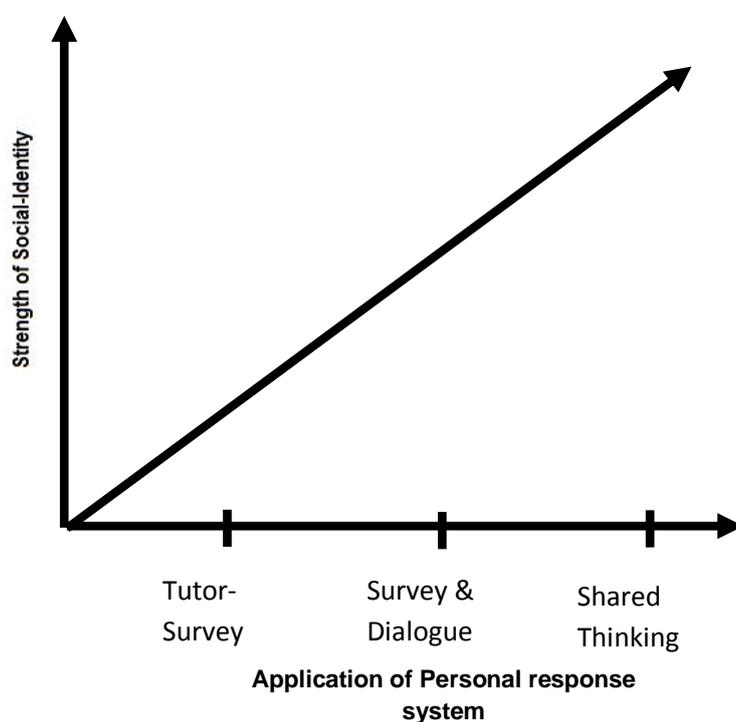
Learning is a responsibility shared not only amongst the students but with staff and with the course design. This needs staff (not necessarily always the tutor’s role) to organise the meeting but it is the peer-group that are responsible for the co-construction of the shared and group-situated understanding. Then it becomes the responsibility of the individual to process that which is personally relevant. The unifying vehicle is a process of defining the group!

“Rather than constraining the learning experience to be somewhat narrowly individualistic, these technologies support socially situated interaction and investigation” (Stroup, Ares et al. 2004).

Finally, there is a popular view of the tutor’s role, when using technology, as one that involves moderating (Salmon, Nie et al. 2010) and orchestration (Stroup, Ares et al. 2005)

of interaction. We also see this role as an act of identity-management. This has been described elsewhere in cases where leaders are seen as ‘entrepreneurs of identity’ (Haslam 2004; Haslam, Reicher et al. 2011). However, we would argue that a more appropriate view might be that educators can be conceptualised as ‘*curators of social-identity.*’ From this we have developed a model (see Figure 22) to relate the use of classroom technologies to the probable consequent strength of social-identity.

Figure 22: Uses of Classroom Technologies and Strength of Social-Identity



We can argue that a general use of voting technologies (personal response system) invokes a sense of group-identity even when responding to tutor-generated questions. The display of votes communicates back to the participants as well as outwardly to the tutors (Draper and Brown 2004; Draper 2009). The results articulate ‘our’ view of the tutor’s questions. We can regard this as an infusion of identity (Hegedus and Kaput 2002; Hegedus and Kaput 2003; Hegedus, Kaput et al. 2007; Roschelle, Knudsen et al. 2010).

This sense of identification is likely to increase through the introduction of peer-group discussion when used to support responses to tutor-made questions. This is because socialisation is one of the factors which increase in-group identification (Livingstone,

Haslam et al. 2011). This may be an explanation of the significant benefits reported for Peer Instruction and other such approaches which combine personal response system and peer-group dialogue (Mestre, Gerace et al. 1996; Crouch and Mazur 2001; Beatty, Gerace et al. 2006).

At the furthest point along the identification continuum (above) I have presented some evidence to believe that the Shared Thinking process goes furthest in articulating and then using the social-identity of the situated group. I am suggesting that the group-specific norms are the 'content' for the Shared Thinking session. These visible situated social norms provide a link to group-members and a connection to wider knowledge (the tutors-view, the literature, the community etc.).

4. Synthesis of the Research Level

I have suggested that we might usefully move away from an idea of learning design built upon an instrumentalist concept individualisation in learning. This changes our view of ideas of individual responsibility and individualized provision. I argued that this instrumentalist view of learning design is a product of economic and political forces. It is also a product of an institutionalised view of learning design from 19th century models of work.

Following on from this instrumentalist view of education, I would suggest that there has been a focus on individual narrative-development. We see evidence of this in the idea of learner's reflecting alone and using self-storying tools such as learning journals and e-portfolios. This gives us the sense of individual's generating a biography of their learning.

Whilst these can be important and supportive ways of learning they may also miss an understanding of the social context. I argue that the social context is important because it is a major source of influence in the way we think of ourselves and the way we learn in the shared space which is the classroom and the course.

This leads to a shift in emphasis from the construction of individual narratives to the co-construction of collective biographies (Vandermeer 1980; Bucher and Manning 1998; Davies and Gannon 2006; de Carteret 2008; Sakellariadis, Chromy et al. 2008; Weiner 2008; Bansel, Davies et al. 2009; Claiborne, Cornforth et al. 2009; Pacini-Ketchabaw, Kummen et al. 2010). Through their participation in the production of such narratives the idea is that individuals have an opportunity to understand their experience and views in relation to those of others. Each story verifies and expands upon another and each one is related to those others.

Collective biography is an emerging field. The citations above reference work already done in feminist memory work. This is held to be a post-structuralist approach to development (Davies and Gannon 2006). Participants work together on a given issue to bring together experiences and memories of how life was lived. This kind of activity gives individuals a different way of reflecting together whilst it admits and documents thoughts and emotions. These lives may not always be captured using other methods.

Within a psychosocial notion of learning design, I have proposed, developed and implemented pedagogy based around the co-production of collective biographies. These pie-charts are the product of collaborative inquiry that capture and display the group-specific views on a group-relevant topic. I argue that this approach to individualism affords different opportunities for research that also fit with the ideals of action research.

Students as Action Learners

I have made the suggestion that we might see students as action learners. It is important to understand that this may not be consciously understood as such by those involved. In these case studies, there was no explicit communication to those involved that they should understand their involvement in that way. The participants would be unlikely with this single intervention to understand their situation this way.

