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THE INFLUENCE OF CULTURAL DIVERSITY ON STUDENT LEARNING INTERACTIONS: A QUALITATIVE STUDY OF RAPPORT MANAGEMENT IN AN UNDERGRADUATE PROBLEM BASED LEARNING GROUP

LESLIE ROBINSON

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Abstract

The aim of this research was to determine whether cultural diversity had any impact on the quality of learning interactions used in Problem Based Learning (PBL). This qualitative, interpretive study followed one culturally diverse group of 11 students on their first year of an undergraduate Diagnostic Radiography programme. Data comprised video footage of 10 PBL tutorials, and individual and focus group interviews, collected over the period of one academic year between 2007 and 2008. A Grounded Theory (GT) approach was used to manage the data and construct the argument. Interactions were explored using Discourse Analysis (DA), employing the constructs of Face, Politeness and Rapport Management (RM) to understand how students managed the communicative demands of PBL to achieve their learning goal. The study found that PBL requires students to engage in face-threatening behaviours to a greater extent than more traditional learning methods, because it expects the students to discuss subjects of which they have little prior knowledge and then puts student centre-stage for planning learning objectives and delivering the learning to others. Members of culturally diverse learning groups may have difficulty in finding a common strategy of communication for PBL because their differences make it difficult to predict how they will be judged by others in the group. Furthermore, reducing social distance, which would overcome this dilemma, is more difficult in groups where the individuals are culturally diverse. Age diversity, as an influential factor, featured highly in the group studied. A Sociopragmatic Interactional Principle (SIP) of equity-autonomy predominated in the group's interactions as a result of these issues. This ethos meant that the students opted for superficial learning interactions which were confirmative rather than critical. It appears the strength of Face Threatening Acts (FTAs) in PBL is extremely high for such a group and that the impact of socialisation for reducing social distance, inhibited because of cultural diversity, has an influential role in reducing the impact of face. The findings of this study can be used by tutors to understand the communicative demands made on students in PBL. Face threat might be lessened either by giving students more freedom to feel they are in control of the PBL tutorial rather than being constrained by notions of the 'right' and the 'wrong' way to participate, or conversely, providing a more structured process to legitimise FTAs. The developing ethos of the group may help to identify which of these approaches is most suitable to the needs of the group. The study also highlights the importance of promoting off-task social engagement for PBL groups, especially culturally diverse groups where members do not normally socialise outside the tutorial.

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Glossary of abbreviations

FTA	Face Threatening Act
GT	Grounded Theory
HE	Higher Education
HESA	Higher Education Statistics Agency
NHS	National Health Service
PBL	Problem Based Learning
QAA	Quality Assurance Agency (for Higher Education)
QCDA	Qualifications & Curriculum Development Agency
RM	Rapport Management
WP	Widening Participations

Chapter 1: Introduction

The aim of this study was to investigate how a small group of culturally-diverse, first-year undergraduate Radiography students engaged in Problem Based Learning (PBL) in and English University. Using individual accounts of their lived experiences, and video footage of interactions during PBL tutorials, it explored how the group and its individual members developed and how their communication strategies influenced learning outcomes. In particular, it aimed to identify whether cultural diversity in communication was an influential factor in these things.

The following introduction will explain why this is an important area for research by first defining the terms, and then arguing that in order to construct knowledge together, students need to have a shared understanding of communication. It will suggest that diverse classrooms, which are an increasing feature of Higher Education in the UK in the 21st century, may make such communication difficult.

What is PBL?

PBL is a small group learning method which is initiated by the presentation of a problem or trigger. Students discuss the learning required to gain a better understanding of the issues related to the trigger and are guided towards their own set of learning objectives. The objectives guide the subsequent learning which is usually undertaken individually, i.e. a period of time during which students study on their own. The group then reconvenes to share their learning and co-construct new knowledge (Barrows, 1986). Discussions are usually directed by the students: one student is usually nominated as 'chair', whose job it is to keep the discussion on track, and another is nominated as the 'scribe', whose job it is to take notes (Wood, 2004).

The PBL tutorial is usually structured according to an agreed problem-solving strategy, the original of which was proposed by researchers at Maastricht University (Schmidt, 1983). It is widely known as the Maastricht 7-jump model and involves the following 7 stages:

1. Identification of terms and concepts not understood and which need clarification

2. Identification of the focus of the problem
3. Through brainstorming, re-call of previous relevant knowledge , identification of what is already known about the topic and what explanations can be made
4. Elaboration on the previous stage, discussion of what possible explanations remain, listing that which remains unknown
5. Creation of learning objectives for intervening study period
6. Period of individual study
7. Feedback – discussion and construction of new level of understanding as a result of sharing learning and perspectives
   (A more detailed outline is presented in Appendix 8)

Current models of PBL have evolved however, and may differ significantly from the one originally described by Barrows (Maudsley, 1999; Wood, 2003; Macdonald and Savin-Baden, 2004). More, broadly, PBL curriculum design is now diverse. In fact, Savin-Baden recently described seven modes ranging from a single module of PBL to a fully integrated curriculum approach (Savin-Baden, 2003). However, one of the defining factors is whether the problem drives the learning (problem-based) or is the purpose (problem-solving) (Ross, 1997). In the first instance, students have no prior knowledge of the problem content, whereas in problem-solving curricula problem-solving skills are addressed in scenarios where the students require prior knowledge about the problem (Ross, 1997). This is an important distinction as students may be more willing to participate when there is no expectation that they should have the 'right' answer. Conversely, they may be less willing to speak up if they feel they have no foundational knowledge.

Even within problem-based curricula more closely aligned to the original model, as defined above, there exist differences in structure and processes. Ross (1997) suggests these differences can be associated with:

- The person or group who selects the problems (educational team or students?)
- The purpose for which the problem is selected (e.g. to cover specific content or concepts, to guide students to a particular field, to demonstrate a typical problem faced by the specific profession, or for its motivational effect)
- The form in which the problem is presented to the students (e.g. an event, a statement, a set of questions, an artefact such as film or lab reports)

- The way students identify the resources they will need (determined by the educational team or the students and from a specific list or from any resource)
- The processes that students follow in their work (e.g. are they in groups with a facilitator or working as individuals?)

This list has been adapted from Ross (1997 p30) but there are further variations such as the number of students in a group, the length of time they have to work on a problem, the number of times they meet to discuss the problem 'trigger', the number of triggers per unit of study, the way the work is distributed between the students, the methods chosen to present their findings at feedback, and the methods of assessment.

Clearly, given the variety of curricula that have been described under the PBL heading, it is important for PBL researchers to define their own study context-specific definition. Therefore Appendix 2 provides a summary of PBL as used in this research.

Importance of collaboration and communication for PBL

Regardless of the specific model used, another fundamental feature of PBL is that it is collaborative because students have to share their learning to reach joint learning outcomes and it is therefore based on a socio-cultural constructivist theory of learning. It is a particularly good fit to the work of Lev Semenovich Vygotsky (DeVries, 2000; Harland, 2003). Vygotsky perceived learning to be student-centred rather than teacher-centred and that learning is a result of the learner as active participant rather than passive knowledge recipient. He also believed that learners develop their own mental models (or 'schema') to understand constructs based on previous experience and understanding and that new learning requires an elaboration or re-configuration of these schema. Broadly speaking, this approach is termed a constructivist theory of learning as the student constructs their own understanding of new knowledge which will be individual to them.

Vygotsky's ultimate concern was how the individual developed cognitively through the eventual internalisation of *social* processes. He therefore also emphasised the importance of the influence of other people and the contextual and environmental

factors on learning, including the necessity for those such as parents, teachers or more able peers to guide this discovery. Vygotskyan constructivism is therefore also referred to as social constructivism (Liu and Matthews, 2005). However, unlike those social theories of learning in which the individual is not autonomous but is totally influenced by the situated context of the learning activity, such as Lave and Wenger's Communities of Practice (Lave and Wenger, 1991), Vygotsky sees individual internalisation as a necessary second process to the initial social encounter. In other words, learning takes place on two "planes", first on an inter-personal plane with others then on a second intrapsychological plane. Effective communication between learners is therefore crucial to the process of sociocultural learning and Vygotsky stressed the importance of semiotic mediation tools, the most important of which is language, based on a shared cultural and/or historical understanding.

For Vygotsky then, and similarly for PBL, learning takes place when participants together develop their own understanding of the subject matter. These collaborative co-construction processes have been described variously as: challenging ideas, evaluating evidence, considering options and reaching agreement (Mercer, 2008), making knowledge explicit, conceptual change, co-elaboration of new knowledge, and the development of verbal articulation skills (Baker 2004 in Andriessen, 2006) and, applied to PBL, have been classified as: cumulative reasoning , exploratory questioning and handling conflicts (Visschers-Pleijers, Dolmans et al., 2006). These are complex interactions and it is clear why Vygotsky stresses the importance of a set of *common* semiotic mediation tools. But what happens if the learners do not share a common understanding in communication? Can PBL work in culturally diverse groups?

The relevance of diversity in PBL as a context for this study

Many believe that collaborative groups should be diverse (Taylor and Burgess, 1997; McLean, Van Wyk et al., 2006; Mills, Woodall et al., 2007; Singaram, Dolmans et al., 2008; Singaram, van der Vleuten et al., 2010) as collaboration promotes consideration of others' perspectives, and the more diverse these perspectives are, the richer the learning experience. Students thus develop an ability to argue from a standpoint of relativism rather than absolutism (Kuhn, Shaw et al., 1997). So pedagogically, diversity in learning

groups is advocated and configuring learning groups to produce inhomogeneity in this way is seen as a good thing. Furthermore, changes to social and educational policy in the UK, in the early 2000's(Department for Education and Skills, 2003), which resulted in the Widening Participation and Lifelong Learning agendas, have led to increasingly more diverse cohorts of students (Burr, 2008).

The UK Government policy for Higher Education in the early 2000's was aimed at ensuring 50% of 18-30 year olds would be participating in Higher Education by the end of the decade (Department for Education and Skills, 2003). This target was seen as an outcome measure in respect of the Government's rationale to tackle social injustice by providing the opportunity to aspire to graduate careers for all (Newby, 2004). The outcome has been an (albeit small) increase in recruitment of students from non-traditional backgrounds, such as Black and Minority Ethnic (BME) groups and females from lower socio-economic groups (Burr, 2008). Equality and diversity legislation and, in particular, the notion of positive action has also driven increased marketing activity to BME groups (Robinson, Burns et al., 2006) particularly for those disciplines that have not traditionally attracted such applicants, such as subjects Allied to Health (Oikelome, 2007). Recruitment of non-white groups to these disciplines remains low at 7.7%., (UCAS, 2010) however, so that students from these groups remain a minority in the classroom. Such isolation can have an impact on social integration impacting on communication and the student's willingness to engage in classroom discussion (Mills, Woodall et al., 2007; Woodward-Kronn and Remedios, 2007; Singaram, van der Vleuten et al., 2010).

At the same time, as a result of changing attitudes to lifelong learning (Field, 2006) there has been an increase in the number of mature students (above the age covered by the WP agenda) applying to university. This is particularly the case for health-related programmes, and has resulted in cohorts of students with a wide spectrum of qualifications ranging from masters level post-graduates, who already have a higher degree, to those whose recent educational experience consists of study on a level 3 transition to Access to Higher education programme (UCAS, 2010). Access students have been shown to have difficulty accommodating to their new role as learner and, like

minority ethnic students, finding their voice in classroom discussions (Blue, Stratton et al., 1998; Brine and Waller, 2004).

With such a diverse cultural mix, it may be difficult for a group of students to find a common communication strategy. How would students who struggle with their own sense of identity as a learner and co-learner fair in a discursive learning environment like PBL? Furthermore, could such a diverse group present with shared semiotic tools? If not, how would this impact on collaboration which is so essential for socio-cultural constructivist learning?

Communication according to Rapport Management

In order to analyse this problem a theoretical framework described by Helen Spencer-Oatey as Rapport Management (RM) has been used. This theory of communication posits that in order to achieve some interaction goal, the interactants apply tacit communication strategies, to manage their relationship with particular attention to maintaining (or not) their own, or others', 'face' (Goffman, 1967) or self-esteem. The strategies are based on a common understanding of what is appropriate in communication and this is determined by cultural and historical factors. In addition, contextual constraints related to roles, regulations, rights and obligations govern communicative choices. In communication with someone from a different culture, what is taken as acceptable and what constitutes loss of face (a face threat) may not always be clear or shared. RM has also been shown to be influenced by social and power differentials between interactants.

RM therefore suggests communication is easier where participants are from similar social, cultural and historical backgrounds because they will have a shared understanding of what is acceptable. In a group of students who are diverse and unfamiliar with each other, failure to manage rapport may impinge on the important task at hand; i.e. learning. Thus, the aforementioned benefits that diverse perspectives can bring to group learning may not be realised because of the difficulties in communication which are

thought to be magnified when cultural diversity exists between interactants (Brown and Levinson, 1978; Spencer-Oatey and Jiang, 2003).

Impact of group social relationships on learning

According to facework theory, (Goffman, 1967) face threat to self and others is greater when the social distance and or relationship between collaborators is large because there is less security in the relationship. In their seminal work on classroom behaviour, Barnes and Todd (1977) identified a spectrum of social interactions with two extremes in the learning groups of school children. At one end there were personal clashes and disputes. This was clearly unproductive for collaboration. However, at the other end the groups were so concerned with harmony and preserving "an unruffled surface of consensus" that they avoided differences of opinion. Mistakes were left unchallenged and the group put the social harmony of the group before their need to develop cognitive strategies. Nelson and Aboud (1985) and Azmitia and Montgomery (1993) also showed that groups of learners who were friends rather than acquaintances found it easier to expose their views and to challenge each other. They suggested that this was because the friends knew the conflict was not likely to be detrimental to their friendship. It is thus important to get the social relationship between the group participants right if the tricky process of conflict is to be managed effectively.

This supports assumptions made in the facework literature of Grice (1975), and taken up later in Brown and Levinson's politeness studies (Brown and Levinson, 1978) and Spencer-Oatey's RM,(Spencer-Oatey, 2008) which identify the role social relationships have in the way interactions are managed. These authors concur that social distance between the interlocutors and perceived power difference between interlocutors influence the management of interactions as well as the rank of imposition (how costly the interactional goal is for one or both of the speakers). These factors were originally labelled *d, p* and *r* respectively by Brown and Levinson in their politeness studies from which much of the subsequent communication management work has emerged. Helen Spencer-Oatey also adds a fourth consideration which she believes impacts on interactional communication strategies which is the number of participants (2008). This

enables the theory to be considered in the context of group interactions which has not previously been the focus of most interactional and facework studies.

Weight of the task in PBL

What is the weight of imposition of a Face Threatening Act (FTA) for students undertaking learning in a collaborative group? They are neither passive recipients of information, nor are they engaged in dyadic interaction, i.e. with only the teacher as 'the other', as is the case in a didactic classroom. In their interdependence, students are required to make requests of others and engage in disagreements where necessary. Furthermore, in PBL, they are expected to highlight deficiencies in their own and others' knowledge, engage in teaching activities such as making presentations and lead other students by directing and proposing learning activities and outcomes. It is possible then that, of all learning methods, PBL makes greater impositions on students so that the weight of interactions between students is high. When a student, acting in the role of chair person, asks another to present information for scrutiny, this is a 'big ask'. Furthermore, these interactions and subsequent actions of the person being imposed upon do not occur between two people in isolation, but in front of the rest of the group and the tutor who are also active beneficiaries of the interactional outcomes. Embarrassing and rapport threatening PBL interactions are therefore constantly played out in front of a wider audience.

This research therefore aims to explore the developing discourses in a group of diverse students during the first year on a programme of professional (radiography) study using PBL and to discover the relationship between communication and learning goals for the group as a whole and for individual students. Ultimately, the study will attempt to illustrate whether PBL is an inclusive learning process in diverse groups. The following research questions are posed:

Research Questions

1. What face-threatening communicative interactions do students encounter in the PBL tutorial?

2. How does a diverse mix of students manage these face-threatening communicative interactions to achieve their learning goals in the PBL tutorial?

3. What is the impact of this communication on group and individual learning?

4. What measures can be taken to support diverse groups of students to communicate effectively in PBL?

Chapter 2: Literature Review

Aim

The purpose of the literature review is to engage in a more detailed and critical analysis of the studies related to PBL. In particular, studies related to groups and group diversity in PBL will be reviewed.

The literature review will begin with an overview of PBL from an historical perspective. This will be followed by an explanation of the term diversity in the context of Higher Education today and how this underpins the study. Finally, the two key concepts of the study, PBL and diversity, will be drawn together with a thorough overview of the research studies which reside at their intersection.

Problem Based Learning

The prevalence of Problem Based Learning

Problem Based Learning (PBL) was first described by Barrows and Tamblyn (1976). Almost thirty years later Kinkade (2005) found that 70% of the 123 medical schools in the USA had utilised PBL on their programmes. Moust et al (2005) reported that PBL had also been adopted by other disciplines such as Health Sciences, Law, Economics, Psychology and the Liberal Arts thus involving 11,000 students and 2500 staff in his own institution (Maastricht) alone. This suggests an acknowledgment of the perceived effectiveness of PBL by those responsible for curricula design. A broad search in ISI Web of Science for PBL as a topic revealed 2,762 articles and 16,360 citations between 1976 and 2010 and a steadily increasing number of publications year-on-year. This demonstrates that the interest in PBL as a learning approach is not waning and that there is, still, a relevant audience for this study.

Theoretical basis of Problem Based Learning

Pioneers of PBL (Barrows and Tamblyn, 1976; Schmidt, 1983; Norman, 1988) referred to the cognitive psychology literature, and learning as information-processing, to support their claims for its success. Schmidt (1993) believed that PBL's roots were in

the philosophies of rationalism and American Functionalism which ally closely to the individualism associated with psychological rather than social explanations of cognition. Early PBL researchers believed that these benefits were realised as a result of: activation of prior knowledge; cognitive elaboration; learning in context; ownership of learning issues; structuring and re-structuring of information; the fostering of intrinsic motivation and co-operative learning (Schmidt, 1983; Norman and Schmidt, 1992; Schmidt, 1993). Within these early descriptions the influence of the group, and the interpersonal skills which may be developed, are secondary to considerations of learning at the intrapersonal psychological level.

Because of the educational theories upon which early researchers believed PBL was based, some authors have expressed discomfort at its claims for success. In two damning articles reviewing the effectiveness of PBL, reported in Academic Medicine, Colliver (2000; 2002) made the following statements:

> *"The author concludes that the ties between educational theory and research (both basic and applied) are loose at best."* (Colliver 2000)

> *"This essay reflects on educational theory, in particular cognitive theory, and concludes that the theory is little more than metaphor, not rigorous, tested, confirmed scientific theory".* (Colliver 2002)

Colliver appears to be making the point that it is the underpinning educational philosophy which is at fault rather than the process of PBL. However, PBL is arguably more effectively described using a Vygotskian constructivist theory. Vygotsky proposed the concept of the Zone of Proximal Development (ZPD) (Vygostsky, 1978) which describes the gap between what the learner is actually capable of, and the Zone of Current Development; what they can only do with assistance. Learning activities should focus on identifying both these states and thus the ZPD that needs to be bridged. Furthermore, Vygotsky specifies that this gap can only be bridged with the help of a 'more capable' peer. Vygotsky's ZPD is also evident in the PBL model. The first five stages (Maastricht 7-jump) require students to identify prior knowledge, i.e. their own Zone of Current Development, and the subsequent learning objectives that are required to bridge the gap. Students return at stage 7 with the results of their own study but it is not until the results of their study are articulated, discussed and

debated that the learning is constructed by the group. In PBL, the 'more capable peer' is in fact the (cumulative understanding of) the group.

A team in New Zealand described their PBL curriculum development using Vygotsky's Zone of Proximal Development (Harland, 2003). In this they emphasise the need to scaffold students providing them with the skills and time to undertake self-diagnostics and they also emphasised the importance of showing them how to become 'more capable peers'.

Other aspects of Vygotskyan theory have resonance with the dialogic elements of PBL required for brainstorming during stages 1-5, and feedback during stage 7, where, following the period of self-directed study and internalisation, students meet up again to reconstruct their learning together. This dialogue is termed semiotic mediation by Vygotsky and is a key feature of his theory as it is where the inter-personal learning takes place. In a group where tools of semiotic mediation are not shared, i.e. as a result of language or culture diversity, then learning in the inter-personal plane may be threatened. This aspect of Vygotskian theory was not considered in Harland's (2003) paper. This is probably because he was working with homogeneous groups in which semiotics are shared, obviating a consideration of such issues.

A constructivist explanation for PBL therefore demands that the 'more capable peer', being crucial to the learning, is included as a factor in studies of effectiveness. Such studies might also include an analysis of the communication strategies that enable the crucial 'inter-personal' learning plane to happen.

Research into PBL

Early research into PBL was concerned with trying to show that it worked as an educational method so that the significant cost implications for setting up PBL programmes could be justified (Svinicki, 2007). The evidence produced proved to be conflicting. A number of meta-analyses and reviews (Albanese and Mitchell, 1993; Vernon and Blake, 1993; Colliver, 2000; Dochy, Segers et al., 2003; Newman, 2004), attempted to make sense of the plethora of research reports but themselves reached conflicting conclusions. Unfortunately, all these reviews excluded qualitative studies from

their analyses. This is perhaps understandable given that, as we have seen, the early explanations of how PBL might work, appear to have been based on psychological and cognitive theories of learning. In this research paradigm, objectivity and quantitative outcomes measures are given precedence over subjectivity of participant experience. Perhaps the scientific discourse, dominant in medical research, also influenced the favoured methodologies of these early studies.

As Bleakley (2006) points out, however, there is a mismatch between the narrow range of research theories and paradigms utilised in medical research and those available within the field of education. He suggests the complex nature of learning in small groups needs to be analysed using theories related to socio-cultural learning frameworks and describes examples such as Activity Theory (Engeström, Launis et al., 2003/4) and Complexity Science. Mennin (2007) also provides a convincing argument for the use of Complexity Science to explain the development and adaptation of the PBL group as a Complex Adaptive System while, as mentioned, Harland (2003) uses Vygotsky's Zone of Proximal Development as a possible theoretical foundation for PBL, and Leung (2002) makes a case for ethnographic observation using discourse analysis.

Perhaps, as a result of such changes in conceptualising PBL, research in the mid-2000's began to embrace new research questions. These have centred around the analysis of the context of the PBL process, including the curriculum and trigger design (2004), the role of the facilitator (Bowman and Hughes, 2005; Van Berkel and Dolmans, 2006; Chauvet and Hofmeyer, 2007) and the function of the student group (detailed in the next section). Controversially, however, much of this research persisted in its use of measurement tools more closely associated with positivist paradigms, however, such as quantitatively-based questionnaires of student experience (McLean, 2004; Visschers-Pleijers, Dolmans et al., 2005; Semerci, 2006). Others, though, have embraced methodologies which are more naturalistic and interpretive including observational studies and discourse and/or conversational analyses (Duek, 2000; Lycke, 2002; Visschers-Pleijers, Dolmans et al., 2006; Clouston, 2007; Singaram, van der Vleuten et al., 2010).

In the next section I will consider the research into PBL *groups* in more detail to highlight the findings and limitations and thus provide a rationale for this piece of work.

Research related to PBL Groups

The value of the group in terms of its impact on learning has been debated. Early PBL researchers believed it existed solely for the elaboration of knowledge to enhance individual learning (Norman, 2001; Eva, 2002). Eva went so far as to say that working together is not success but simply a means to an end that may be effective in some situations, and Norman suggested that the element of group work was an incidental feature of PBL. Barbara Miflin (2004) provided a useful review of the purpose of, and issues associated with the PBL group. Miflin's work was not empirical but a reflective commentary based on the work of others. She concluded that PBL groups should be small (between 6-8), only used during the early stages of a student's journey through a programme, i.e. until they become more self-sufficient in learning, and secondary to learning which she sees as essentially an individualistic activity. Whilst this is an interesting review, it is worth noting that the majority of her sources were themselves commentaries, reviews and secondary sources. Maybe this was because earlier empirical PBL research looking specifically at the group was lacking.

More recently, proponents of sociocultural learning argue for an understanding of PBL which places the group at the centre of the PBL process, the place where learning is constructed. Mennin (2007) believes small group learning is the heart of PBL. He uses Vygotskyan analogies to describe how the boundaries and edges of new knowledge, shared in the group, lead to new understanding. He goes on to suggest that learning is so bound up in the context of the group that different groups studying the same problem will arrive at different learning issues.

It is not surprising, therefore, that much of the research into the PBL group has investigated factors that make an effective PBL group. Some have tackled this from a purely perceptual view, surveying students about their experiences of both good and bad sessions (Virtanen, Kosunen et al., 1999). Others have concentrated on the features of only dysfunctional groups (De Grave, Dolmans et al., 2002; Hendry, Ryan et al., 2003).

Inappropriate behaviours of other students, such as being overly quiet or dominant, or lacking in motivation, appeared to be common findings for these researchers. However, although Hendry, Ryan et al (2003) identified the most disruptive causes of poor group dynamics, these factors in themselves were merely symptom manifestations. They failed to uncover the possible causes of these problems because only survey and questionnaire methods were employed. All these factors, (quiet/dominant students and lateness/absenteeism) for instance, could be attributed to communication failure between individuals who did not hold shared understandings of how students should act in PBL.

Others, though, have attempted to correlate student experiences with outcomes to identify the features of groups which impact on success (Dolmans, Wolfhagen et al., 1998). In Dolman et al's study, students were asked to rate their group against 6 features related to motivational (or social) and cognitive categories and their results were correlated to what the same students thought about their group's overall productivity on a score of 1-10 (6 being classed as a productive group). These authors found that students perceived groups to function more productively if their members were motivated and cohesive, did not 'sponge off' each other or withdraw from the process, and had a high number of interactions and cognitive elaborations. Neiminen and colleagues asked similar questions of students about what made a group effective but correlated findings with a post-study exam as a measure of group outcome (Nieminen, Sauri et al., 2006) and found that there was a correlation between how the students perceived their group to be functioning and the exam results. These studies suggest, therefore, that students appear to be able to distinguish between effective and ineffective PBL groups. However, this finding was contradicted in a study carried out by Tipping, Freeman et al (1995). They also looked at student (and tutor) perspectives of their group team-working and dynamics but used observational studies of the groups in action, as a comparator. The observers were looking for features of team dynamics identified from the behavioural science literature. In their study they showed that there was a mismatch between observations and self-report of the amount of student interaction and the level of reflection and action planning. An important message from this study was that participants *did not* have a realistic awareness of the effectiveness of

their team-working processes and suggests observers remote from the action can offer an alternative perspective.

The conflicting findings presented above might be explained by suggesting that functions which are thought to be indicative of ideal group dynamics, such as the need for equal participation and interaction, and group reflection and planning, may not influence learning outcomes for individual students and a number of more recent studies have attempted to get at what is actually done in a PBL group in terms of how learning is constructed between its members. This work has generally employed observational data collection methods but can be categorised into one of two types in terms of analysis: systematic observation, which Mercer describes as a quantitative assignation of observed talk to previously defined categories (Mercer, 2010), or ethnographic methods which employ socio-pragmatic analytical tools such as discourse analysis.

One group using systematic observation comprised researchers at the Maastricht Institute (Visschers-Pleijers, Dolmans et al., 2006) who aimed to analyse exactly what happens in a PBL feedback session in terms of types and numbers of student interactions. They assigned student utterances into one of 3 broad categories derived from the literature on classroom talk : procedural; irrelevant off-task; and learning oriented. The latter of these three categories was subdivided into exploratory questioning, cumulative reasoning and handling conflicts, based on Mercer's work analysing the classroom talk of children (Mercer, 1996). Cumulative reasoning was defined as more superficial than exploratory questioning entailing consensus rather than challenge. The majority (80%) of interactions were learning oriented. Sixty three per cent of these were cumulative reasoning. Ten per cent were exploratory questioning and only 7% handling conflicts. Of note was the fact that cumulative reasoning dominated the interactions and authors suggested that this was due to the fact data was collected during a feedback session (stage 7) where students were relating their independent study to one another and confirming similar findings. Also, 'handling conflicts', in addition to being infrequent, did not tend to occur until 20 minutes into the session. They suggest this might be because, in light of the highly structured PBL process and the limited discussion time, students learn to reach a consensus quickly. However, it may also be that students feel

uncomfortable with managing disagreement. A more detailed discourse analysis, for example looking at body language or the use of mitigated speech patterns, might have identified instances where disagreement was apparent but not directly aired. Individual interviews with students may also have explained some of these observations.

Furthermore, these students were experienced in PBL (2nd year of PBL curriculum) and had worked together in these groups for 4 weeks. The observation took place over just one session. These are important contextual factors that could influence the types of interactions observed. In other words, how might a group of students new to PBL tackle processes such as 'handling conflict' and 'exploratory questioning' and how might such a group develop over time? It is also interesting to note that in Visschers-Pleijers and Dolmans et al's study, 'off-task' interactions were termed 'irrelevant'. These interactions may be highly relevant in providing important normative referents about how the same students interact outside of the PBL process, which could shed light on changes made to their interactional strategies during learning.

Researchers who have analysed PBL groups using observation but analysed in a more descriptive, ethnographic way are Clouston (2007) and Lycke (2002). Clouston employed discourse analysis (DA) and conversational analysis (CA) to get at different aspects of the communication of a PBL group and to answer different questions. Her paper aimed only to present the methodology for discussion with illustrative references to one group of nine 2nd year students using PBL, and their tutor. Details about the group make-up and the discipline being studied are missing, as are any specific results. However she makes the point that CA could be used to better understand how communicative interactions can lead to a range of cognitive process such as problem-solving sequences, whilst DA can be used to uncover issues of power and identity between members and the interdependence of the group and individual. She provided examples from the transcripts of the observation to support her claims.

Lycke's paper (2002) also aimed to illustrate how re-defining the theoretical and analytical framework from one of cognitive processing to constructivism can shed a different light on observations and interpretations of the PBL group and its interactions. She observed three PBL groups and described the tutor/student identities and roles

according to the 'ideal' as defined in early PBL literature. In one of these groups the facilitator is described as dominating and directing the process going so far as to dictate to the student their learning outcomes.

> *"The students were attentive listeners rather than active contributors. Their own understanding was expressed on cues from the tutor."(p329)*.

This is an ideal approach within a cognitive and individualistic learning framework, however the tutor is not giving the students the opportunity to direct their own learning. Nevertheless, this tutor is also highly popular with the students and much laughter between the tutor and students is observed. Viewed from a sociocultural perspective, the learner is seen as being brought into a community of practice from a peripheral position to a central one by the scaffolding of a more experienced member of the community. In this regard, Lycke argues, the tutor is seen as more enabling in that he has created an environment in which students are more willing to engage.

The analytical tools in these two ethnographically oriented studies are different. This may be because the research questions are likely to have been different (although none were articulated in either paper). What is common is the underpinning philosophical approach which is one of constructivism. This insists learning happens in situ and is created in the unique contexts set up by the learners. For this reason, observational methods of analysing group interactions are shown to be essential, and key to both papers, since contextual variables are difficult to identify after the event and, as Tipping et al (1995) showed, participants can be lacking in perspective in this regard.

What these studies show is that current research into PBL groups now includes more naturalistic approaches based on observation rather than self-reported questionnaires. A number of approaches to analysis have been illustrated: structured observation of types of utterances according to some pre-defined categories which are aimed at understanding the types of interactions that bring about learning (the cognitive goals), and more grounded interpretations of line by line interactions in situ using DA and CA which illuminates the interpersonal relationships (the social goals).