I am using this heading in an attempt to point out the potential to construe and develop participants as action learners in a systematic manner should this process be used as a routine part of a course. In the paragraphs that follow I seek to explain how such a view may be justifiable in the future.

There are at least two senses in which Shared Thinking might appear to support students as action learners. Individually, the process joins each person into the inquiry process. The outcome of this involvement is support for the ability for each individual to understand their experience and thoughts in relation to those of their peers. This provides each person with multiple perspectives which are importantly organised into a coherent form.

Another way in which students can be understood as action learners is at the collective level. The group becomes a learning entity. As such the resulting pie-chart functions as a record of whole-group investigation into a group-relevant topic. For this reason it seems legitimate to regard these electronic documents as collective biographies.

Moreover, the ability to group these electronic products allows the students to understand their collective (and individual) experience within different frames. It becomes possible for the group, and its members, to understand, explore and discuss change at the collective level.

The Community as Action Learners

In chapter two, the Making Learning Visible project was discussed. In that project, the role of documentation was an important feature. By capturing and displaying the learning that had happened in the classroom, it became possible to communicate the collective view back to the class of originators. It was equally possible to use the process to communicate outwards to others.

The Shared Thinking process, along with the electronic group-products, supports a similar process. We re-used these collective biographies in other sessions (case studies 1, 2, 3 and 5). It was also possible to share these group-products online. This was done with case study two where the group-product was shared on a discussion list of all PDP practitioners. In doing this, the anonymous group-product was sent to those directly and indirectly involved.

Equally, the reporting of these products and the findings in journal articles and other publications shows how these group-situated products can extend participation in the investigation.

Academics as Action learners

In addition to participants and community as co-investigators we can of course see researchers and academics as part of the investigative context.

Collective biographies illuminate an issue at a moment in time. They represent and communicate 'life as lived' by those involved (Rosenwald and Ochberg 1992). In this sense, academics have a view of collective and group-situated student experience. These stories are typically generated from 100% participation in the voting and they contribute towards the construction of a collective memory (Davies and Gannon 2006; Weiner 2008; Bansel, Davies et al. 2009; Claiborne, Cornforth et al. 2009).

This area of research is presented here as an alternative to an individualistic interpretation of experience, pedagogy and history. There is no reason why biography needs to be represented in text. There may also be benefits in a minimalistic view as one person noted in case study four when they said that they were able to explain each option and the results. Perhaps the pie-chart leaves a space for the 'reader' and their response to the jointly constructed text (Rosenblatt 1977).

The collective view is one that retains individual authoring through various personal inputs. At the same time the Shared Thinking process avoids privileging one particular participant over another. This is a more democratic and empowering process of research that communicates the diversity of thought to each participant and communicates outwards to the social world as a response and a 'witness' to lived experience. I argue that the Shared Thinking process asks some fundamental questions in the area of methodology and analysis.

For instance, there are certain power relationships that must inevitably come into play when one individual records experience in their writing. People documented in those individually written texts are being 'authored' by others. The individual writer assumes authority even when representing the work of a group.

We should therefore question who should write the biography of shared and social experience. If each person participates which memory/text appears first, second or last? Who does the editing and whose name is first author/editor? These are all common issues and tensions in research and in the recording of social life in general. Shared Thinking restores some sense of democracy in configuring research into a communally participative process.

General Points about Research

In a more practical and possibly mundane manner this process of Shared Thinking allows us to investigate the experience of students at the collective level. This is a useful and unique approach to the study of student experience – an issue recognised as vital (Yorke and Longden 2008) but for which survey methods are impacted by the time required and the level of response.

In case study one, it was possible to investigate the collective experience of being a student on the course across two years of a course. There was no reason that could not be done for

each year of their course. It becomes easy to see the potential to map and investigate the journey of a cohort across the whole course. It is equally possible to compare one cohort with another.

Similarly in that case study, we were able to assess the impact of a dialogue with mentors. We created a before and after view of a set of issues. They were put together on a slide to share the level of change that had happened.

In case study two, the participants brought together issues from their diverse practices and enabled a new level of conversation in which each practice was presented in relation to another. The collective view of those practices provided a commentary on those being served and upon the community of providers.

In case study three, a deeper view of the issues was brought into view. The participants co-constructed a set of issues and then provided a collective view of each item raised on a Likert-Scale. This raises new questions about other possible formats and other ways of communicating and presenting similar information. This case study also allowed many more participants to express their views. The collective expression may therefore have greater value as a richer and broader representation.

In case study four, it was possible to look at two dimensions of collective experience. Firstly, it was possible to investigate course experience from the perspective of one stream alongside another (early and later years student-teachers) both on the same course in the same year.

Secondly, it becomes possible to explore placement experience by not only aggregating the issues raised but also by elaborating the placement and its impact in a detailed way. This case study involved each stream of students reviewing their placements from three different angles.

Each of these provides useful insights into the collective experience but when placed together these pie-charts offer a fine-grained picture of a set of final year students who are under-taking their last placement before entering a profession. It would be difficult to imagine how else such a detailed and co-constructed view could be constructed in a two hour slot.

In case study five, it was possible to understand the lived experience of assessment in an academic department. It is easy to imagine this as a group-situated approach to professional development on a variety of other issues such as course evaluation, policy development etc.

It also provides them and others with the possibility of researching progression on any given issue over time in that department. Equally, it becomes possible for them or others to compare and contrast one department's experience with another. This approach is one that organises research and enquiry as a participative process that communicates inward and outwards to both individual and collective levels.

Summary of Research Level

The Shared Thinking process joins three distinct groups into the research process. They are:

1. The participants
2. The community
3. Academics

The co-constructed artifacts, when conceptualised as collective biography, open up new possibilities for research (and pedagogical practice). At the same time, a collectivist approach to research asks significant questions of current research practices that are then seen as 'authoring' others and individualistic.

I would therefore argue, based on the evidence from these case studies that Shared Thinking introduces a democratic and collectivist approach within the group of participants but also at the community level through the potential to share and compare collective biographies authored by the participation of everyone concerned.

5. Conclusion

From the above overview I feel that the first part of the hypothesis has been validated. We have been able to show an ability to extract the thoughts and feelings of the class and to make it visible. The visible display did function as a learning resource in various ways indicated above. That display was the result of reflective dialogue in the classroom.

It is important to note that these conclusions are based on a small sample. They are not conclusive and are only suggestive of possibilities. The data is limited within each case study. In addition, the case studies themselves are diverse in terms of participants and location.