The work of Volet, Summers et al (2009) is interesting as it attempts to produce a model which allows analysis of both these goals independently and in an integrated fashion. Their context comprised students engaged in collaborative learning, which they do not label PBL but is described in much the same way: 6 students working on a clinical case, who had to set their own learning objectives, undertake research and present their findings in a feedback session. The only difference is that this group has no facilitator. Like Lycke (2002) and Clouston (2007), Volet and her team wanted to look at how learning happened in collaboration and they used observational video recordings to analyse this further. They integrated two theoretical frameworks, social regulation and cognitive processing, to code their data into four categories: i) 'co-regulation' which occurred when the group was involved in the interaction as opposed to ii) 'individual regulation' based on one persons input, iii) 'high-level' content processing interactions (included elaboration, interpreting, reasoning, building on or linking ideas, explaining in one's own words or help-seeking for understanding), and iv) 'low-level' processing (including clarification of basic facts and reading verbatim). Thus there were four quadrants into which an utterance could fall. This model was used to analyse three groups and proved useful for showing that patterns of cognitive interactions were similar across groups and related to the stage of the task whereas social interactions were group-dependent. Volet , Summers et al (2009) suggest the model can be used to investigate under what contextual conditions groups might demonstrate the high level co-regulation interactions which, she argues, are educationally the most desirable.

This mixed method approach is also discussed and advocated by Neil Mercer (2010) in his recent review of methods for analysing talk in classrooms. Mercer was one of the pioneers of this field of research (Mercer, 1996) and, although his work was concerned with school children, his methodologies and analytical frameworks have influenced a number of the above mentioned studies. In his 2010 paper, as well as advocating for sociocultural approaches to discussing talk and the inclusion of quantitative and qualitative elements, he is keen to stress the importance of longitudinal studies to ensure data has temporal resolution. He reminds us that learning does not happen suddenly but that it is a continual, cumulative experience. I found no studies into PBL groups which have followed the group over a period of time to try to understand how the developing

social aspects of the group shape the learning goals. There is therefore a need for such a study to be undertaken.

Research related to diversity and culture in PBL groups

In this work, I am interested in how *diverse* groups of students engage in PBL. Before going on to review the studies carried out in this more focussed area of PBL research, I will present my rationale for considering diversity as a causal variable and thereby provide a definition for the terms 'diversity' and 'culture' relevant to the study.

Defining diversity and culture in the context of this study

Diversity and culture

Cultural diversity is a concept that is not only relevant to people from different nationalities but also to people from the same nationality who live within different social groups and with different understandings of how things are. To explain this further it is necessary to define the term culture. Vladimir Zegarac (2008) defines culture as shared representations of things or concepts. He describes how an everyday object such as a pebble can come to be seen as a cultural object, such as a paperweight, if enough people share and subscribe to this notion. Thus things can become cultural objects through shared meanings. Similarly, the way concepts become discussed and constructed between a group of people will make *that* construction of *that* concept specific to that *group*. It becomes an aspect of that group's culture. So for a group of students who have had different experiences of educational method, for instance, there may not be a shared understanding of the role of the student or tutor and in this regard they will demonstrate cultural diversity. Thus, although, as Zegarac says, the term culture is traditionally associated with an ethnic group or nation, it can also be used to describe the shared values and meanings of a subset of its members such as those from a particular age group, social class, or profession.

The term 'culture' appears in the description of Vysgotsky's learning theories especially his notion of 'cultural mediation' (Vygotsky, 1978) because he believed that there is an intimate link between the minds of human beings and the learning they construct as a

result of existing within their own unique environment. This environment is not a vacuum but a culmination of the ideas and achievements of previous generations. Vygotsky believed that humans need to mediate their actions through the artefacts developed by their predecessors and left as a cultural heritage. Artefacts principally take the form of language but can include other psychological and physical forms such as signs, artwork and maps. There is an implicit assumption then that a shared cultural heritage between individual learners (and learners and the teacher) is more conducive to learning and begs the question, where culture between two interlocutors is not common, is there scope for misunderstanding?

Vygotsky's description of the use of language as a mediation tool was intricately linked with this view of cultural heritage and its role in human development. He believed that, unlike immediate sensations and perceptions, conscious thought requires the use of words. Words and their meanings are intricately linked and are embedded both in the cultural-historical development and establishment of language 'rules' but also in the situation in which they are used.

Thus when a person learns to use language they are engaging with a cultural and historical legacy that has determined what should be said (technical accuracy of word use) and when it is appropriate to say it (subjective assessment of the social context). Such an understanding could only come from an individual's development of cultural and historical competence and so occurs firstly in verbal interactions with others, then on the internal plane through conscious thought.

Vygotsky, therefore, argued for a semantic analysis of language use in the understanding of language as a semiotic tool and its role in learning (Liu and Matthews, 2005).

Diversity and culture related to PBL groups; review of literature

A number of PBL studies have considered the impact of culture and diversity on learning. These tend to fall into three types:

i) consideration of how well PBL itself transfers to 'other' cultures, for example, how its student-centredness fits with the eastern culture's notions of education, by comparing

homogeneous groups of students from non-western racial cultures such as Chinese (Walker, Bridges et al., 1996), Korean (Gwee, 2008) and Arabic (Mpofu, Das et al., 1998), using student self-report questionnaires or focus groups undertaken after the learning event.

Some of the concerns driving this body of literature were that the change from tutor-centred to student-centred learning would be at odds with eastern traditions of education and that eastern students would be reticent to speak in classroom situations. However, in the PBL literature studied, this was not found to be the case and with appropriate support the students were able to cope with these demands. In fact, as Gwee (2008) pointed out, the eastern collectivist culture is conducive with the notion of collaborative learning.

For Gwee, what was more important was that the students should have the skills to be able to express their thoughts verbally. In his investigations into Asian PBL classrooms, where Asian students had to carry out discussions in English (2008), Gwee (2008) found that using a second language halted the flow of discussion. This is not so much an issue of unpredictability of 'other', but of lack of confidence in using the tools by which knowledge is transferred from one learner to another, and re-emphasises the importance of language as a semiotic mediation tool for learning.

Mpofu et al's (1998) work looked at the difference between males and females as her context was PBL in the United Arab Emirates where genders are separated for group work. She noted that females and males expected different things out of the PBL session. Males preferred equal participation between members but females were more interested in being helped to reach learning goals and were less concerned if there was unequal participation in the groups. Mpofu made an interesting observation that students who are used to living in power cultures, such as females living in the Arab states, had no difficulty with dominant group members since they more readily accepted the idea of hierarchy. It would appear, then, that groups which are homogeneous can easily accommodate PBL as a method since the characteristics of such groups reflect the features of the larger national traits. All

students have a shared cultural heritage. Individual personalities notwithstanding, they know what to expect from each other, and there are no issues of unpredictability based on cultural difference in communication.

ii) analysing differential experiences of students working in inhomogeneous groups using student self-report questionnaires or focus groups (Treloar, McCall et al., 2000; McLean, 2004; McLean, Van Wyk et al., 2006; Singaram, Dolmans et al., 2008; Singaram, van der Vleuten et al., 2010)

Globalisation and the influx of international students has resulted in diverse learning groups which has been the driver for some of this work, the outcome of which has shown that international students appear to struggle with social integration. For example, in her focus group analysis looking at Australian and South East Asian students working in mixed groups, Treloar (2000) found the international (non-indigenous) South East Asian students lacked a sense of 'belongingness' and needed support to find confidence to participate.

Political changes within countries such as South Africa, which have enabled a wider group of its population to access HE, have spurred a body of literature about diverse learning groups from, for example, the Nelson Mandela School of Medicine at the University of KwaZulu-Natal in South Africa by McLean (2006) and Singaram (2008, 2010). These researchers were interested in finding out not only if PBL could work in diverse classrooms but also whether it could promote social cohesion outside the classroom. McLean's findings (2006) and Singaram's earlier study (2008) appeared positive. They used questionnaires to collect information about students' experiences. McLean showed that,

> *"For almost 94% of students, the small-group tutorial provided a conducive learning environment that influenced their personal development (i.e. tolerance, patience) and socialization into the faculty" (McLean 2006, abstract).*

In particular, mature students reported benefits in this regard. Singaram's 2006 study showed that 80% of 224 students surveyed said they learned to work together

successfully with students from other groups. However, his later study (2010) was more critical.

In this more qualitative piece of work he conducted focus group interviews with staff and 2nd year students together. These were taped and transcribed so that they could be analysed using a Grounded Theory approach. This was carried out by two analysts. The findings showed a picture of optimistic expectations on the part of the students which unfortunately were not met. For instance, students felt PBL provided opportunities to mix with students they would not normally mix with but generally this only happened in the learning group and relationships were not sustained. There was still segregation on the grounds of race outside the tutorials.

In addition, students reported that, whilst there were opportunities to learn from others with different levels of knowledge and skills, which they hoped would be motivating, there were some perceptions of power and dominance in the discussion group. Students who perceived themselves as less able or less powerful, therefore, failed to participate. Tutors were not able or willing to cope with the issues related to power and race. Tutors also felt the wide range of previous educational background meant that the more advanced students became frustrated.

There were some limitations in Singaram's 2010 study however, the main one being that using focus group interviews meant some students might have been afraid to voice their true feelings, especially with regard to sensitive issues related to power. This would have been exacerbated by the presence of the PBL tutors in the same focus group. The study would therefore have benefited from individual student interviews to enable them to speak more freely. Observational work may also have been used to support the findings and to throw light on how complex relationships between students of different races impact on learning. These issues underpinned the methodologies for the next group of studies.

iii) analysis of how diverse groups of students interact through observational analysis of groups in action (Duek, 2000; Woodward-Kronn and Remedios, 2007).

Through a systematic observation, Duek (2000) looked at patterns of student participation in PBL groups at the University College of Los Angeles (UCLA) school of Medicine. She was particularly interested in whether equality of participation for women, "people of colour", and those with English as a second language was evident and she looked to see if these differed with and without a tutor. Despite some issues of sample distribution across the groups, Duek's naturalistic contextual and data collection methods provided some useful insight into what happens in diverse groups.

She showed that, across the three groups studied, when a tutor was absent there was no difference in turn taking (defined as ranging from a single utterance to an extensive discourse) between the students, based on gender but slightly fewer turns were taken by black females and Asian and Hispanic males. When a tutor was present however, group participation was dominated by white males in all groups, and females reduced their number of 'turns' by almost 50%. Her explanations for this behaviour, based on student interviews, included the preference for females and Asian males to take a more peripheral role in the presence of dominant others and this supports Mpofu's findings reported above (Mpofu, Das et al., 1998). She also suggested that students who come from a more traditional educational background, where they were considered a passive recipient of knowledge, were less willing to speak out in PBL. Finally, she suggested that motivational factors related to performance goals rather than mastery goals appeared to be more prevalent in white males when a tutor was present. Duek also makes the observation that, with regard to ethnicity, students in the majority ethnic group (white), dominated discussions.

One of the problems with Duek's study was the underpinning assumption that equality of participation, in terms of number of turns at talking, was an important measure of equality of outcome. There is little research to demonstrate that equal

student participation in PBL is necessary for success, either of the group or the individual student, so while the study provided a rich ethnographic description of the social interactions in these PBL groups, the impact on learning process and/or outcome is not clear.

In addition, her study consisted of a cross-sectional approach. A longitudinal study may have been able to provide information about the development of these power struggles (Mercer, 2010). Furthermore, student age and educational background were not explored in this study.

Woodward-Kron and Remedios (2007) observed a group of 10, culturally and linguistically diverse, physiotherapy students during a 50 minute PBL tutorial in an Australian university. They called their work a discourse analysis and, although the analytical and coding framework was not clear, they demonstrated different communication strategies between students from different cultural and linguistic groups. They showed that Australian students dominated the session in terms of number of interactions. They suggested the failure of non-Australian students to interact went beyond language differences and was related to cultural features, recommending that students from Asian backgrounds should be provided with skills and communication strategies to enable them to gain and hold the floor. They concluded that,

> *"More research is needed to understand possible contributing cultural factors such as different perceptions of critical analysis and critical thinking for the effective contribution of all students in culturally diverse PBL classrooms"* (Woodward-Kronn and Remedios, 2007 p9.16).

Summary

In summary, if, as has been argued, PBL can be described with reference to the theories of sociocultural constructivist learning, then the sociocultural dimension, which resides in the group, must be an important feature for research and evaluation.

This literature review has presented the body of work that exists regarding analysis of PBL groups both homogeneous and diverse. The work can be broadly divided into two

groups: those studies that have considered cognitive processes; the way that learning is created in interaction, and studies which have looked at the social processes; the way that the social interactions themselves facilitate or hinder participation in general or, as in the cultural studies of diversity, for individuals in the group. Some studies looked at both social and cognitive constructs but only the study by Volet, Summers et al (2009) attempted to look at how both were interdependent.

Research methodologies used can also be split into two broad types, quantitative and qualitative. Most studies which used quantitative measures considered the reported experiences of the participants using questionnaires, although some quantitative studies also used systematic observation looking at learning in action, categorising cognitive processes in an attempt to understand how elements of the PBL process were interconnected. Studies using qualitative measures tended to employ focus groups or open questionnaires to get at student experience whilst Clouston (2007) Woodward-Kron and Remedios (2007) analysed observational data using linguistic approaches to understand the social dimension of PBL groups.

Nearly all the studies reviewed collected data at one single episode in the learning activity in an attempt to capture students' thoughts about their learning. It is suggested that a cross-sectional approach such as this would not enable an analysis of group development over time and the impact on learning. Even though, for some studies this single collection period was at the end of the experience, so enabled students to reflect holistically on their experiences, these studies only collected student *opinions* about the group. Whilst this is a valid approach, as Tipping et al (1995) showed, this may not necessarily yield a comprehensive and reliable picture.

What appears to be missing from the body of literature is a study that considers the context of (sub)cultural diversity that exists in classrooms in the UK. The changing profile of students applying to UK programmes of study, particularly programmes of Professions Allied to Medicine, suggests there is a need to understand the impact of diversity on learning for such groups. Lessons from the South African and Australian studies detailed above suggest there is the potential for problems in these contexts. Furthermore there is a need to study disciplines other than medicine. As Hmelo-Silver points out, there is little

research work done on PBL groups outside this discipline which, arguably, attracts the more academically 'gifted' students (Hmelo-Silver, 2004). Understanding how non-medical students construct learning may shed new light on the current research.

An ideal methodology for understanding the influence of the PBL group on learning would build on Volet's attempts to integrate analysis of social and cognitive concepts. However, this would need to be complemented with linguistic approaches, as illustrated by Clouston and Woodward-Kron, to provide a rich ethnographic description of interactions which is missing from Volet's work. Data would need to be collected over a period of time so that temporal resolution would enable changes in context as a result of changing group dynamics to be considered. In order to provide an emic perspective, the students' views would also need to be considered at various stages in the development of the group. Individual interviews would be important so that issues of power would not inhibit expression of views.

These suggestions have been embedded in the methodology for the current study and will be described in more detail in the next chapter.

Chapter 3: Methodology

Introduction

When conducting research there are a number of important decisions to be made which are inter-related. First the researcher needs to decide what sort of thing it is they are doing which, in turn, is determined by the research questions. Secondly, they need to select a research approach which is most likely to yield answers to those sorts of questions. Some approaches, for instance hypothetico-deductive experimental types, specify that every aspect of the research design is determined before data collection starts, whereas research which intends to explore a little known subject where hypotheses are not pre-constructed allow a freer, non-linear approach(Creswell, 2009). Thirdly, the data must then be collected. Some research approaches allow the use of a wide range of data collection methods and tools but again depending on the research question, the most appropriate tool must be selected. Finally, once the data is collected it needs to be analysed. For quantitative research analysis this is usually achieved by the application on appropriate statistical test. For qualitative data the researcher needs to decide what analytical framework they intend to use. They may also need to consider the interpretive framework that will be used to describe to the reader what they have seen and how and why they believe this to be the case, i.e. the discourse they will use to frame the report. The following list classifies this research study in these terms:

Research questions: Exploratory, seeking to understand relationships between social and learning goals

Research approach: Grounded Theory to provide a systematic structure to managing and classifying data

Data collection: Observational videos, focus groups, interviews, other ethnographic data related to the group

*Interpretive framework: Rapport Management

*Data analysis methods: Linguistic analysis, thematic analysis, quantification of interactions

These decisions were made after data was initially interrogated using open coding in keeping with the grounded nature of the study

The following chapter will explain the choices made for this study under the headings listed above.

Research questions and epistemological approach

Coherent research requires synthesis of ontology (ways of seeing the work), epistemology (ways of coming to know the world), and methodology (ways of measuring the world) (Morse and Field, 1996).