This diversity is in some senses is a strength. It provides some support for the idea of transferability and additional support for the notion that identity is a recurring theme. The idea of engagement was repeated across the cases as participants related their thoughts to those of the group.

The diversity is also a weakness. We do not have the depth of data for any one case to be sure that identity is the real issue and much more research is needed. At the moment, any conclusions are speculative.

This is a new practice for the use of this technology in educational settings. The idea of students generating their own issues supported by this technology has been done before but perhaps not to this scale, not for these applications, and not using this particular structure.

As such this research calls upon nearby practices with classroom technologies (Hegedus and Kaput 2002; Stroup 2002; Hegedus and Kaput 2003; Stroup, Ares et al. 2004; Stroup 2005; Stroup, Ares et al. 2005; Hegedus, Kaput et al. 2007; Stroup, Ares et al. 2007; Carmona and Dominguez 2008; Hegedus and Penuel 2008; Ares, Stroup et al. 2009; Roschelle, Knudsen et al. 2010). Those practices are tied to Mathematics and Physics often with specialist equipment. There is much less connection in this thesis, in some senses, with literature for audience response systems (voting technologies) which have tended to be more tutor-led.

Similarly, the emerging idea of social identity as a possible theory of learning has been considered in social psychology for organisational development (Haslam 2004). There are models for the application of social identity theory to those settings (Haslam, Egginis et al. 2003) but much less in terms of a practice in that literature and no practice could be found for formal educational development.

For all these reasons, we might regard this thesis and the work described within, as a pilot. It seems that its value may be in providing a map for further work that might seek to explore, explain and perhaps to validate some of the ideas here.

Key points regarding theory and these case studies

The key point that emerges from this thesis for me is the sense that rather than looking at a socio-cultural view of learning we might look elsewhere for an explanation. Based on the idea that a socio-cultural view focuses on the relationship between the local and the wider cultural context this thesis makes an alternative proposition that we look at a psychosocial view. In such a view, the central relationship is between the individual and the immediate group.

The case studies in this thesis suggest that participants were able to relate their thinking to that of the group. This was an interdependent approach to learning that could not be

achieved without the participation of a sufficiently representative number in the class. The data in the case studies here suggests that when participants discussed ideas and concerns with a friend or colleague it was not sufficient to cause them to change. Some of this may be because they were not aware of whether their views or those of peers were representative of the whole group and it was not therefore a reliable basis for action (see cases one, three, four and five for examples of this being the case).

From there, I have coined the term 'psychosocial learning design' as a way of also looking beyond the individual in design decisions. Instead, I place the focus on the group. I have discarded a socio-cultural idea of learning as being focused on an exchange between an individual and a tutor or more knowledgeable other. In its place, I have placed the emphasis upon the relationship of *each* individual to the salient group. We might even regard a zone of proximal development as the situated social norms co-generated in the technology-rich classroom. This would be a zone that would move each individual further than they could do if they were alone.

By breaking away from the constraints of a socio-cultural view I believe we may restore agency and empowerment to the local context. The adoption of a psychosocial view of learning may link out to the socio-cultural view in a grounded manner without compromising local agency. It may also do so in a way that builds resiliency as we saw in case study three for induction. We saw this in case study four for the student teachers and we saw some signs of it in the very first case study. It is not just a case of understanding in context. It is that we are able to better understand the social group and its contemporary norms as a basis for action.

Also, a revised notion of reflective practice is implicated by this work. Rather than seeing reflective practice as a way of looking back on our own thoughts this work suggests we might reflect on the way others see the same issue. This provides a meta-level view of the issue as it relates to the group. It takes the boundary of reflective practice beyond the individual to the situated group and provides a means for the individual to reflect beyond their own cognitive capacity.

We saw this in case study four where student teachers reflected together on their teaching placements. We took the discussion beyond the peculiarities of any individual placement experience to a professional level dialogue that was focused on co-authoring a collective biography of the set of placement experiences.

Chapter 11: Conclusion

1. Introduction

In this concluding chapter I will pull out two particular themes from the case studies (engagement and belonging). These are the two themes that were repeated most often by participants and as such they may reward further consideration. I will explore these themes in preparation for a review of the theoretical issues presented in chapter two. The aim will be to understand the emerging practice called Shared Thinking in the context of learning theory. I will then close this chapter with a consideration of weaknesses in this research and suggestions for further work arising from this study.

2. Engagement Theme

Throughout these case studies, many of those interviewed used the word ‘engaged’ to describe the experience of participation in this process. This soon became a recurring theme in the research. The question remains as to what this term actually means.

We can think of engagement in relation to the idea of attention. One participant, in the last case study, said that the process had held their attention throughout and they had not used their mobile phone at any time during the session. That same person mentioned that was rare for her. She contrasted this with sessions she had attended at conferences.

Another participant interviewed felt as though this had been ‘evaluation for them’ when the process was used to reflect collaboratively on individual placements. This suggests ownership but perhaps we can think of engagement as also relevant to the participant.

One interviewee described the thought process as she considered each option before voting. She compared it to her thought process when using the technology for quizzes and tests. In the new approach she worked through the options seeking the 'best fit.' This suggests that each option was held in mind as she related each choice to her thoughts.

This is the kind of relational act discussed in chapter two for social constructivism, for example. In contrast, this person said usually it was a search for the correct answer when taking quizzes and tests. In those instances, it was a case of going through the options and saying yes or no to each of them.

Engagement seems to be a feature of the Shared Thinking process. This is process that appears to form connections between the individual mind and the group-view. This also appears to be a process that holds the attention of some participants and closes out other habits. It also seems to be personal. Some participants felt it was about them and for them.

More research is needed to investigate this in greater depth. We could argue that this is an illustration of a socio-cultural view of learning. Situated learning might fit with this view. What seems missing is an explanation of what specifically stimulates the relational act in these participants.

The notion of engagement is consistent with a process of social identification. Social identities are like switches which are activated internally or by certain social situations. When we identify with a group we align to its social norms. Individuals then relate their thoughts to those of the group. This could also be a description of engagement in the Shared Thinking process. Individuals appear to relate their thoughts to the social reality created by the group.

Engagement could also correspond to Vygotsky's Zone of Proximal Development (ZPD). In that theoretical view, we have an account of inter-mental tuning through the creation of a shared understanding. However, the idea of that as a process of social identification is not

central to that theoretical view. Inter-mental tuning amongst shared across a group, as part of such a process, has not been foregrounded in that theory.