There are two broad research epistemologies; interpretivism and positivism (Pring, 2000). Positivism, is generally served by a scientific, experimental methodology which strives to validate knowledge induced empirically, as being that which can be measured or quantified. Interpretivism, on the other hand, suits the relativist researcher who, acknowledging that there is no one universal reality that exists independent of the observer or the observed, searches for meaning and value, concepts measured in rich qualitative description, as their goal.

Using Vygotskian terminology, individual researchers might also be said to be influenced by social, historical and cultural contexts in making decisions about their research epistomolgy. A historical review of research paradigms (Easthope, 1974) shows how both positivism and interpretevism have in turn become fashionable and fallen out of fashion reflecting the philosophy at any one particular time. This has been alluded to in the literature review on PBL in chapter 2, which showed that earlier research, such as that reported in the meta-analysis by Vernon and Blake (1993), gave more credence to positivist approaches . The choice of which of these two epistemological approaches should be adopted in an investigation is therefore often shaped by current trends in science and philosophy (Hughes and Sharrock, 1997).

Others argue for a more pragmatic approach to the decisions made about research epistemology (Creswell, 2009). These decisions should be based on the type of research questions being asked. Questions which are broad, such as those that ask *how* and *what*, suggest interpretive or qualitative research is required. Questions which are more defined and include words such as '*why*' or '*how many',* suggest cause-and-effect, so positivist research is more appropriate. These are more likely to be answered with

quantitative methodologies (Creswell 2009). Creswell (2009)and Burke Johnson and Onwuegbuzie (2004) go on to suggest that more recently there has been an acceptance that both qualitative and quantitative designs can sit together within one research study providing complimentary perspectives in investigations. There is some discussion as to whether these complimentary approaches should be used to 'triangulate' data in an attempt to get at what is the 'truth' whereas Silverman (2006) argues that this is to apply positivistic concerns of validity and is inappropriate. He therefore suggests triangulation is not the purpose of mixed methods approaches. The alternative perspectives should stand on their own to provide multiple views from different participants or observers and in different contexts, which should not necessarily be integrated into one final truth (Silverman, 2006). This is exemplified in Tipping's work (Tipping, Freeman et al., 1995) where student experience of PBL group dynamics was at odds with those of the observers. Retaining this data as two separate perspectives, rather than attempting to come to a conclusion that PBL teamwork was good or bad, enabled Tipping to arrive at the conclusion that students and tutors needed more awareness of what teamwork was and how to identify good and poor dynamics.

I favoured this final, more pragmatic approach in deciding how to research a developing culture in a diverse PBL group. My decision to use an interpretivist approach was therefore based on the type of research aim and questions. The type of words included in my research questions were *how* and *what*. As Creswell (2009) points out, these are qualitative questions. My research aims were about explorations and discovery. There were no pre-assumptions and as my literature review has highlighted, little is known about these sorts of students in this sort of context. The aim of the study was not to look for causal relationships or to control for variables as is the way in experimental scientific methods but to explore, describe and interpret human relationships within the setting of naturally occurring variables. The setting would be specific to one particular group of students made up of unique individuals and as such this research would not attempt to generalise to other settings although it was hoped that in characterising the research setting I might uncover influencing and shaping factors (Baptiste, 2001) that others might consider relevant or at least worthy of further exploration within their own practices.

Interpretivism is therefore the overarching research epistemology which employs a qualitative approach. However there are a number of qualitative approaches. Some of these are fairly fluid, such as heuristical approaches (Moustakas, 1990) whereas others are more systematic in the way the data is handled. One such approach is Grounded Theory (GT) (Glaser and Strauss, 1967).

Research approach: Grounded Theory

I chose GT as a methodological approach to collection and handling data. This is because it not only grants the researcher the flexibility to adapt data collection and analysis as themes begin to emerge, but it also provides a structured method of managing the data and creating an argument which appealed to my personal preference for ordered thought. It is also an accepted approach for naturalistic studies (Silverman, 2006; Creswell, 2009; Wolcott, 2009). Silverman states that GT "has become by far the most influential approach to methodology in ethnographic work" (p95).

In the 1920's, a number of research methods were developed in an attempt to investigate the personal or subjective element of the social world. One example was the work of the Chicago school of sociology which concentrated on theories generated from life stories and cases of people and the societies in which they lived. Such work went out of fashion in the late 1930s due to criticisms regarding lack of rigour and theoretical interpretation. However, interest in theory generation through the GT method re-emerged in 1967 through the seminal work of Glaser and Strauss (Glaser and Strauss, 1967).

Cutcliffe (2000) explains that the principles of GT relate to ridding the researcher of pre-conceived ideas. There is therefore no literature review, at least in the initial stages and no induction of a research hypothesis. As data is collected it is coded so that subsequent sampling and data collection can be refined to investigate emerging substantive and theoretical codes from the initial data which then guide further data sources including, for instance, interview data, observational studies and statistical records. Thus the process of data collection is controlled by the emergent theory and continues until nothing new is found about the concepts being explored and the researcher has, through

a process of memo-ing, and relating emerging theories across data sets, arrived at the basic social problem and process (Morse and Field, 1996).

In order to identify theories, Glaser and Strauss (1967) claim that the researcher must be theoretically sensitive which requires them to strike a balance between a knowledge of pre-existing theories which 'fit' the context and an unbiased approach eliminating 'pet theories' and pre-conceived ideas about the context. Other authors have argued that this is difficult but that the researcher should at least acknowledge their prior and tacit knowledge and beliefs in the report (Geertz, 1990). For this reason I have produced a reflexive account, outlining how my beliefs, attitudes, knowledge and skills may have influenced the study. The full account and can be found in Appendix 3. I have chosen to place this in an appendix because I felt it was important to let the students' voice dominate the main text. Nevertheless, I have attempted to retain my presence throughout through use of first person narrative and, where appropriate, reference to my influence in the research. (For instance see the next section on data collection and analysis).

Specific method of generating theory from the data

In conducting grounded theory, the researcher moves through four broad analytical stages, while all the time, via a process called theoretical sampling, is prepared to return to the field to collect more relevant data (Glaser and Strauss, 1967). The analytical, theory generation process is described by Strauss and Corbin (1990) as follows:

- Stage 1: Open coding where the researcher assigns the data to any number of unrelated categories in an attempt to examine, compare and conceptualise the data. The researcher makes notes or memos comparing each incident or unit of analysis to see if it fits within one of the emerging codes or if it needs a new node category.
- Stage 2: Literature review of the theories used to better understand the phenomena and guide further data collection if relevant, referred to as theoretical sampling.

- Stage 3: Axial Coding where the researcher begins to group codes with commonality so they are subsumed into larger conceptual categories. Conversely, those with a large number of data items might be broken down where appropriate, to identify conflicting and complementary sub-categories. At this point, the researcher also returns to the literature to support their interpretation of the emerging themes and memos are kept to justify decisions made. Relationships between and across these resultant codes are then proposed to produce axial codes.

- Stage 4: Selective coding, where a core category or phenomenon is established to which all categories identified at the axial coding stage, are related. The relationship of these other categories is such that they construct an argument around the core phenomenon. In other words, codes or categories developed at the axial coding stage are not merely hierarchical categories of the original codes but are concepts that can be logically linked together to describe the subject under study in relation to the core category or central idea. These categories are named: contextual conditions, causal conditions, strategies and consequences (Moghaddam, 2006). Straus and Corbin's (1990) definition for these categories are :

    i) *Contextual conditions* : "represents the specific set of conditions within which the action/interactional strategies are taken"

    ii) *Causal conditions*: "events, incidents, happenings that lead to the occurrence or development of a phenomenon"

    iii) *Strategies*: "strategies devised to manage, handle, carry out, respond to a phenomenon under a specific set of perceived conditions"

    iv) *Consequences*: "outcomes or results of action and interaction"

According to Moghaddam (2006), an argument is constructed from the categories such that "The causal conditions affect the core category, the core category and the contextual conditions affect the strategies, and the strategies affect the consequences".

I have used this framework to make sense of the data and also report back the results in chapter 4. Stage four of the GT framework has been used to structure the conclusion of this thesis.

Methods of Data Collection

GT allows for a wide range of data types to be incorporated into the study. Data collection is influenced by the emerging issues. However there are inevitably some decisions made up front in order to collect the initial data sets. The earlier review of PBL literature provided some guiding principles to inform these decisions, (see concluding summary to chapter 2). These were:

1. data to be collected which enables an analysis of the integration of social and cognitive concepts,
2. observational approach to enable a rich ethnographic description of interactions.
3. data collected over a period of time because such temporal resolution would enable changes in context, as a result of changing group dynamics, to be considered.
4. an emic perspective, with students' views at various stages in the development of the group
5. individual interviews so that students would not be inhibited if their opinion differed from the rest of the group

These elements have therefore all been incorporated into the current study design.

Players

Before discussing the study design and data collection methods, I will provide some details about the people in the study context, i.e. myself as researcher and tutor, and the students.

If I was to understand the nuances of the conversations I intended to analyse I had to understand the subject discipline being talked about by the students. The researcher's emic (Fetterman, 1998), interpretations of interactions are said to be more accurate than

etic views as these are based on an informed understanding of the rules governing the relations between those being studied (van Veggel, 1995; Jones, 2000; Pring, 2000). However, there are problems with this. In performing dual roles of researcher and tutor I could be threatening the validity of the study. I would like to consider these issues in the following short reflexive overview.

Potential factors that might impact on the study relate to: i) my position as a tutor on the programme of study; ii) my pastoral role as year manager; iii) my prior knowledge of and bias towards PBL; iv) the cultures which have influenced my own identity and my own RM strategy; (this tends towards being rapport-enhancing through mitigation of an underpinning negative politeness orientation), my white, working class, up-bringing being influenced by authoritarianism and hierarchy v) my limited, but developing, experience of conducting qualitative research.

Because I was the interviewer and also the personal tutor for these students, factors (i) and (ii) were likely to influence the honesty with which students would report their experiences to me. It is suggested by Spencer Oatey (2008) that tutors have a strong power base from the perception of the students, for instance related to their ability to impact on the students' success. Students in this study may therefore have felt inhibited in talking negatively about themselves, their group, other individuals, and their experiences of PBL for fear of being judged negatively by me. For this reason, it was important to also observe students in action and to compare what the students reported to me, in their interviews, with the observational data. If there was a mismatch, a critical explanation of this, with reference to the power issues mentioned above, would be required. However, this is also problematic because observational data is not objective. It is interpreted through me as the observer and analyst and this is where factors (iii), (iv) and (v) are influential. For instance, I would need to be careful not to interpret as rude, a communicative strategy which is more direct than my own, thereby judging the students from my own cultural frame of reference. To counter this, it would be important to illustrate how an interaction was interpreted by the hearer(s) and highlight the resultant impact that interpretation had had on the interactional goal. Therefore my own frame of

reference had to be subordinated to the multiple frames presented by the diverse perspective of students in the group.

Notwithstanding the difficulties detailed above regarding tutor as researcher, the group was purposefully sampled from students studying on a programme of Diagnostic Radiography in which I was employed, because I believed the benefits of an insider's view of the programme would outweigh the potential for researcher contamination of the field and interpretive bias.

The research aim was to describe interactions amongst strangers who were developing their relationships to enable co-construction of knowledge within a new discipline. I therefore chose to study first year students as they would be new to each other, to the discipline of radiography and to the process of PBL

In the cohort population, there were five groups of students I could have studied. Each had been configured for their PBL learning, prior to the sampling of the study group, in accordance with the principles the academic team had developed over the years. These were based on a tacit belief that diverse groups of students would bring a richer perspective to the learning experience for the benefit of all students in the group. All five groups therefore contained students from a range of ethnic backgrounds (although white British predominated in the cohort – approximately 70% in total), both males and females (the cohort was made up of approximately 75% females) and a range of ages (the whole cohort making up approximately 70% of mature students). Figure 1 illustrates the cohort and sample demographics.

	Cohort Demographics	Study Group Demographics
Number of students	54	11
Age range	18-57	18-57
Gender	M = 17, F = 37	M = 5, F = 6
Educational backgrounds	A wide range of educational backgrounds	A wide range of educational backgrounds (see text for details)
Ethnic background	White British (37) , White Irish (1), Black African (4), Asian/Asian British Indian (3), Asian/Asian British Pakistani (3), Asian/Asian British Bangladeshi (2), Chinese (2), White & Asian (1), unknown (1)	Pakistani (1), Mauritian (1)[1], Korean (1)[2], Chinese (1) White British (7)

Figure 1 Comparison of demographics: cohort and study group

The intention was to study one group in detail in order to provide a thick description of its development and practices rather than to compare several groups in more superficial manner. Clearly, generalisations can not be transferred from one such group, but that was not the aim of this study.

I explained the aims of the study to all groups and asked for students to consent to participate. In only one group did all students, and the facilitator, consent to being videoed for the period of the study so this became the study group. As the students in each group did not know each other at this stage there was no possibility of inherent relationship problems influencing which students consented and which did not. The aim of the study was to embrace all contextual issues therefore any of the five groups would have been suitable for study, thus such self-selection and non-selection would not introduce bias. Details about observation method are provided next.

Observational data

Observational video data was used to enable a detailed analysis including linguistic features and quantification of cognitive processes (described in more detail in the data analysis section next). As Kasper points out interviews "cannot substitute recorded observation if the investigative goal is to establish pragmatic practices"(Kasper, 2008 p297). The use of video also enabled clarification of who the speaker was and enabled non-verbal communication to be analysed. Furthermore, the video could be replayed indefinitely to ensure all subtle nuances could be detected which might have been missed in a single, real-life observation, thus adding validity to the results.

Observations were made over the full lifespan of the group from October 2007 to April 2008. Ten PBL sessions were videoed in total but these were not all equally spread due to clinical placement, assessment and holiday blocks that were interspersed at various intervals. A diagram which illustrates the relationship between the data collection points and the students' attendance pattern is provided in figure 2 (page 53). Video recordings were made using a camcorder on a tripod that was situated in the corner of the PBL

tutorial room. A photograph of the PBL set-up and the angle of the camera can be found in Appendix 4.

Interview data

Semi-structured interviews were conducted within the first few weeks of the study to supplement observational data and enable emic perspectives to be aired. Questions asked related to: the students' experiences of PBL as a learning method; the group; and their role in the group.

Gillham (2000) claims that the semi-structured interview is the most important way of conducting a research interview. This perhaps is a broad claim which would no doubt be disputed by ethnographers favouring unstructured interviews who seek to allow the respondent to guide the interview through narrative (see for example Spradley, 1979; Lofland and Lofland, 1995). However, the advantages of the semi-structured interview as outlined by Gillham are attractive for the purposes of this study. These include the ability to compare responses from a number of students with different experiences of PBL against the same questions. In contrast to structured interviews, however, semi-structured approaches allow the use of open questions, so the interviewees can still respond in more depth and permit the use of prompts to search for explanations. Interviews thus served a number of functions such as providing data through which to explore the key issues for further analysis and providing some guidance in the interpretation of the data (Kasper, 2008). They also provided a useful canvas against which to compare and discuss conflicting observational data (Silverman, 2006).

A semi-structured interview, by definition, should be structured in the same way with the same questions for each interviewee. There is therefore a requirement to plan the questions and devise an interview schedule beforehand. Gillham (2005) suggests that questions should be clear, focussed and seek to uncover different responses for each question. Both Gillham (2005) and Lofland & Lofland (1995) propose compiling lists of questions as they occur spontaneously to the researcher over a period of time, then ordering these into topic. In terms of the wording of the questions, they should be clear, brief (i.e. devoid of unnecessary adjectives) and relate to one issue at a time. The

interview schedules were piloted by two students from a different PBL group to test for interview length, wording, relevance and clarity of question focus, question order and repetition (Gillham, 2005). They also enabled me to test the audio and transcription equipment.

Interviews were initially performed on a one-to-one basis but were also driven by the principles of theoretical sampling. For instance, I decided to include a group interview at the end of the first set of individual interviews to determine whether individuals constructed themselves as the group did. I also decided to conduct a second set of individual interviews to determine if the students' expectations for PBL and the group had been borne out (interview guidance can be found in Appendix 5), and I conducted a final group interview at the end of the second semester to see whether the students' opinions of the group and the PBL process had changed. Schedules for these subsequent interviews were not created as, in keeping with a GT approach they were based on reflecting previous responses back to the students for discussion (Chiovitti and Piran, 2003).