In addition, we could see engagement as a momentary loss of ‘self’-consciousness. At such a point, we become merged into the activity or group. People sometimes say “I completely lost myself in the activity.” This has a parallel in social identity theory when we identify as members of a particular group.

At such a moment, we perceive ourselves to be like any other member of the group as we de-personalise our self and psychologically merge with the group (Turner 1975; Turner, Oakes et al. 1994). This is not dissimilar to Vygotsky but it is also distinct from his work. It may be that social identification is the mechanism for inter-mental tuning to the group and its social norms.

In this new approach, there is also the suggestion of an inter-mental zone, this time as a shared understanding amongst a group. This is activated when people are individually mindful of being a member of that group. Such an understanding may also extend beyond those present. This is reminiscent of theories such as distributed learning but again social identification is not central, as an account of engagement or cognitive activation, to that theoretical account either.

In the Shared Thinking approach, the activity seems to organise the members of the class into a shared sense of group membership. The group-view is shared amongst the group as socially-situated norms made explicit in the classroom. This can also be seen as an inter-mental zone but between peers as much as between facilitators.

3. Belonging Theme

A social identity is defined as a sense of ourselves as members of a group(s). These are groups to which we belong. Social identity theory says that dialogue and communication support the development of an ad-hoc sense of social identity (Haslam, Jetten et al. 2009).

In this research, several of the interviewees mentioned that they felt a sense of togetherness and of being a group. One participant said it made them feel like an insider. These comments suggest a sense of belonging and membership.

Reports of feeling a sense of togetherness were often associated with positive emotional responses. One student reported that it was a 'feel-good experience.' Another said that it made her feel better that she wasn't on her own. The emotional response and the feelings of togetherness suggest a feeling of identification with the group.

According to social identity theory, groups are a source of influence when we see ourselves as belonging to them (Haslam, Eggins et al. 2003). Before the intervention, one interviewee reported that they hadn't used a particular support service despite needing it. The reason they gave for avoiding the service was their perception that others in their year-group would not use that service.

After the sessions, some interviewees reported that they had already acted on some of the ideas that came out of the sessions. One tutor said that once he became aware of the way the rest of the group/department implemented assessment he changed to be the same.

This may be an example of having information rather than identifying with the group. However, combined with the affective comments above, there was a sense that part of the reason people acted on information was because it came from their peers. There were

comments made in the interviews about students ignoring information from tutors. The source of the information seems to matter.

Another example of influence was apparent from the pie-charts. They often showed how small groups sometimes abandoned their ideas in favour of other small groups. Some issues generated were proposed by small groups but then got no votes, for example.

Elsewhere, the concept of communities of practice also discusses the idea of belonging. This is the result of deepening sense of participation in the life of the community. Situated learning is a psychological perspective held by the individual of the social context. Based on the finding in this research, I speculate that 'community,' like situated learning, may also be a psychological perspective. This is one that equates to a feeling of belonging in moments of social identification.

4. Theoretical Discussion

In chapter two, I discussed different learning theories which might inform this study of classroom technologies. Specifically this involves finding a theoretical fit for a student-generated approach. I organised that review into a consideration of individual level theories, socio-cultural theories and social identity theory.

I selected various aspects of those theories and connected those highlights to other theories. Here, at the other end of this study, I aim to reflect on the case studies and relate emerging themes to those theoretical points.

Reflecting on individual-level learning theory, I suggested that learning can be seen as relating a personal view to alternative perspectives. This can be facilitated by the adoption of a stance or psychological position on a given issue. This provides the individual mind with a basis for comparison with available alternative views.

I also discussed the Social Constructivist idea of the tutor-student relationship as an inter-mental zone. In that zone, two minds communicate via a shared understanding. That mutually understood shared view mediates between the individual and the social environment.

In these case studies, individuals also construct a personal stance as they begin the process by writing down their personal view. The production of the pie-chart can be seen as a shared understanding amongst members of a class. The co-constructed pie-chart represents the view of the group and seems to mediate between *each* individual member and the social context.

I discussed socio-cultural theories of learning and the idea of situated learning as a psychological perspective. This was a perspective of the social context held by a given individual at a given moment in time. Based on this research, I speculate that we could see groups having a situated psychological perspective based on their norms and the way those norms are shared and perceived by members of that group at a given point in time.

Turner has described socio-cultural accounts of identity as pertaining to individuals in groups. In contrast, Turner describes social psychological accounts of identity as groups in individuals (Turner 1975).

The Shared Thinking practice suggests groups have agency and influence. This was also noted in Activity Theory when it was discussed in chapter two. Based on this research, and in tune with Social Identity theory, groups have agency and influence. The Shared Thinking approach could be explained as a process which shows the group and organises its influence.

In addition, we considered the idea of learning as a process of participation and enculturation in the discussion of Communities of Practice and Situated Learning. This looked beyond learning in the classroom and at learning in life as a whole. Having a

situated perspective helped explain why and how development happened within a community of practice. Individuals deepened their identity as a person in a particular communal role. This happened through participation in the cultural life of the community

In this research, the suggestion is that social identity also looks beyond life in the classroom. It is also an approach that is context-sensitive in the determination of which social identity may be active. Rather than seeing identity as embodied and determined by the autonomous individual, social identity theory suggests that groups have influence on our thoughts and behaviour when we identify with them.

This suggests that rather than thinking about participation leading to the development of an elaborated situated perspective, we might think instead of moments when a social identity is activated. Social identification would theoretically prompt alignment according to the perception of the group norms. This may be a better explanation of psychological perception and it may be more productive to discuss learning as social identification rather than simply arising from participation.

We can then think of learning as the relational act of comparison between the individually situated view and the group-situated view of the social context. In these case studies, individuals related their personal thoughts to those of the group as they decided for which option they would vote. This suggests that the act of relating our individual perspective with that of the group may be prompted by social identification. The separation of participation and identity in socio-cultural accounts may therefore be problematic in this case.

In socio-cultural theories of learning, identity is often seen as embodied within an autonomous individual. Social Identity Theory was also discussed for the way it offered a more sophisticated and shared view of identity. According to this theory, identities are often shared with others rather than being seen as something unique to a given individual. When we identify with a group, we align our thoughts and behaviour to the perceived social norms of that group.

We can see the case studies as processes which involved communication leading to the co-construction and visualization of the group-situated norms. If our participants do identify with the classroom group then they are therefore likely to relate their personal view to that of the group. This is an act of alignment. There was evidence to suggest participants felt a sense of togetherness, belonging and engagement as discussed above. There was also evidence that participants related their thinking to that of the group. This suggests that this may be a process of social identification in these case studies.