As well as being dictated by theoretical sampling, the interview schedule was also dictated by practical issues of student availability. Nine out of the eleven students were interviewed twice during the period of the study, one student was interviewed once and one student was not interviewed at all individually, although she was present for the first group interview. Four of the students had a third follow-up interview as they entered the second year and had experienced new PBL groups.

All one-to-one interviews were audio-taped. Audio-taping was preferred over video-taping for individual interviews as it was less obtrusive. Also, as there was only one interviewee it was easier to transcribe from audio tape as there was no ambiguity as to who was talking. On one occasion the audio tape failed to work part way through an interview. I completed the interview by making brief notes which I elaborated when the interviewee left the room. The first group interview was video-recorded as this was conducted at the end of a PBL session when the tape was already running. The second group interview was called as an additional meeting at the end of the year to discuss some of my preliminary observations with the group and determine their response.

Video-recording was not used for this session but notes were made and elaborated on after the session.

Transcription

Audio-recordings of interviews were transcribed word for word and without linguistic conventions since these would be subject to a content rather than linguistic analysis. Observational data was also transcribed word for word without linguistic conventions but analysis was enhanced by watching the videos.

Extracts used as illustration in this thesis have been presented using one of two methods: i) for illustrations of interactional data standard conventions for linguistic analysis have been used as originally described by Sacks, Schegloff and Jefferson (1974) so that the reader can appreciate the fine grained detail present at this level of analysis. (These conventions are summarised in Appendix 1). Such illustrations are presented in *normal font*;

ii) for illustrations of content and themes only, i.e. where interactional analysis is not the focus, word for word transcriptions are provided using verbatim subject content but no linguistic transcription conventions. Such illustrations are presented in *italic font*.

Data management

The data was managed and analysed using Nvivo 8 software (QSR International). Screenshot examples of how the software was used to create node trees for open coding can be found in Appendix 6.

Ethics

Ethical approval was granted from the University of Huddersfield Research Degrees Committee and the University Ethics Committee at the institution where the study was conducted. Students and staff provided informed consent to be videoed, and for the analysis of their discussions to be published both in this thesis and more widely. Students' names have been changed and care has been taken to avoid the possibility of matching up real identities and pseudonyms by removing names completely where

reference is made to identifying, demographic detail. Data has been stored on a password protected laptop and an external hard drive containing videos has been locked in a safe.

The students were asked whether they wanted to see the videos and my account of their interactions. It has been argued that such an approach would satisfy ethical considerations in two ways. Firstly it would enable the students to see what was being written about them so that they could be assured they were not being portrayed in a negative way. Secondly, it would allow students to verify that the interpretations I had made of the data were accurate (Morse and Field, 1996; Chiovitti and Piran, 2003) which is an issue of validity and is therefore, indirectly, sound ethical practice. However, this did not happen because the students said they were too embarrassed to see themselves on video. Furthermore, by the time the study was complete, most of the students had either graduated or withdrawn from the programme and it would have been difficult to trace them. The drawbacks of this are discussed in 'limitations' at the end of the thesis.

Learning schedule for group B 2007-2008 with data collection activities highlighted

October 2007

- w/c 1.10.07
  PBL1
  8 ind 1st interviews
- w/c 8.10.07
  PBL2
- w/c 15.10.07
  PBL3
- w/c 22.10.07
  PBL4
  1 individual 1st interview
- w/c 29 10.07
  PBL5

November 2007

- w/c 5.11.07
  Students have clinical induction
- w/c 12.11.07
  PBL6
  1 ind 1st interview
- w/c 19.11.07
  PBL7
- w/c 26.11.07
  PBL8
  1st focus group
  8 ind 2nd interviews

December 2007

- Assessment block and holiday period

January 2008

- Students in clinical placement

February 2008

- Students in clinical placement
- w/c 25.2.08
  Semester 2
  PBL1

March 2008

- w/c 3.4.08
  PBL2
- w/c 10.3.08
  PBL3
- w/c 17.3.08
  Easter holiday
- w/c 24.3.08
  Easter holiday
- w/c 31.3.08
  Easter holiday

April 2008

- w/c 7.4.08
  PBL4 (identified as PBL9 in data)
- w/c 14.4.08
  PBL5
- w/c 21.4.08
  PBL6
- w/c 28.4.08
  PBL7

May 2008

- w/c 5.5.08
  PBL8
- w/c 12.5.08
  PBL9
- w/c 19.5.08
  PBL10
  2nd focus group
- w/c 26.5.08

Periods of data collection

Ind = individual
w/c = week commencing

May 2009 4 students had a 3rd individual interview

Figure 2 Data collection points and students' learning schedule

Data analysis and Interpretive framework

In order to identify an analytical and interpretive framework that was grounded in the data, the next stage for me was to start to look at the data to identify emerging themes using the structured approach described above for GT. Morse and Field (1996) also acknowledge that rather than using established theory from the outset, qualitative researchers hold it 'in abeyance', suggesting it is referred to when the most appropriate questions about what has been discovered are to be asked and Wolcott agrees citing:

> *"This backward order of things – first you write and then you figure out what you are writing about – may seem odd, or even perverse, but it is, I think, at least most of the time, standard procedure in cultural anthropology"*
>
> *Geertz 2000 in (Wolcott, 2009) p71*

Therefore, I feel it is logical to move on to the results section and to report the initial coding and show how the interpretive framework was grounded in the data. In a departure from traditional thesis layouts I therefore present the first set of results before returning to a discussion about face, politeness and RM as the analytical and interpretive framework.

Chapter 4: Results

This chapter will report the results. In order to help the reader navigate the multiple sections which relate to the stages of GT I begin with a plan or layout of the results section.

Layout of results

The stages below relate to the explicit stages of GT as described in the methodology on pages 43-44.

Stage 1: Open coding

This will report the open coding undertaken following the first pass observation of the data. It will also present qualitative data to explain and justify why the subsequent analytical framework was chosen.

Stage 2: Returning to the literature to inform analytical framework

This will report an overview of the analytical framework chosen. It will define the terms face, politeness and RM and argue their suitability for understanding the relationship between the axial coding categories – i.e. the key concepts for this research.

Stage 3: Axial Coding

This is the main section of the results. It will present the final codes or 'categories' arrived at after manipulating the open codes, described as axial coding, to identify links. A rich description and exploration of each of these categories will then follow thus:

Section i:	Contextual category: unique demands of PBL
Section ii:	Causal category: group diversity, and non-traditional students, and group ethos
Section iii:	Actions: Strategies used to manage communication
Section iv:	Consequences: interactional goals achieved by the group and individuals

Stage 4: Selective coding

Stage 4 of the GT theory generation model requires the research to derive theory by combining the axial codes into a logical argument. This will be presented at the end of the thesis, following the discussion, in the form of a thesis conclusion.

Stage 1: Open coding

The first stage of analysis comprised open thematic coding of; i) interview transcripts (line by line analysis) and ii) notes of repeated viewing of the PBL session and focus group interview videos, as a first pass observation. This produced 24 open codes. The open codes, number of sources from which they were derived and the frequency of references are tabulated in figure 3 in alphabetical order.

Name	Number of Sources	Frequency
Age	18	43
Benefits of PBL related to work	4	5
Changes in participation over time	11	19
Communication skills	22	77
Competition in learning	7	7
Confidence	16	66
Defensive	5	19
Differences between members	7	14
Disagreement	1	4
Discourse of being a radiographer	13	99
External influences	21	55
Face threatening acts	26	221
Opinions about group	14	26
Other's perspective	16	34
Participation unacknowledged	6	28
Personalising concepts	6	30
Positive feedback	1	1
Previous knowledge	23	53
Reflection	2	2
Relying on others	5	5
Repeating/agreeing	10	93
Right and wrong	12	54
Self directed learner	14	30
Sharing	11	17

Figure 3: Open codes, number of sources of origin and frequency of occurrence

At this stage, approximately midway into the first semester and after all the first interviews had been reviewed, the overarching impression was of a group who socialised

little yet were not antagonistic in one another's company. All students appeared comfortable with the way the group communicated and with the group's progress yet all students acknowledged that they were a quiet group who communicated infrequently. One student made the following comment:

"sometimes I'm wary of saying things, which might offend. Not offend in you know, I kind of hold myself back a bit I think whereas normally I'd say any old thing. Because what I was hoping with the brainstorming for example, you say things and then it'll be filtered out whereas everybody wants it perfect first time"

Jay Interview 1

This statement typifies the general impression I had gleaned from the data thus far and presents a number of important issues which directed the subsequent literature search and the analytical framework for the rest of the study:

i) through speaking there is the possibility *one might offend* others

ii) students will hold back unless they have the "correct" answer – i.e. before participating a student will consider how they will be *judged by others*

iii) the preference for this group is not to offend but to *maintain group relations*

These key issues: possibility of offending others, fear of being judged and choices about managing relations in interactions became the guiding concepts for the subsequent search for an appropriate analytical framework.

Furthermore, the same student also acknowledged that,

"I'm trying to engage with other people who I wouldn't normally meet you see on a Friday night. So I'm talking to people you know like, who are quite different to me…"

Jay Interview 1

In this statement the student identifies that social and cultural differences are present. He also implies, through his choice of the term "trying to engage", that these differences impact on group communication in such a way as to require effort. This supports the rationale for the study which was predicated on the assumption that such contextual factors may influence the way the PBL groups would work.

The literature was therefore searched to identify theories of intercultural communication that might explain the choices people make in interactions which are not normal conversations, but are interactions constrained by institutional rules and practices where there is the risk of offending and putting others or oneself in an embarrassing light and

that might be influenced by social and/or cultural differences between interactants. The concepts of face and politeness were explored and this led to the RM framework as an approach to researching inter-cultural communication. This will be discussed in the next sections of the results chapter.

Stage 2: Returning to the literature: theoretical overview and analytical framework

An overview of the analytical framework, RM, and associated concepts of facework and politeness is provided next. Placing this overview here is crucial since it reflects the chronology of the analytical process undertaken in the study and is a reminder that it is intricately associated with the data derived from the study rather than being imposed on the data from the outset.

Face, Politeness and Rapport Management as an analytical framework

The theoretical framework which I have employed was derived from an analysis of the initial data which showed that the group were developing a polite, respectful communicative approach. The concepts of face (Goffman, 1967), facework and politeness (Brown and Levinson, 1978; Watts, 2003) are relevant to these observations. Spencer-Oatey's RM theory (Spencer-Oatey, 2002; Spencer-Oatey, 2008) brings these concepts together within a framework which also allows consideration of the contextual issues of regulation and interactional learning outcomes.

RM provides a framework for a critical analysis of communication strategies which are not always shared and which may break down at crucial 'face-threatening' moments. RM acknowledges social and power distances as possible factors in the determination of interactional strategies and therefore would allow me to uncover differences between student participation in the PBL context as a result of these differences, and the possible resultant impact on the interactional goal. Unlike many other frameworks for the analysis of intercultural interactions, it moves beyond the study of only linguistic components of talk to include what Helen Spencer-Oatey describes as the other "fuzzy categories" or domains of interaction which include: discourse content and structure, participation, stylistic approaches and non-verbal components.

A note on terminology

RM originates from the discipline of linguistics and, in particular, pragmatics which can be defined as the investigation of,

> *"choice of language in social interaction and the effect such a choice has on others"*

According to Thomas (1983), pragmatics can be sub-divided into two branches *pragmalinguistics* and *sociopragmatics*. The first is associated with the words used whereas the second is the study of what is appropriate to say to whom based on a mutual agreement of socially acceptable norms, a feature Thomas calls pragmatic competence. RM has its roots in linguistics and social psychology and therefore addresses both these concerns. Henceforth my use of the terms pragmalinguistics and sociopragmatics will be used according to Thomas's definitions.

The Concept of Face

'Face' as a sociological concept is broadly related to notions such as esteem, regard, worth and dignity and is what is claimed or protected by a person in a communicative act. It was most notably first used in sociological studies by Ervin Goffman (1967). From this work several characteristics of face emerge; i) it relates to what is 'approved' or held in high regard, and ii) it is related to social attributes, so what is approved is not determined by self but by others. Face is therefore both a social and a dynamic concept in that it is constructed in interaction and is associated with a judgement made by others. Unlike identity, face is not a facet of character but can change moment by moment depending on the interactants and the context. From this perspective, it can be seen that what one person considers to be worthy of approbation another may not. This may be dependent on many factors related to both individual and/or wider culturally-held beliefs. Observing how interactants manage issues of face in communication is what underpins pragmalinguistic and sociopragmatic studies of politeness.

Politeness theories as the origin of RM

It is logical to suppose that as cultural norms vary so might what passes as 'appropriate' in speech. In her discussion of politeness in intercultural communication, Sifianou (1992) suggests that communication between people from different sociocultural backgrounds may be compromised because of differences in,

> *"the tacit agreement among native speakers as to which forms are conventionalized, which forms carry what degree and what kind of politeness", (Sifianou 1992 in Nakane, 2006 p1812)*

According to Harris, (2002) although Robin Lakoff was the first to describe linguistic politeness, it was Brown and Levinson who combined the notion politeness for managing face and, in particular face threat. Brown and Levinson (1978) explain that their politeness theories go beyond the study of etiquette and table manners as they are based on the principle that, anthropologically speaking, any group needs to maintain control over aggression internally within their group but also manage the potential for aggression from external threats. In conversation, human beings are constantly balancing these potential threats of aggression. This is because when people interact, there is the potential to threaten the face of the hearer (or speaker). Brown and Levinson call these interactions Face Threatening Acts (FTAs). FTAs are said to impose a face threat to the hearer's sense of face, and speakers use strategies to limit this threat through politeness. It is important to note though that, in communication, both hearer and speaker are said to be at risk of face loss depending on the type of interaction that is in play.

Figure 4 is taken directly from Brown and Levinson's work (Brown and Levinson, 1987 p69) and shows how the politeness strategy is employed. A speaker estimates the degree of face loss that an utterance has the potential to create. The greater the potential for face loss the more likely the speaker will decide not to make the utterance and this is labelled 'don't do the FTA' in the diagram. If the speaker opts to go ahead with the communication, they have further choices to make. They can go 'off record' , by 'hinting', or they can go 'on record' so that it is clear what the goal of the communication is. If the speaker goes 'on record' then there are further choices still. They can communicate their message 'baldly' which is without linguistic redressive action (referred to as linguistic politeness). That is, there will be no additional words or strategies to lessen the blow of the utterance, or they can apply redressive action. Redressive action can take the form of positive or negative politeness. Positive politeness (e.g. being complimentary) serves to increase solidarity between the speaker and listener by reducing the social distance. Brown and Levinson refer to positive politeness as a "*kind of metaphorical extension of intimacy, to imply common ground or sharing of wants*". Negative politeness (e.g apologising) serves to act as a restraint or reduces the imposition on the hearer by addressing their wants to have their freedom of action unhindered. It

involves the type of ritualistic politeness more commonly associated with respectful or 'mannered' behaviour.
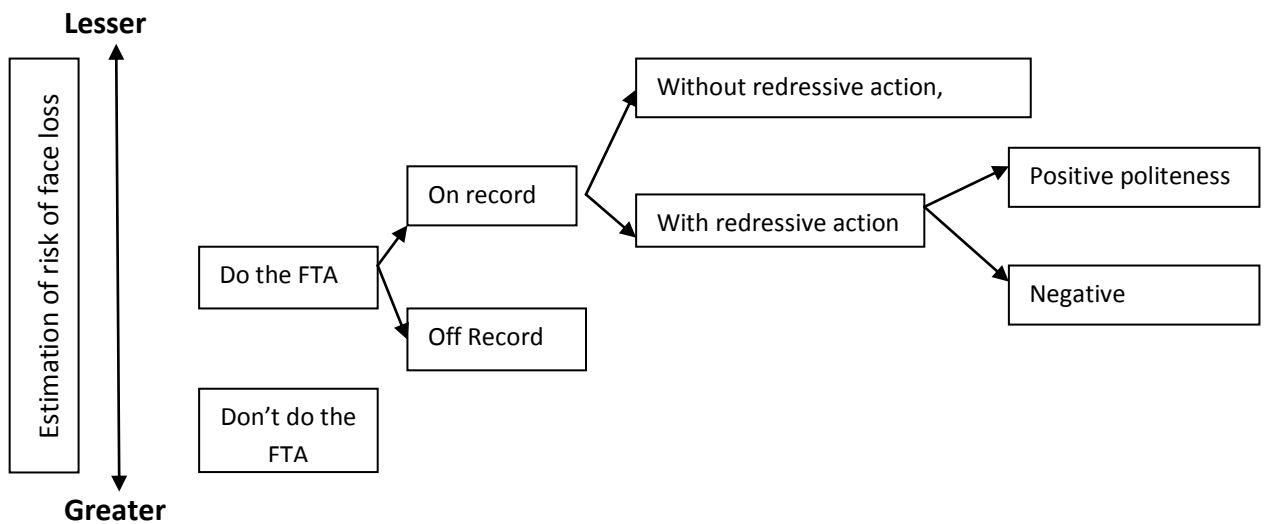
Figure 4: Circumstances determining choice of communicative strategy (Brown and Levinson, 1987 p69)

Politeness theory and the management of face are well-suited to studies of communication between people from diverse backgrounds because of the factors which Brown and Levinson suggest moderate the strategies used. These are: power (p), in other words the difference in perceived status between the interlocutors as a result of, for instance, gender, ethnicity, or age; distance (d) related to the relationship or social distance between the interlocutor; and the rank (r) or weight of the FTA itself, in other words how obtrusive the imposition is. The moderators p and d may be more prevalent in diverse PBL groups than homogeneous groups and therefore ripe for analysis.

One criticism with the Brown and Levinson model is that it relies on an individualistic framework, in other words it analyses how an individual makes repairs to save their or other face. This may not be sufficient for an understanding of how people interact in the presence of others in a group. Brown and Levinson's work was mainly based on communicative interactions between two people. There was little discussion of face threat to individuals addressing groups. It is logical to assume an additional threat to a speakers face might occur in a situation where they are expected to address the rest of the group as in, say, some form of oral presentation. Spencer-Oatey appears to concur that the 'number of participants' is influential in terms of face loss and consequential

communicative choices (Spencer-Oatey, 2008) and that analyses of interactions need to consider collective or group face too.

One of the most recent refinements of the politeness theories has indeed come from Helen Spencer-Oatey (2008). Spencer-Oatey extends the scope of the way politeness is considered, placing it within a broader framework which she terms Rapport Management. She defines RM as relational management that also incorporates the affective issues of interlocutors' wants to ensure "(dis)harmony or smoothness–turbulence in relationships" (Spencer-Oatey, 2007). In other words, it is not just an analysis of how two people manage linguistic structures to uphold one another's face but takes into account context and relationships too.

Spencer-Oatey (Spencer-Oatey, 2002) suggests that in managing our communication with others there are two motivational forces; one concerned with face and the other concerned with sociality rights. She also proposes that each of these has a personal and social dimension as follows:

> Face, as has been described previously relates to one's sense of self-esteem. However, Spencer-Oatey suggests this should be further divided into the personal perspective of face, or the 'quality' face, in other words the desire for others to judge us positively as individuals, whereas the social identity face is the desire we have to have our social roles and positions upheld by others. This distinction is important as the two may be in conflict and/or may be viewed as more or less important by those from different cultures.

> Sociality rights are concerned with our perceived entitlements and obligations in relationships with others; related to being 'considerate'. Like face, this aspect of interaction can be seen from both individual and social perspectives. The individual perspective considers equity in relationships and is related to a mutual understanding that there should be a cost:benefit balance (the degree to which each interactant manages exploitation and benefit in a mutually acceptable way), and an autonomy : Imposition balance (the degree to which demands on another's resources are tolerated). From a social perspective, sociality rights are concerned

with the degree of association or the level of involvement:detachment managed in a relationship. These can be related to interactional association:disassociation (the degree to which we expect general social engagement such as small talk and chit chat or not in interaction) and affective association:disassociation (the degree to which we expect to share feelings and concerns with our interactants).

Spencer-Oatey 's framework also includes the notion of the interactional goal (Spencer-Oatey, 2008); in other words the purpose of the communication. This can be either 'relational', i.e. for the purpose of the development of social relations or 'transactional', i.e. for the purpose of performing a task. By incorporating interactional goals in RM, there is an acknowledgement of the importance of task achievement in maintaining relations since failure to achieve an objective or a mismatch between each interactant's intended goal can cause a breakdown in communication.

Spencer-Oatey goes on to suggest that the choices made by individuals in balancing these communicative concerns are determined by norms or maxims which she terms Sociopragmatic Interactional Principles (SIPs). The suggestion is that SIPs are culturally and contextually bound. For instance, sociality rights might be explicit, in the form of rules, contracts or legal agreements. However, they may also be tacit, relating to, for instance, perceptions of power, social distance and custom. As these tacit features of context are time-bound Spencer-Oatey's model also acknowledges the dynamic nature of communication. She suggests individuals learn to predict the impact of their speech on the hearer as they become acquainted with them. This results in a constant assessment and re-assessment of communication strategy. The RM framework thus lends itself well to the study of the development of a group over time.

Spencer-Oatey (Spencer-Oatey, 2008) believes we manage these face and sociality concerns through not only the pragmalinguistic features of our interaction (the structure of our utterances) but a range of other fuzzy interactional features or domains such as body language, level and quality of participation, discourse choice and style of interaction (e.g. level of formality). She therefore advocates a consideration of these wider sociopragmatic features in the analysis of communication.

In providing this overview of face, politeness and RM I have attempted to demonstrate that these concepts can be usefully applied to study the issues emerging for my study group The purpose of my study is not to add to the theories of communication but to apply the principles developed by sociopragmatists, in particular Spencer-Oatey, to help understand how FTAs are managed in the PBL context by students of differing social and cultural background.

Analytical Tools

In keeping with the use of RM as an analytical framework I wanted to identify first of all the influence of the three bases of rapport: face, sociality rights and obligations and interactional goals, and then how the students' choice of communication strategies influenced, and was influenced by, these bases. In particular, because learning is the primary function of the group, I wanted to see if the communication choice was detrimental to learning of either the group as a whole, or of individual students.

In order to consider the data within the RM framework I have analysed it both discursively through a discourse analysis, and systematically, using descriptive statistics of participation and characterisation of cognitive utterances, as follows:

i) Face
- Thematic analysis of individual and group interview data to identify of what, according to the students, constituted an FTA in PBL.
- Discourse analysis of how these FTAs are managed between interactants
- Descriptive statistics of participation domain features, including silences, to determine whether FTAs were tackled or avoided

ii) Sociality rules, rights and obligations:
- Thematic analysis of individual and group interview data to identify perceptions of sociality rights and obligations
- Discourse analysis of FTAs to determine how sociality rules, rights and obligations are played out in their management

iii) Interactional goals:

- Systematic observation of cognitive level of utterances (defined under stage 3 section iv page 137) and whether these are related to high or low face threat and whether this changes over time.

Transcripts of all video data (all 10 PBL sessions) were analysed to identify the types of learning interactions which were evident across the period of the study for both cognitive and RM features. Learning interactions were considered to be all those interactions in which the students were engaged in a discussion of the topic or the PBL process. It therefore excluded unrelated social interactions, such as those related to and during break periods. From reviewing all 10 PBL sessions a coding scheme was derived. Coding categories were therefore grounded in the data and for this reason will be described further in the results section.

All learning interactions across PBL sessions 2, 4, 5 and 9 were then coded to arrive at a quantification of the interactions. These were selected because sessions 2 and 9 represented the first and last complete PBL sessions and therefore reflected points when the students were least and most familiar with one another. Session 4 was selected because it was the one session when all 11 students were present so it was the only occasion to analyse the group as a whole. In session 5 there was a stand-in facilitator and it would be interesting to note how this contextual change might impact on the group performance.

iv) Communication style and interactional ethos:

- Thematic analysis of individual and group interview data for references to group
- Discourse analysis of interactions for evidence of lower order SIPs and commonalities and differences between students

Types of data

Interview data was therefore analysed for content only, whereas video footage of the group in their PBL tutorials was analysed for both content and linguistic approach using a critical discourse analysis framed around the RM model.

So far in this thesis, then, I have presented two stages of results. Initially came a first pass observation and open coding of the data to identify some key themes about the group. From this emerged an analytical framework from which to proceed. The theories that underpin this analytical framework were presented as stage two of the results. I will now return to the empirical data to present the next stage of results which is the axial coding and detailed presentation of the related categories.

Stage 3: Axial coding

The open codes presented in stage one were manipulated in a process referred to by Strauss and Corbin as axial coding (Strauss and Corbin, 1990). Minor codes were subsumed into larger conceptual categories, and those with a large number of references, were broken down where appropriate to identify conflicting and complementary sub-categories. Memos were kept to justify decisions made at this stage. Examples of memos made during this process can be found in Appendix 7. At this stage of coding, the analytical framework had been identified and its influence is evident in the naming of these categories. The final node grouping was as follows.

Tree Node	Unique FTA demands of PBL
Tree Node	Group diversity
Tree Node	Non-traditional students
Tree Node	Group ethos
Tree Node	Managing Rapport
Tree Node	Interactional learning goals
Tree Node	Impact on individual

Figure 5: Axial codes derived from analysis of open coding and literature related to politeness and RM

'Unique FTA demands of PBL', contained reference to the learning context that appeared to be unique to PBL and which contributed to discussions of the degree of imposition of FTAs. Instances of FTA coded under this node also provided the significant events for discourse analysis. 'Group diversity' and 'non-traditional students' provided context about students making up the study both in terms of what made them different to the 'traditional' HE student and what made them different to one another and this relates to the 'p' (power) and 'd' (social distance) variables that influence communication. 'Group ethos' contained data which illustrated the way the group constructed and developed their identity and 'Managing Rapport' referred to the strategies used to carry out the interactional learning goal. These two codes relate to the construction of the group in action. 'Interactional learning goals' contained information about what cognitive interactions were observed and 'Impact on the individual' code concerned various

outcomes for individual students. These two codes will enable discussion around the outcome of the strategies used by the group.

In keeping with the generation of theory from the data using GT, the codes were attributed to one of four categories, namely: causal conditions, strategies, contextual conditions, and consequences. Figure 6 shows how the axial codes represent each of the four GT categories and how these were linked to form a developing theory for analysis using the RM framework. In the next section, results of each of the categories will be presented in detail.

Theoretical model grounded in the data

Socio-cognitive nature of learning interactions

Unique demands of PBL

Diver-se group

Non-traditional

Emerging group ethos

Rapport Management Strategies observed

Interactional Outcomes (cognitive levels of interaction categorised by face threat)

Group

Individuals

Axial coding category types

Core category

Reported in section i) on page 72

Contextual category

Reported in section ii) on page 83

Causal Category

Reported in section iii) on page 98

Actions

Reported in section iv) on page 137

Consequences

Figure 6: The four Grounded Theory categories, where they are reported and how these are linked to construct an argument for socio-cognitive nature of learning

Section i) Contextual category

Unique interactional demands of PBL

In this section I present data which reconstructs the PBL tutorial and its interactional demands from the perspective of the student. Specifically I will show how the students perceive the interactional functions of the chair, scribe and team member since each of these roles carries a set of associated obligations and rights. As will be seen, for the most part these obligations and rights were constructed by the students as potentially face-threatening. This section therefore also highlights the notion that for these students PBL was associated with FTAs and identifies the sorts of FTAs which were suitable for the subsequent discourse analysis.

Interactional Functions of PBL Roles

In order to undertake PBL, as defined by Schmidt (1983) in the 7-jump model and practised in the study context, a student may be required to fulfil one of three roles: chair, scribe or group member. In these roles, students lead or contribute to the discussion to enable the joint construction of knowledge which is the interactional goal, i.e. in doing PBL. The primary purpose of PBL interactions is therefore functional rather than social. In other words, students interact to engage in learning.

 The following results relate to these interactional functions which students identified as being associated with the roles of chair, scribe and group member.

Interactional functions of the chairperson role

Analysis across all sources of data, where reference was made to chairing, identified four interactions associated with the chair's role, as illustrated in figure 7: i) directing people, ii) following procedure, iii) singling people out for contribution, and iv) summarising the discussion.

Interactional functions of a scribe

There were five interactional functions associated with the role of scribe: i) spelling, ii)

writing legibly, iii) deciding on what aspect of the discussion to capture, iv) deciding how to word the discussion, v) fulfilling other secretarial tasks, such as emailing objectives. These are also illustrated in figure 7.

Interactional functions	Source	Illustration
1. Chair		
Directing people	Ian interview 1	Ian: *"but it's hard to actually erm direct people and lead the group when you don't really have that much knowledge".*
Following procedure	Ian Interview 1	Ian: *"I mean last week we were was just looking round the table at each other and I didn't know where to start to be honest"*
	Marian as chair PBL 2	Marian *"ok (2secs) so do we move on now?"*
Singling out people to contribute	Marian as chair in PBL 2 (in response to request by facilitator for the chair to identify a group member to make a contribution)	Marian: *"do I have to choose (laughs) that's AWFUL ((laughter))"*
	Discussion reflecting on Harry's direct chairing style where he singles out individuals to contribute, Group Interview 1	Pam: *"I'd feel a bit tight doin it myself ((laughter)) I'd be like oh no I don't want to tell you to do that"*
Summarising	Harry reflecting on his role as a chair – interview 2	Harry: *I'm not that good, I don't really summarise anything or stuff*
2. Scribe		
Spelling	Harry as scribe in PBL 5	Harry: *"spelling's not my strong point ((laughs))"*
Writing legibly	Joyce as scribe in PBL 6	Joyce: *"I've got awful handwriting and can't spell so (laughs)"*
Deciding on what degree of detail to capture	Joyce as scribe in PBL 6	Harry: *"what's BP stand for?"* Several students: "*blood pressure*" Joyce: "*shall I write that down*"
Deciding on wording	Laura during her role as scribe PBL session 4	Laura: *"so shall I do it as three different objectives?"…* …"*what shall I write in here? Erm*"
Other secretarial tasks	Ed as chair PBL 1	Ed: *"and Emma was the scribe so erm she kindly emailed us the objectives"*

Figure 7: Interactional functions of chair and scribe

Interactional functions of group members

The role of a group member is to contribute to the discussion to enable the joint construction of knowledge which is the interactional learning goal. There were 10 broad interactional functions identified by students required of group members and these are illustrated in figure 8.

Interactional Functions	Source	Illustration
Lateral thinking/brain-storming	Harry Interview 1	Harry: *"PBL is when you're working within a group trying to think of ideas or solve problems that's been presented to you. The problem's brand new so everyone won't know about it. So you got to knock heads together and think of ideas of what to do"*
Offering and considering alternative ways of understanding	Ed Interview 2	Ed: *"many a time if I'm actually struggling with something, if I don't say something someone else may say something about that and then that would help the way I think about it. Because they're looking at the same problem but from their point of view"*
Disclosing and sharing previous knowledge	Jay Interview 1	Jay: *"some people might be really good at certain aspects and bring that in and we can ask questions and say 'oh, what do you mean that' for example osteoarthritis and they might give like a quick layman's definition to it as well"*
Creating learning objectives	Jay Interview 1	Jay *"because we're producing the objectives ourselves, we're more motivated"*
Contributing to the feedback	Den Interview 1	Den: *"when we gave the feedback, each of us contributed, to a certain extent, of what we have prepared and listened to the others and so on"*
Standing at the front	Joyce Interview 2	Joyce: *"I think what the advantage is going to be that communication, that confidence, that standing up doing a presentation"*
Admitting own ignorance, misunderstanding of subject	Ian PBL 1	Ian: *"if you're having problems with something and you don't understand something you know people wont know unless you say to them or you ask do you understand"*
Sharing understanding	Laura Interview 1	Laura: *"if anyone doesn't understand something other people might understand it and they can share what they understand and then put it in a different way for them so that everyone in the group eventually understands everything"*
Explaining concepts/paraphrasing	Harry Interview 1	Harry: *"The difference is PBL actually gets you to learn stuff and try and explain to other people. So there's more learning"*.
Using new discourses and terminology	Emma Interview 2	Emma: *"Cos like all the lectures obviously they use all the technical stuff but even though you have to keep the technical words in but you can make it in well Layman's terms so it's more like easier for you to understand"*

Figure 8: Interactional functions of group member

Face Threat

Having identified the interactional functions of the chair, scribe and group member roles they can now be described according to the face threat they can potentially pose to the interactants. The threat can be to self, other or group. By analysing how students talked

about the functions (see illustrations in figure 8) it was therefore possible to categorise them accordingly.