In conclusion, these case studies and the review of different theories of learning suggest that learning, at least in this process, involves a process of perspective-forming and perspective-taking. On the one hand, there are individual aspects to this practice as participants write down their view of the issue. On the other hand, participants are also influenced by the co-constructed group view.

Both cognitivist and socio-cultural accounts of learning have much to offer any analysis of the case studies in this research. The core issue is to understand how these two environments – individual and social connect. How does the individual mind become activated to initiate that relational act of comparison between the internal and external world?

Based on this study, I suggest that social identities may be the bridge between the individual and socio-cultural theories of learning. I propose that the act of co-constructing a situated whole-group perspective gives form to the socially contextualised view on a given topic. Through social identification, individuals seem to be prompted to align to the perception of the group norms here made visible in the classroom. This prompts each member to relate their thoughts and behaviour to the visible norms (the pie-chart) in their own way. Each person attends the issue of most personal significance because social identity is context-sensitive down to the individual level.

All this suggests social identity theory provides the missing and causal link to bridge, explain and reconcile the individual mind with the social and cultural view of learning.

Rather than talking about learning as participation we might productively talk instead about learning as social identification. Equally, we might think about community less as a physical group but instead as a psychological feeling of belonging. We might also think about engagement as de-personalization in a moment of social identification.

5. Learning Design

This theoretical framework and the discussion of the case studies suggest alternative ideas to the traditional view of instructional design. Conventional views see the design task beginning with an imagined typical individual that might join a course. This image prompts the selection, chunking and delivery of the right information to such an individual.

In contrast, the social identity approach, developed in this research, is centred on the development of a shared sense of group membership. As discussed above, the development of that sense of group-identity is likely to prompt psychological engagement with the ad-hoc norms which in this case would be the co-constructed pie-chart.

The goal in this approach is not to seek agreement. The aim of the Shared Thinking approach is to illuminate the diversity of thought that represents the group and its view on a given matter (Stroup, Ares et al. 2007). We are making the norms visible. This allows each individual to categorize themselves as a member of the group prompting them to relate to different aspects of those norms in a context-sensitive manner. Social identification becomes the facilitator of perspective-taking (Batson, Early et al. 1997).

Whereas instructional design is based on representative individuals, the social identity approach is based on groups and group membership. I suggest that Shared Thinking may provide a practice based on social identity theory. As such, Shared Thinking may provide a practical and theoretical bridge between individual and socio-cultural ideas of learning.

The key to any learning design is to bridge between the individual mind and the social environment. This needs to be a consideration for each person involved. The challenge for the tutor is to form a bridge between the two and to do so in a context of cognitive diversity. Based on this research, the suggestion is that the classroom and group membership can function as a mediator between *each* individual and the social world.

Using this new approach, we begin with the group as the basis for learning design. The Shared Thinking approach described in these case studies organises a dialectical relationship between individuals and the whole-group. Each has an influence on the other. This way, each person had the ability to use the group as a learning resource. Each individual can focus on the aspects of personal interest.

The goal in this new approach is to illuminate the diversity of issues on a group-relevant topic. This provides each person with multiple perspectives. As one interviewee said, this way all the answers are correct. This is in contrast to the conventional use of the technology to set tests and quizzes.

This contrast between instructional design and social identity approaches to learning is illustrated in the use of classroom technologies. The conventional use of classroom voting technology is to set a quiz or test for individuals to answer. The tutor declares which answer is correct and gives feedback accordingly.

The data (in case study four for example) suggested that participants also used a different thought process for this new approach when compared with the conventional use of this technology. Rather than sorting through the options for the right answer, the participants appear to consider each option and relate it to their own thinking sorting for a best fit.

This search for the best fit can be seen as the individual mind relating to the external environment. They seem to do this in a relational approach that compares an internal stance with the external options. This was also discussed in the theory discussion in

chapter two where I considered perspective-forming and perspective-taking as part of the development process. I am suggesting the prompt for doing this may be social identification which seems to be missing from the instructional design approach despite common use of the term ‘learning communities.’

There are, of course, some situations where there is a correct answer. As such, this approach to learning design may be more useful for some applications than for others. Even so, there may also be other ways of using this approach for such instances. For example, it may be possible to make the activity into an investigation into different ways of achieving the ‘correct’ answer (Stroup, Ares et al. 2004). More research is needed to explore that in greater detail.

The case studies have already shown different structural possibilities for learning activity using this approach. We can therefore look at this process from a purely structural perspective on learning design. We can look at how to work with different features of this structure. This can include different ways of working within and between sessions using this approach.

Even so, any structural view of learning in this approach is always in service to the main goal which is to organise dialogue and interaction which will lead to a shared sense of group-identity and membership. In addition, the tutor role is also interesting here. In case study four for example, the orientation of the session was changed from an inquiry into concerns to one investigating positive aspects of student experience.

Working with disposition in this way can be seen as the curation of social identity. The tutor works to organise different views of the group as a collective learning entity. This curation process extends to other aspects of this approach. Putting one pie-chart next to another creates a wider view of the group. Similarly, running different numbers of cycles of the Shared Thinking process offers other views of the group experience as part of this curatorial activity.

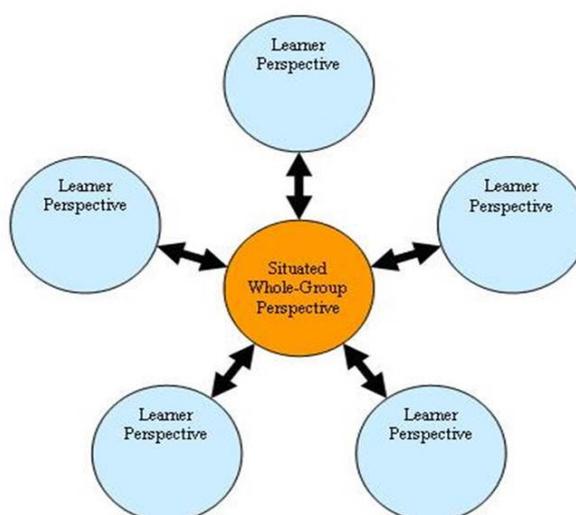
In summary, this approach to learning design differs considerably from instructional design. It is organised on very different principles. Firstly, it is organised to address the group rather than the idea of representative individuals as the basis for learning design. Structural aspects remain important as different ways of working with the whole-group and as a vehicle for generating different views of the group experience.