Chair

Students reported chairing as potentially face-threatening as illustrated by Ian in his first interview. When asked about his experience of chairing he said,

> *"I didn't want to put them on the spot because they couldn't have said anything to be honest"*
>
> *Ian interview 1*

Ian is suggesting that chairing places him in a position where he is likely to threaten another's face. A general lack of enthusiasm for taking the chair role was also frequently observed in the video data, for example in this following sequence from PBL session 3,

> Ian: erm: (0.2) you're chair this week aren't you, Ed
> (1)
> Ed: am I ((laughter))
> Laura: did you see his face drop then (.) he was like ((pulls a face))
>
> PBL session 3

Scribe

Although students did not volunteer unsolicited negative comments about the role, like chairing, there was evidence that being scribe was not desirable,

> *(facilitator asks who is scribe)*
>
> Other students: Emma's scribe
> Emma: I'm scribe? ((looks at others incredulously then drops head in mock exasperation and sighs, others laugh))
>
> PBL session 3

However, some students did like to scribe and it appeared to be more acceptable to them than chairing as identified by Marian in her second interview,

> *"Oh my God. I was horrified when I came back the next week and I'd forgotten that when you chair one week, you chair the feedback. I was horrified and I thought "oh my God"…It was a bit you know, it's like anything else, I've never done it before. You know, next time round it will be better. I enjoyed being the scribe"*
>
> *Marian interview 2*

Students appeared self-conscious about their skills for scribing suggesting that, unlike the chair role, threat was to own face rather than others.

Group member

Some elements of being a group member were identified by students as face-threatening, and in particular, threatening to own face because of being judged negatively by others.

Of the 10 interactions identified in figure 8, the following 7 were suggested by student comments to be potentially face-threatening:

i) Lateral thinking/brain storming

"sometimes brainstorming is not as interesting as it could be because we're almost like too afraid to say things because of what the other person might think"

Jay Interview 1

ii) Disclosing and sharing previous knowledge

"there are times when the lecturers will be asking certain questions I would rather leave the other students to answer even if I do know I mean I don't know all the answers but I try to leave it so that I feel I am just as one of them, yes"

Den Interview 1

iii) Contributing to the feedback

"you think, 'oh it's my turn, now I've got to say something cause it's my turn cos I haven't said anything yet'"

Joyce interview 2

iv) Standing at the front

"I think it's just that fear of standing in front of the class for me any way cos I'm quite happy to sit here and talk but I wouldn't get up there ((points to front))"

Pam focus group interview 1

v) Admitting ignorance

"it's being able to do that isn't it not thinking you know sitting at home and thinking aw I can't say anything I don't want them to think I'm stupid and you know instead of just coming out with it and asking for help"

Marian PBL session 1

vi) Explaining

"erm weakness in like explaining ideas or knowledge so that's a weakness … I think I'm a ok communicator but I can't really explain idea that's the point"

Harry interview 2

vii) Using new discourses

"no, I can't even pronounce the words they're just horrible"

Pam PBL session 7

Of the remaining three interactions, "creating learning objectives" was not referred to directly as face-threatening. However, there was evidence in the observational videos, from the communication strategies employed, that students felt some discomfort in undertaking this interaction, in particular the silences that ensued at these times (discussed in more detail later). There was no evidence that the remaining interactions, 'sharing understanding' and 'offering and considering alternative ways of understanding' were face-threatening at all. "Sharing understanding" was used most frequently by students and helped to enhance group rapport. This reflects the work of others (Mercer, 1996; Visschers-Pleijers, Dolmans et al., 2006) who showed that 'cumulative reasoning' was the most frequently employed interaction in learning groups.

What has been described uniquely here, is that the student-directed nature of PBL requires participants to engage in a series of potentially face-threatening acts. Unlike other methods of learning, PBL requires the students to pose a threat to others face as well as own. Interactions in PBL are therefore 'weighty' or using Brown and Levinson's terminology the rank of imposition, r, is high.

The strategies used to engage in the face-threatening interactions will be reported in stage 3 section iii of the results chapter.

Other factors influencing the rank of the FTA

PBL as a 'performance'

In addition to talking about roles related to the PBL process, student comments about their engagement with PBL were couched in performance imagery as if they were on stage acting out a role. Each session appeared to be signalled by a clear start and end point as if it were an entity encapsulated by time within the tutorial session, during which students viewed themselves as being 'on-stage' or 'doing PBL',

> " ((to facilitator)) can we start"
>
> *Jay, when chairing session 5*

> "ok thank you very much Marian for chairing" ((student body language is one of relaxing – sighs, yawns, stretches, closing books, Joyce giggles))
>
> *Facilitator ((marking end of first PBL session))*

Script

Student interactions were different between 'on-stage' time and 'off-stage' time. On-stage students made indirect reference to a kind of script. Here, when asked about student responsibilities in PBL, Joyce talks about making sure she knows what she is going to say,

> *"make sure you know that you've really rehearsed what you know and, like you say, not reading out"*
>
> *Joyce Interview 2*

Off-stage, there were few silences, the conversation was 'normal'. Ed says,

> *"Well actually when [the facilitator] goes out or something and I find sometimes I can let my hair down. You know … I can just crack a joke or something and I can be like that, very spontaneous"*
>
> *Ed interview 2*

PBL is designed to be student-directed. However there is a prescribed model to follow similar to a script and a set of roles to act out. This may be prohibiting, in that it provides a script which students are afraid of getting wrong. The demands of PBL with its formal structure and set roles, therefore, make it different to other unscripted tutorial or collaborative learning methods. In keeping with the theatrical analogy, it is understandable that the pressure to produce a good performance may be responsible for stage fright. Students may be more conscious of getting it right where the 'it' not only refers to disciplinary knowledge but also to the process of PBL. As Marion reflects on her role as chair,

> *"yes it was a bit un-nervy that because I wasn't really sure what to do you know, what to say or when to say"*
>
> *Marian interview 1*

Thus this group of students who are all new to the PBL learning experience does not only have to engage in learning but must follow a structured process which dictates how one should behave in this context. This appears to add to the rank of the imposition.

In the presence of 'strangers'

Students expressed concern that the tricky interactional demands of PBL were being made whilst they were in the presence of strangers since this is how they viewed their group at the beginning.

When discussing Strengths, Weaknesses, Opportunities and Threats (SWOT) for the group in the first PBL session Harry said,

"I don't really know my class mates too well so that's probably a threat"

PBL Session 1

Pam explains how this impacts on the learning interactions,

"no like you know the first couple of weeks you could see like everyone was dead quiet and there was loads of deadly silences and stuff"

PBL session 1

Laura linked the concepts of familiarity with others' confidence and communication suggesting that over time communication would increase as a result of confidence gained through interactions,

"I think like as well as we get to know each other everyone's confidence will increase over time ((yeah, hm hm from group)) so you know you'll get the erm people will agree with you and stuff so you'll build your confidence over time being able to speak like you can say anything what you want"

PBL Session 1

The point being made here is that there is a need for the group to be socially at ease with one another to enable each student to have the confidence to engage in the interactional demands of PBL. Students agree this social proximity is not present at the beginning of the PBL sessions. This equates to Brown and Levinson's '*d*' or social distance which they say is directly related to the face threat in interactions. Students also make assumptions that over time they will become socially closer; *d* will diminish. No students expressed concern that social closeness would not develop. However, as we shall see later, this was a false premise.

Group Contract

The group are required to construct a learning contract at the beginning of the semester which sets the behavioural ground rules. This can be equated to the formal rules Spencer-Oatey suggests can underpin sociality rights and obligations. The contract is set in the first PBL session.

The facilitator asked the students why they thought a group contract should be created. Their responses included,

"everyone knows what is expected of them"

"so if someone isn't contributing and stuff we can go to the group contract and make them ((others laugh))"

In terms of obligations, the facilitator asked what they expected the others as group members to do. The responses were,

"contribute"
"exchange ideas"
"to do the research during the week"

The facilitator asked what was meant by participating, how they could participate, and in what ways. The students' responses included,

"well to be involved in the various activities communication and so on … to get involved"
"share our findings"

The facilitator asked how they could reinforce what somebody has just said. The responses were

"encouragement"
"erm reiterate the idea that they've explained to you (nods smiles)"
"you might have experienced something to do with the trigger and be able to share with everybody about it"

As can be seen from these responses regarding the learning contract, which formalises societal obligations, this group considers 'contributing' as important. Ways of contributing are identified as communicating, sharing and encouraging. The group also expects all students to do their independent study work to bring back to the group, which they would then share. Sharing is also associated with previous knowledge and experience.

Of note is the observation that the group does not talk about debating or engaging in critical discussion or handling disagreement, except one student who says,

"you need to be careful about referencing cos if you do have conflicting information you can all go back and look at both things and where you found it and see which was the right one"

Here, she is suggesting that the source of conflict would be related to factual information rather than from opinions, behaviours or attitudes of others. There is therefore no awareness that personal differences of opinion can arise or how these might be handled.

Two students intimate that they need to learn to consider the opinions of others in their communication providing an indirect reference to managing rapport in interaction,

> *"So you know, it's how to deal with people. Not necessarily difficult people, but different types of people and so it's kind of improving your interpersonal skills as well"*
>
> *Jay interview 1*

> *"Cos I used to kind of jump in with ideas and now I kind of like listen and evaluate and then perhaps make a contribution"*
>
> *Ian interview 2*

Consequently, although the students are able to identify their *obligations* there is little reference to sociality *rights*. Indeed the reference to 'making' others contribute infringes rights, although this is handled humorously rather than seriously, as can be seen from the laughter from other group members.

With reference to the learning interactions described by Mercer (1996), and used by others in observing group interactions (Visschers-Pleijers, Dolmans et al., 2006), the obligations identified by the group would appear to prepare them for cumulative reasoning, but not necessarily exploratory questioning or handling conflict. Given the diversity of the group and the likelihood of diverse perspectives, this demonstrates a lack of awareness of the communicative demands of PBL.

This section has therefore described the aspect of the study I classified as the Contextual Category within my GT approach; i.e. PBL. It shows how the students conceptualise PBL as the learning context; the challenges and expectations. From this data we can see that PBL is littered with FTAs as identified by the students themselves. It also highlighted to me the types of interactions on which to focus the analysis of communicative strategy. However, the focus of this study was to analyse whether diversity is causal of communicative difficulty within the context of PBL. Before I could do that, I would need to determine whether the group could be described as diverse. Therefore, the next

section will detail how the students differed demographically and how they were each different to the 'traditional' student of Higher Education and thus the data explored in the next section equates to GT's 'Causal Category'.

Section ii) Causal category

Non-traditional students, group diversity, and group ethos

Introduction to this section

The purpose of this section is to show whether diversity is a cause of complexity requiring a specific communication strategy within the context of PBL. Having detailed the specific features of PBL which students said they found to be face-threatening, it is important to acknowledge that not all students found all interactions difficult. Nor did they find the same functions difficult. In order to explain why this might be I will turn my attention to the characteristics of the study group concentrating first on the individual and then the group as two specific units of analysis. First, I shall highlight the student demographics which can be described as 'under-represented' or 'non-traditional'[1] in higher education, according to national and sector statistics. Then I will present data to show whether, as a result of being different to the norm, students believed they were more or less equipped to engage in the interactional functions of PBL as defined in the previous section.

I will also highlight the demographic differences that existed *between* the students making up the study group to show that the group was 'diverse'. I will then illustrate students' perceptions of these differences to identify whether power and social distance impact on communication based on the way students position themselves, or come to be positioned, in the group.

Finally, I will show how the group ethos developed as a result of the communication strategies chosen and the diversity of the group and how this ethos in turn constructs the

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[1] These terms are both problematic. 'Non-traditional' is time bound in that what was traditional several years ago may no longer be traditional – it is subjective and non-specific. 'Under-represented' is more objective as it has a value qualifier – it can be related to current figures. However, there is also a value judgement here as the word 'under' suggests a critical stance in that this should be corrected. Also, by what measure is 'under' judged and who is making that judgement – should it be pro rata based on national population demographics? To avoid confusion, I will therefore use 'traditional' and 'non-traditional' and refer to current figures in sector/institute/UK HEIs as a comparators.

group and the developing preference for rapport-enhancing, rapport-neutral or rapport-threatening communication strategies (Spencer-Oatey, 2008).

Non-traditional students

This section presents data from interviews, observational studies and demographic data showing how each student can be classed as from a non-traditional group in terms of participation in HE, looking at intrinsic features such as age, gender and educational experience and extrinsic features that might impact on PBL engagement such as external family pressures.

The Higher Education Statistics Agency (HESA, 2010) defines 'under-represented' as groups that are under-represented in higher education relative to the HE population as a whole. Measures of under-representedness are collected by HESA as performance indicators, and characteristics which are captured relate to gender, ethnicity, age and socio-economic factors.

Fixed Demographics

Gender, ethnicity, and age

The table represented in figure 9 shows that the majority of students in the study could be defined as coming from an 'under-represented' group in HE according to national, local and sector statistics. The table also shows that the study cohort is more diverse in terms of ethnicity, gender and age than the national student population as a whole, and the discipline sector more specifically. Furthermore, some of the individuals in the study group are also non-typical of the student population, especially students over 30 and those from ethnic minority groups. This provides evidence that the group can be considered to be non-traditional and inhomogeneous.

	UK Population (Office for National Statistics, 2004)	UK HE 2006/7 cohort (HESA, 2010)	Sector Radiography 2007/8 (Henderson, 2009)	Programme Annual Programme Monitoring Report 2009 (internal document)	Study group (2007) n=11
Ethnicity	Pakistani = 1.8% Chinese = 0.4% Asian (other than Pakistani, Indian or Bangladeshi) = 0.4% White = 92.1%	British/Pakistani = 3.2% Chinese =1.0% Asian other = 1.7% White = 77%	Indian/Pakistani/ Bangladeshi = 5.8% White = 84.9% Other 2.3%	Not available	Br / Pakistani = 9% Chinese = 9% Korean: 9% Mauritian: 9% White = 64%
Gender m/f	Not applicable	41.5%/58.5%	25%/75%	31%/69%	45.5%/54.5%
Age%	Not applicable	<30: =78.2% >30: = 21.5%	<30: = 72% 30-39: =18% 40-49: =10%	>21 = 70%	<30: = 36% 30-39 =27% 40-49: = 18% 50-59: = 18%

Figure 9: Ethnicity (relevant to study group demographics), gender and age for the population as a whole and the HE student population for 2007/8

Figures are % of populations in columns
Ethnic categories provided are those inherent to the study group. Data was not available for 2007/8 from all sources so the year closest to the study had been provided.

Non-fixed demographics

Social background of HE

According to Hansen and Mastekaasa (2006), students whose social background has been influenced by HE may be better prepared emotionally for their role as a self-directed learner resulting in them actively engaging in, for instance, the PBL tutorial setting. Metrics for analysing such factors relate to family association with HE (Smith and Naylor, 2001) and social class. In terms of family history, students were asked directly about this and there was a range of responses from no-one in the family at HE,

> "… I am the first in my family to go to uni. So my mum or dad don't have any experience of it and neither do I, so it's like a new thing"
>
> *Emma interview 1*

to a well-established family and personal history of HE experience,

> " I have been to universities before and obviously I have a number of friends and relations. My daughter, she's been to university. So in a way I wouldn't say 100%, I'd say about 50 – 60% of my social circle are within this sort of academic study, yes"
>
> *Den interview 1*

Postcode analysis, using the 2007 Indices for Super Output Areas (ONS, 2008), suggests that the students in this group resided in a wide range of neighbourhoods in terms of the prevalence of participation in HE. One student came from a neighbourhood where the participation rate was 15%, which represented the lowest for the group. One student came from a neighbourhood with 58.4% participation, which was the highest represented in the study group. There was a fairly even spread of rates between these figures. Interestingly, there appeared to be no correlation between the indices of deprivation figures for participation in HE and how the students described their personal and family history of HE. In other words the two students who lived in the area with fewest adults in education, Laura and Den, had very strong personal and family histories of HE,

> "*Because I think it's because my brother and my sister both went straight from college and my brother did physics and my sister did biochemistry...my mum did* "[go to university]
>
> *Laura interview 1*

However, Marion came from a neighbourhood where only 15% of adults were likely to participate in HE and she too had no family or personal history of HE. A combination of contributory factors related to personal and local societal attitudes or experiences of HE may be important in terms of expectations, attitudes and skills.