More importantly, the structure is not seen as a choice of possible starting points which seek to achieve the same end. Instead, the structure has the purpose of generating a shared sense of group membership and social identity. This sense of group-membership is the only common end-point using this approach.

In addition, the group has agency in the learning process. It has agency for the way the process leads to a synthesis of the dialogue (structural) but also psychologically in terms of social identification. The starting points and the outcomes are acknowledged as different for each participant.

Figure 23 (below) is a representation of the Social Identity Model of Learning. It uses a social identity based approach to design, learning and teaching. Following this, Shared Thinking is a practice for the technology rich classroom. The model is intended to highlight the relationship, the interdependence and the social influence organised in this approach to learning design.

Figure 23: Bowskill's Social Identity Model of Learning



This model has emerged retrospectively over the duration of this research and from the process of writing up this thesis. It may be more accurate to locate the above model in a wider constellation of similar implementations. This would provide a way of linking to a grounded socio-cultural view of learning and the relationship between different groups and sub-groups.

6. Pedagogy

The technique that was to become Shared Thinking uses a combination of a snowball group discussion technique and classroom technology. In doing so, the activity moves from the individual to the small group and up to the whole class. The core of Shared Thinking, used as a pilot for the thesis, was as follows:

- Individuals write down their personal view on the topic-focus
- Move into small groups to share individual views
- Each group identifies one aspect to be recorded on the screen
- Create a set of question-options from the discussions
- Each individual votes on the aspect they see as most significant
- Voting generates a pie-chart on the public screen
- Plenary discussion on issues arising

Over the next 4 case studies several variations of this practice were used. These were developed to respond to the particular needs of the situation. They were also modifications made to suit the particular audience and the time available.

Regardless of the motivation for these changes, it appears that a psychosocial learning designer has a set of variations available. All of these use the basic idea that the participants discuss their concerns and build their agenda by reflecting together.

We used three cycles in a single session in case study four of this thesis. That was the most we ever did. We did that in negotiation with the tutor as a way to support the participants to explore different aspects of their placement experience. These were student teachers in their final year of study. A good deal of further research is possible here in order to explore a variety of other possibilities for new variants of the core technique.

6.1 Activity Blocks

From the first case study, there are a number of ‘activity-blocks’ that can serve as pedagogical tools for the tutor. They included:

5. Cycles of Shared Thinking – this refers to one complete sequence that starts with an individual view and goes through to a display of the display of the whole-group view.
6. Re-use of the artifacts – this is where the pie-chart generated from a cycle of Shared Thinking is used again. This might happen within a session or in a subsequent session.
7. Grouping (Anderson, Anderson et al. 2006) – this is where pie-charts are placed side-by-side on the screen in order to explore change at the collective and comparative level.
8. Linking different sessions – this is where artifacts are used to bridge between sessions or to connect different groups.

These activity blocks offer tools for psychosocial learning designers and tutors. They may help organise planning and implementation within and between different Shared Thinking sessions. Further research is needed to explore each of these in greater detail. That additional research could also be useful to examine the linking of these blocks and different applications, issues and outcomes.

6.2 The Tutor's Role

I made the argument, above that the most useful view of this practice is to regard it as a social identity approach. So what might that imply for the tutoring role?

Throughout these case studies, we organised views of the whole-group in a variety of ways. For example, we worked with the dispositional orientation to the session in the student-teacher case study. There we framed the session as an inquiry into the positive aspects rather than the concerns of the students.

In several of the case studies, we generated views of the whole-group on different aspects of their experience. The first case study looked at concerns at the start of the first year then concerns for the same group at the beginning of their second year.

These are all examples (discussed in more detail under pedagogy above) where the tutor can be said to organise different views of the group. Doing so, has benefits for both the participants and the provider. In this respect, and bearing in mind the theoretical discussion above, the tutor can be said to be the curator of social identity.

In carrying out that role there are also elements of 'orchestration' (Crook 1996; Crook 1998) and the tutor as cognitive expert (McConnell 2000). This is distinct from Salmon's idea of facilitating gradual independence from the tutor although this is partly because we are more concerned with inter-dependence amongst the students. Above all, I would argue

that the curation of social identity is perhaps the most distinctive feature of the tutor role in this approach to learning.

7. Weaknesses in this Research

This is a small set of interventions. That alone may be regarded as a weak basis from which to draw any definite conclusions. It may be useful to carry out further investigations and to develop a number of case studies based on a single setting. This might add depth and greater certainty.

Related to this, is my awareness that there was little similarity between one case study and another. This was a strong point and a weakness. On the one hand, the ability to implement modified versions of the same design suggests flexibility. It also suggests that the design is transferable. More specifically, it suggests that when similar issues occur in such diverse contexts we can have a certain amount of confidence in the reliability or validity of those themes.

Although this thesis has described work done to investigate issues such as scale and a particular application, we have limited data and analysis for each of these variables. We do not know the limits of scaling and the effects of scaling up the intervention. We know that it can be scaled up from a group only just into double figures to one populated by several hundred participants. We do not know the issues raised and the features and issues within the scaling of this process. More research is required to investigate other cases and contexts in which scale is a factor to fully understand these issues.

In addition, there were only a small number of people interviewed as part of this research. The reasons for this were partly due to logistics – what was practical for one person to undertake and to do so in the context of the other activities in this research. Even so, a handful of tutors and not many more students are dangerously small as a basis for making

grand claims. Again practicalities collided with opportunities but despite these circumstantial issues more needs to be done to deepen the data.

One major weakness and one that I deeply regret is my failure to conduct interviews with the 2nd year students that participated in the first implementation in Case Study 1. This is a major flaw that may have saved any number of mistakes or that may have saved a lot of time and allowed a different focus on subsequent implementations. Different designs and activities might have been developed had better data been available.

The affective outcomes may be worthy of further research. The first session in Case Study 1 served as a benchmark for all that followed. The excitement of seeing the design work in practice and work so successfully was a surprise. It generated a real sense of electricity in the room. From the few comments made by tutors and participants, it seems that others were equally positive. The impact of these feelings upon individuals and upon the session was never fully explored.

The practical organisation of the room, the layout of the tables, the numbers involved and the number of groups was something that could have warranted further investigation. These different case studies had different environmental factors that were never fully investigated.

The first case study also provided a remark by one of the tutors that she had avoided group learning because of a disruptive group. She noted how this session removed that disruptive influence. There is a lot more work that might have been done and that needs to be done in the future on this issue of behaviour-management and group-learning.

Some of the case studies involved relatively few participants. There was always a question as to any real value of the Shared Thinking process in groups of that size. There was however one session in the third case study in which mentors were prepared using this kind of process (minus the voting). It was interesting to note at that time how the screen

scaffolded the discussion in the group. More work could have been done to explore the idea of Shared Thinking for smaller sized groups.

The case studies chosen were a consequence of some planning and some opportunism. Whether the cases chosen displaced other, possibly better, case study opportunities is an issue. However these were the cases that presented themselves in the time available. They were also those most accessible to me. Despite some concerns these cases did yield some valuable data and insights. Whether it would have been better to carry out all the case studies in the same institution or the same course may be regarded as a feature if not a weakness.

This research is essentially qualitative in nature. This is far from any experimental work done in a laboratory. It is not work that can ever hope to control key variables. However, in some respects this inability to confidently generalize, or to be able to make definite conclusions, arises from this being fieldwork in naturalistic classroom settings. Again this could be regarded as a weakness. There may be potential for further work using other methods to make a useful contribution.

These were interventions that were true to the principles of an interpretive approach. These are case studies in which we sought to address, and collaboratively resolve, specific problems in particular naturalistic settings. Within such a framework, the Shared Thinking design was modified across these different settings. As a consequence, the same approach was not trialled in each setting or for each application. This could be seen as a weakness.

It is also unclear as to how useful or applicable the ideas in this thesis are to learning in different knowledge domains. For example, would a Shared Thinking approach have value in Science as much as in the Arts? There are ways in which this approach could be organised to illuminate the diversity of thought on equations or other factual material. More research would be needed to investigate how effective or supportive such approaches might be.

8. Future Work Identified by this Thesis

There are a number of new areas of research suggested by this work. The application of social identity theory to learning is rare and there is much work to be done developing research on this theory in relationship to other learning theories.

The application of this theory to the case studies included in this thesis suggests further work that could be done for those same applications in other contexts. There is also an opportunity to develop new applications of this theory.

The Shared Thinking practice has suggested a great deal of flexibility in the possible learning activities. This is despite the apparently highly structured environment. There is much work to be done exploring other activity structures including multiple sessions.

We showed how it was possible to group the artefacts within and from the Shared Thinking sessions. This allowed for the creative re-use of these products for different purposes. The ability to frame and re-frame the session in this way suggests further research that could be done.

We have linked different sessions in the one case study. We have also connected different groups. The mixing of sessions and groups warrants further research to understand the features and challenges of different combinations. There may be other groups that could be usefully connected in different applications.

There is considerable potential to explore the possible links between the online and the face to face environments. Considerable research opportunities are suggested here for blended learning in different contexts and to explore different relationships between the two environments.

Having suggested several possibilities, it is worth highlighting two areas of further research implied from this thesis that were not formally part of this project. They are the opportunities for further research to investigate student experience and research into Open Educational Resources as it relates to course design. I will discuss these in more detail below.

Investigating Student Experience

The first of these relates to the investigation of student experience on courses. This kind of work commonly uses survey technique or focus groups as the key method. It is, for example, common to carry out a questionnaire survey using paper or online strategies. This is largely for the tutor's benefit enabling them to evaluate the course.

In addition, from a tutor perspective, such surveys take a considerable time to design, implement and analyse. There is likely to be a considerable time between the conception of the survey and the final reporting of the results. The tutor in Case Study Four provided one example of the way he was able to uniquely gather useful data on the student placement experiences quickly. As such he was able to understand his cohort and use the data from the session to contribute towards a report to OFSTED. That data was generated in two sessions each lasting two hours.

It is equally rare to obtain 100% participation or response from surveys using questionnaires to investigate student experience. This only compounds the general difficulty of comparing data from one cohort or one sample with another. The Shared Thinking approach offers considerable opportunity to investigate student experience at the collective level. It also allows this to be done quickly and to sample 100% of those involved. Moreover, participation in such a survey offers development opportunities for the participants as a return for their input. As one student remarked in Case Study Four it was evaluation for them.

It is also possible to compare and contrast collective experience over time for a given cohort or between one year-group and another. There are some major opportunities for further work that are waiting to be done in this way. It is easy to imagine investigations across an institution or between the same courses in different institutions as just one illustration of this potential.

Course Design and Open Educational Resources (OER)

A second area for potential development relates to course design. In the area of technology-enhanced learning there is currently a significant interest and a developing literature on representations of course designs to support the transfer of e-learning practice from one place to another (Goodyear and Steeples 1998; Goodyear 2005; Conole 2008; Conole and Culver 2009). The ability to create such representations in digital form allows different practices to be captured and shared online. It also helps to contribute towards the development of repositories for course designs, sometimes referred to as ‘pedagogical patterns’ (Goodyear, de Laat et al. 2006).

These researchers, investigating representations of course designs, continue their search for an ideal format to support the transfer process from one context to another. They use technology to support the transfer of technology-enhanced practice to other practitioners. These representations are effectively serving as templates for course design.

The weakness of this process is that they omit the student experience. This is important because we know that any course design is experienced differently by each cohort. A course is enacted differently by each set of participants through their dialogue and interaction. From this perspective, we might even suggest that the wrong part of the course is being used as the focus and the determinant of transferability. We could argue that the collective experience of the course, as the key part, is missing from such representations.

It is the ability of Shared Thinking to represent the collective experience of a course and to do so easily and efficiently, at different milestones in a course, which makes it ideal to inform transfer. This might offer a substantial enrichment of repositories containing representations of course designs.

These two illustrations are just a hint of future research waiting to be done. I have added these to the summary below:

- Further work on whole-group enquiry as an extension to existing enquiry-based learning processes
- Further work on formative assessment and specifically self and collective assessment as well as further work on feedback from a whole-group
- Further work on Shared Thinking pedagogy including the identification of additional activity structures
- Further work on the utility and impact of using a Shared Thinking approach in different contexts.
- Further work on network-mediated learning and the use of technology in the classroom as a unique technology-supported practice and in relation to other networked learning approaches for different audiences and contexts.
- Further work in psychology for the development and exploration of social psychology and issues such as perspective-taking, social identity, social norms, situated group-identity etc. etc.
- Further work on group learning and group development
- Further work on reflection and reflective practice
- Further work on work-based and work-related pedagogy worthy of Higher Education
- Elaboration and enrichment of research being done on the student experience
- Enrichment of existing work on course designs and evaluation of courses
- Further work on induction and transition using Shared Thinking in various contexts
- Further work on mentoring through the use of a Shared Thinking approach
- Further work on professional learning in different and in distributed settings using the Shared Thinking approach
- Further work on the development of collectivist theory and pedagogy using Shared Thinking

- Further work on popular theories of learning to check, verify, modify and develop individual theories and also to develop our understanding of relationships amongst different theories of learning
- Further work on collective biography in education

9. Final Remarks

On reflection there were a number of milestones on my journey to reach the end of this thesis. In no particular order, they included:

- The idea of learning as situated perspectives related to those of others
- The shift from learning design as a managerial issue to one based upon social identity
- The shift from learning based on socio-cultural theories to one based on a psychosocial perspective
- The shift from individual agency to the agency of the group
- The shift from individual narrative to group biographies
- A previous and growing belief that relationships might be important in learning

In trawling the literature for possible ways into this thesis, I was focused upon the relationship between the individual and the group in learning. That was something that appeared to fit with the use of electronic voting systems.

My ideas started with perspectives, perspective taking and perspective development. I thought that might explain what occurred when using this technology. I thought participants were relating their thoughts to those of others and that seemed to be true. The puzzle was why they did and to what extent they did that. The trigger seemed to be empathy. The idea of an interest or feeling towards others prompting individuals to try and understand the way that another person might think and feel. I still think empathy is part of the story but not the main explanation.

The biggest shift was from an instrumentalist view of Shared Thinking to one based on social identity. The discovery of social identity came from two sources. The first was discovering the work of Claude Steele and his work on stereotype threat (Steele 1997). The notion that we might be influenced by the way we think about ourselves in social settings was fascinating to me. It was an idea I'd never encountered before.

I began to read more about social identity and self-categorization. I became curious about whether people were relating their self-perceptions to others in Shared Thinking sessions. To explore this further I found a social psychology conference and decided to go in order to see if I could meet anyone there who could offer some signposts.

A presentation by Andrew Frain, a student at the Australian National University, helped considerably and he was invaluable in allowing me to test my developing ideas by email when I returned to the UK. Andrew's work was on social identity theory and as I raised new questions coming from the data he would point me to relevant literature.

Another big shift was from a socio-cultural view of learning to a psychosocial way of thinking. I was looking for some way of tying down development and agency to the classroom. I kept resisting the idea that we were always embedded in social systems as though our fate was sealed. The charts generated in the Shared Thinking sessions seemed to be an expression of agency that communicated an agenda and demanded a response.

I later came across the work of Joshua Miller, a social worker in America who was involved in disaster relief. He discussed psychosocial capacity building as a way of working with sufferers so they were able to draw support from within rather than being told what was good for them. That gave me the key. I was no longer a hostage to a purely socio-cultural view of learning which seemed vague in the context of classroom. At last, I had a licence to think about the group level as the orientation for learning design.

I am not claiming that psychosocial learning design, social identity theory or Shared Thinking practice is a universal panacea. It may be useful in some situations and less so in others. I am suggesting that this is a different way of thinking about design, theory and practice in the technology-rich classroom. It may be offer one explanation of learning in such settings and a way of theoretically and pedagogically unifying a diversity of contemporary practices in such environments.

Closing Words

I reviewed individual theories of learning (Constructivism and Social Constructivism) and highlighted perspective-forming and perspective-taking as important in those theories. I also noted the significance of a shared understanding as the mediator between individuals and tutors in Vygotsky's Zone of Proximal Development.

I reviewed socio-cultural theories of learning (Activity Theory and Situated Learning & Communities of Practice). I highlighted collective agency and the socially contextualised level of development discussed in Activity Theory. I also highlighted a psychological perspective of the social context for a communal role. This was done in my discussion of Situated Learning.

I noted identity as central to Communities of Practice. In that framework identity was presented as a deepening perceptual field of the communal role. This is held by an individual and it is said to result in a sense of becoming through participation. In response, I have argued that the perceptions of others, those holding the same social role, is missing in this theory. I have suggested this is important because the set of perceptions (the social norms) must be a reference point for everyone with that role.

Taking these theoretical accounts of learning on board, I was interested to pick up on the issue of collective agency which is part of Activity Theory. I was also interested to pick up on the psychological perception of the communal role implied by situated learning. It

seemed that identity may hold the key but the current account of identity in socio-cultural theories of learning appears incomplete.

I suggest that a more complete account of identity may need to also reflect the communal level of perception for a given role. This set of perceptions would be a reference to the social norms of a group. This is a shared understanding in the widest sense (a social and collective level of shared understanding in an adaptation of Vygotsky).

I therefore proposed Social Identity Theory as useful because it is focused upon the group as the source of influence upon its members. This theory has the collective agency of Activity Theory in the idea of group identity which acts as an influence on individual thought and behaviour. It provided the shared reference point of the group identity and its social norms. It was also individually context sensitive because those norms are perceived by each individual differently (as in Situated Learning).

This theory thereby takes account of the ideas in Situated Learning and Activity Theory. At the same time this is a more sophisticated view of identity as it relates to a communal reference point as much as it does to individual perception.

Finally, I suggest that social identities, as the reference point for a given communal role, may be the missing bridge between the individual mind and the socio-cultural level in theories of learning. Here, we have the idea of social identification as a psychological mechanism that coordinates social activity in different situations. This seems to correspond more closely to the relational structure of the Shared Thinking process.

I have therefore proposed Social Identity Theory as a theoretical framework for the Shared Thinking process. This is one that takes individual and socio-cultural theories of learning as both valid as explanatory contributions to this research. However, I argue that it is Social Identity Theory that brings theory and practice together in a more sophisticated manner than either of those theoretical sets can do alone. This is achieved through the use

of socially shared reference points, individual perceptions and moments of social identification.

List of Appendices

Appendix 1: Differentiating Respondents in Case Study 1

Tutor 1 = Course Director/Tutor 2 = Course Tutor

Student 1 = Young Female 2nd Year Volunteer

Student 2 = Young Female 2nd Year Volunteer

Student 3 = Young Female 2nd Year Volunteer

Student 4 = Young Female 2nd Year Volunteer

Student 5 = Young Female 2nd Year Volunteer

Appendix 2: Differentiating Respondents in Case Study 5

Tutor A: Tutor new to the department

Tutor B: Director of Learning & Teaching

Tutor 1: Tutor in the department

Tutor 2: Tutor in the department

Tutor 3: Tutor in the department

Tutor 4: Tutor in the department

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