Educational level and educational methods experienced

Traditionally, students enter HE in the UK at 18 years of age with A levels or other equivalent level 3 qualifications, according to the National Qualifications and Credit Framework (QCDA, 2009). Figure 10 shows the range of qualifications possessed by the students in the study.

Highest level of Qualification	Number of students (subject)
A levels	1 (psychology, English, biology) 1 (biology, chemistry, physical education)
BTEC National Diploma	1 (pharmacy) 1 (health studies)
Higher National Diploma	1 (chemistry)
First Degree	1 (software engineering) 1 (health studies and IT) 1 (natural gas engineering – undertaken in the USA)
Higher Degree	1 (systems engineering)
Access to Higher Education	1 (subject not specified) 1 (life science)

Figure 10: Qualifications possessed by the students in the study

In addition to the wide range of 'highest level' qualifications, some students possessed additional lower level qualifications (i.e. qualifications above level 3 but which were lower than their final entry qualification indicated in figure 10) including a diploma in nursing, a HND in computing and BSc in physics. Three students started other degree programmes but terminated them part way through due to lack of interest in the subject (environmental health) or personal difficulties which meant they had to move away from the area (radiography – two students studied this to part way through year one). One student had undertaken their high school and level three education in the USA. No students had personal experience of PBL although one had a son who had studied medicine using PBL.

Family dependents

Five of the study students had children. For two of these students, their children were grown up and independent. One of the parents had five children. Two students had elderly parents who were dependent on them for daily help. One of the 18 year-olds had parents who were chronically ill so she undertook significant caring duties and also provided financial support. Only two of the students lived in their parents' home. One lived in university accommodation and the rest were home owners. All students were entitled to a National Health Service (NHS) bursary and course fee payment.

The BSc (Hons) Diagnostic Radiography programme runs over an extended academic year since, in addition to the standard attendance pattern for a full time BSc (Hons) degree, the students are required to attend 15 weeks per year in full time clinical practice. This

limits the time available to spend with their families, earn a part-time income and prepare for their assessments to nine weeks over the year.

During the course of the first year, four of the students had to take an interruption to their studies as a result of mental and/or physical illnesses.

This picture outlines the external pressures which might impact on the ability of non-traditional students in general, and these students in particular, to fully engage in their PBL study, in particular in terms of independent study and preparation for feedback. Knowing that they are not fully prepared may increase the weight of the FTA.

Work History

In addition to being parents, the students brought with them a wealth of experience in the form of previous employment. This included: being a lecturer in physics, computing and IT; computer programming; sterile services technician; health care assistant; care centre assistant for disabled children; waitressing; community enterprise work; nursing; clerical work; pharmacy technician; voluntary respite care; and laboratory technician.

Additional skills

In addition to paid employment, the students were skilled in other areas such as: Sufi training and mediation; running at county level; drawing and painting (with exhibited work); captaining sports teams; knowledge of alternative medicine. Having prior knowledge, skills and experiences to draw on may reduce the weight of the FTA.

Group Diversity

In highlighting differences between these students and those from more traditional backgrounds, I have also shown that the students in the group differed from one another, creating a diverse PBL group. This diversity, if perceived by the students, may impact on the communication strategies used in the group to manage the interactional functions since the social distance will be greater than where a group's members are homogeneous.

It is therefore important to determine if difference was construed by the individuals by asking, how did individual students position themselves in relation to other group members?

Perceived similarities and differences

Age

When asked whether they saw themselves as being different from, or similar to, the rest of the group, students most frequently identified themselves with reference to their age. Indeed every student made some reference to age differences in the group without being specifically asked about this,

> "I think I am the eldest one in the whole class so you know, it's nice to be in with other people that are in the 40's cos I think there's four of us in that group that are maybe from the similar age. I just hit 50 but the rest of them are early or late 40s so that's quite nice for me as an individual"
>
> *J interview 1*

> "I'm one of the more older of the group probably but while I realise that I'm not the oldest, I'm not the youngest"
>
> *Ed interview 1*

> "Like when I went home I'm like telling like my family and stuff, cause you don't expect, cause you think you go to uni, they're all from college but it's the opposite isn't it? I'm like in the minority"
>
> *Emma Interview 1*

Some students stereotyped age and gender. Being a mature female was likened to being a mother-figure for the group,

> "Sometimes because you feel that when somebody's saying nothing you do tend to have that mother feeling oh I better say something then. I do tend to be rather than staying silent and think oh I better say something. Yes there is that little mother side to it. There is a little bit of that"
>
> *Joyce Interview 3*

Similarly the younger students identified one of the older students as having a maternal role in the group,

> "yeah I don't know what you think of me saying this but I see you, she's like the mum of the group"
>
> *Pam focus group 1 (talking about Marian)*

If age is thus identified by students as a significant identifying factor, there may be some inter-generational influences on PBL interactions.

Ethnicity

Four of the students were from non-white ethnic groups, although none of these were from the same group (Pakistani, Mauritian, Korean, Chinese). However, there was little mention of difference or identity based on ethnicity. When this questioned was asked one student said,

> *"I'm Chinese, that's different"*
>
> *Interview 1*

And when asked whether this was a cause of concern in terms of integrating with the rest of the group he said,

> *"I don't think so. What's different? I can't think of anything"*
>
> *Interview 1*

No students proffered comment on the ethnicity or gender of other students in the group. I return to this issue in the discussion.

Educational level and subject

Despite the wide range of academic entry levels presented by individuals in the group, none of the group members commented on this feature as contributing to difference or similarity. For instance, no-one made reference to the fact there were graduates in the group who might be able to help with regard to academic skills such as searching for literature and referencing.

Students did acknowledge one another's specialist background knowledge in terms of subject however. Marian when asked what she admired about other students said,

> *"*** knows about his physics, *** you know has got knowledge through family life and she also started the course last year at Bradford so she's got a little bit of, ***'s got his pharmacy"*
>
> *Marian interview 2*

(Students names replaced with asterisk to retain anonymity)

This demonstrates the value students put on discipline-specific knowledge rather than academic or intellectual level.

Social background

There was no reference to different social backgrounds between group members. However Jay acknowledged that,

"I'm trying to engage with other people who I wouldn't normally meet you see on a Friday night"
<div align="right">*Jay interview 1*</div>

Here, Jay is implying that cultural dissimilarity impacts on the potential for socialisation amongst the students.

I have shown that there are differences between the students in terms of age, ethnicity, gender, social background and educational level. However, the students' perception of these differences is less distinct. Indeed one student (male, 57 years, Mauritian with graduate qualifications) said,

"I'm a student like the others so we are all in the same boat. We start together we're doing the same course and all the rest of it. So I feel on sort of on equal footing on those terms with them. Then I obviously I have my own individual experience or traits and so on but I think I share a lot of common ideals with them, yes."
<div align="right">*Interview 1*</div>

Thus the formation of in-group solidarity appears to predominate over difference. Nevertheless, the frequency with which age was mentioned as a differential was significant and this might be a source of power struggle. I return to this point in the discussion.

Communication style and interactional ethos

Group Identity

To determine whether the developing identity of the group appeared to influence or be influenced by the communication strategies adopted, individuals were asked what they thought about the group. Jay said,

"…some of them for whatever reasons don't particularly want to engage on a personal level, it's strictly professional and that's fine there's not a problem with that"
<div align="right">*Jay Interview 1*</div>

Here, Jay suggested that the primary purpose of this particular group appeared to be to achieve the interactional learning goals and that this is prioritised over social goals. This suggests that students would engage in FTAs and adhere to societal rules in order to achieve their goals. In terms of the Socio Pragmatic Interactional Principles (SIPs), Jay suggested that the group, therefore, appeared to show a preference for association-

detachment rather than association-involvement. To analyse this further, all students were questioned about the group identity during individual and group interviews and these are exemplified in figure 11.

Description	Source	Illustration
Comfortable	Emma interview 2	*everyone's comfortable together and no-one's like, there's no like leader of the group or anything. Everyone just says like what they think and everybody is comfortable with each other.*
Considerate	Ann interview 1	*Everyone seems to be very considerate for how others are feeling and yes I thought it would be awkward but hasn't been.*
Co-operates	Ian interview 2	*I think everyone co-operates and everybody, just everybody chips in and reinforces what each other's saying and people do, perhaps they don't challenge people, but they just perhaps want a further explanation of something*
Encouraging	Ed interview 1	*Maybe just say that we're all trying to help like really encouraging really you know just not anyone trying to be, just kind of yes, really a nice atmosphere to work in.*
Friendly	Den interview 1	*Yes, I mean so far I must say we are very comfortable and on friendly terms group*
Helpful	Ed interview 2	*It's great because they always have something to say and it's always helpful, everyone of them you know.*
Honest	Ed interview 1	*I have to think about it and we were talking about it as if we were being honest with each other. Saying "actually I struggled with that" and someone else would say "yes, I did too actually".*
Inclusive	Harry interview 1	*Everyone seems to be expressing their ideas and talking. But no-one's keeping quiet I think.*
No dominance	Anne interview 2	*No-one tries to take over or shout anyone down or anything. They're all, everyone is willing to take a turn and listen to other people. It's very much like that*
On-edge	Jay interview 1	*The only other thing I would say is that there isn't enough I wouldn't say humour, but people are not relaxed enough. I think people are too on edge.*
Professional	Jay interview 1	*You know, there's no negativity and everybody seems to be quite professional and getting on with the jobs you know, tasks we're given.*
Quiet	Marian interview 2	*As a group I think you know, we can all voice our opinions so within the group we're okay but we're quiet compared to other groups,*
	Marian to others in PBL 7, during tea break	Marian asks if they have been on the group discussion page on Blackboard she says they must be the only group that hasn't sent each other messages. Laughs *"we just don't communicate at all do we?"*

Respectful	Joyce interview 2	it's a quiet group and very respectful group it is very secure so that's not really putting you under a lot of pressure in that respect.
Safe	Joyce interview 2	It's a very safe group. It's a very safe group … in this particular group I feel quite confident to speak because I don't feel the group is very judgemental at all, which is very nice.
Sensitive	Ed interview 1	I think we are like that we're very sensitive with each another.
Sharing	Joyce interview 2	the actual people feeding back is very shared. It really is very shared which is nice but then there's always that point where you're waiting for your turn
Shy	Joyce interview 1	I think you've realised by the tape we're in a group that is quite shy anyway
Understanding	Ed interview 2	and there's a certain flow with the group and a you know, understanding. We don't mind really whoever stands up or doesn't stand up. We have a really easy-going group.
Unpressured	Ian interview 1	there's no pressure and everybody's supportive

Figure 11: Students' descriptions of the group identity

Comments reported in figure 11 show that some students concur with Jay's assertions, especially Marian (see 'quiet') and Joyce (see 'respectful). Others, however, report the group to be 'friendly', 'encouraging' and 'helpful'. Thus there is a mixture of perceptions on the association: involvement/detachment SIP.

The descriptors used by the students also reflect a group which is unpressured and non-threatening. Students identify that they do not pose risks and challenges to one another and are happy with this. It seems, then, that for these students the notion of a 'good' group is one where face threat is minimised and group ethos is to retain rapport. In terms of the equity SIPs, the group showed preferences for equity- autonomy and there were no suggestions whatsoever that equity-imposition had been experienced. However, despite self-reports that the interactional ethos was one of 'sharing', the video data of the group in interaction identified that the opinions of some students were valued less than those of others. This replicates Tipping et al's findings that self-reporting may be at odds with observation (Tipping, Freeman et al., 1995). Instances of deference and dismissal were coded within the relationships feature of Nvivo. The younger students were less frequently held in esteem by the older students and when there was contradiction in learning or understanding, it was most frequently the older students' input which was settled on as being correct. This was never based on validation with reference to supporting evidence and quite frequently it was incorrect; the younger

student had arrived at the correct learning outcome but this was dismissed as incorrect by the others in instances of disagreement.

In the following example, Pam (18 years) demonstrates critical analysis in questioning the validity of a reference source for an alternative medicine advert that is being used to support a standpoint. Jay (39 years) has a personal interest in alternative medicine and defends this concept rather than addressing the learning issue, which is the value of the reference source,

```
1 Pam     it's it's it's gonna be ((flexes arms round back of head with face slightly down and tugs on
2          ponytail)) slightly biased though ◦isn't it ◦ they're wanting you to (0.1) go to them (.) they're
3          gonna swing it their way aren't they ◦ (1) ◦don't you think◦ (0.5) it's not (0.1) gonna be(.)_as
4          (.)((pulls down on front of jumper)) good as what you're gunna get off the ((scratches her
5          back)) NHS (.)  direct website ◦and stuff like that◦ (.) ((looks at tutor)) I don't think =
6 Jay      = well I I disagree with that  because I know erm I know one of my friends he had really bad
7          dermatitis and went to ( ) everybody and couldn't get it sorted out and went to a traditional
8          Chinese=
9 Pam      = yeah I understand [what you're saying ((scratches brow))
10 Jay                         [you know practitioner in London and he was sorted  (0.5)
```

<div align="right">PBL session 5</div>

The example shows that Pam's body language suggests she is uncomfortable in making her point. Following Jay's disagreement she fails to defend her argument further. A similar example from PBL session 4 is provided below. This shows Jay (39) agreeing with Joyce (50) rather than Pam even though Pam is correct in her argument

1	Emma	do we have to look at how to like <u>adapt</u> (0.2) everything you ((others – yeah)) know like the
2		exposure factors whatever (.) the different types (0.1) in different situations really isn't it
3		(0.2) cos she could have °osteoporosis°
4	(1)	
5	Joyce	but would we <u>necessar</u>- change the exposure factors cos <u>that</u> would just show up anyway
6		wouldn't it with the (0.2)
7	Jay	[that's what I-
8	Pam	[no cos if she <u>has</u> got osteoporosis you] wont have a clear picture [would you?
9	Joyce	[that would <u>indicate</u> to us that's she's <u>got</u> it] ((facing towards right to Jay and ignoring Pam
10		on her left who is speaking))
11	Joyce	[no
12		((Joyce turns head slightly to left towards Pam))
13	(0.2)	
14	Pam	°it wouldn't be as clear if you've not got the right exposure factors° ((looking down all the
15		time she is speaking, wearing a baseball hat which hides her face, Joyce looking at Pam then
16		facilitator))
17	(0.5)	
18	Joyce	but that would just be ((turns to look at Jay)) <u>a standard</u> exposure factor ((looks at Pam)) for
19		that
20	Pam	°yeah (.) yeah ((looking down))
21	(0.2)	
22	Joyce	obviously depending on <u>different factors</u> of the patient but-
23	Jay	yeah I I think [you know I I think that we er we need to <u>know</u> obviously for (0.5) a typical kn-
24		knee[what (0.2)
25	Joyce	[<u>yeah</u>
26	Jay	<u>factors</u> you know what mAs we should [have it's a thicker it's a [thicker=
27	Joyce	[( ) [yeah
28	Jay	= part of the body so (0.2)
29	Joyce	you wouldn't adjust the exposure factors because somebody's got oste <u>erm</u> osteooarthritis
30		would you (0.2) cos <u>that</u> would just be that would [<u>indicate</u> =
31	Jay	[that that's what I thought
32		an' all
33		
34	Joyce	=from the normal x-ray that there's something wrong with that knee
35	Jay	yeah that that's what <u>I was thinking</u> as well and I that's what I'm more like (2) I'm like Joyce
36		on that one
37	((Joyce and Jay laugh, Harry, Ed, Marian and Ian smiling))	
38		PBL session 4

In this extract, Pam can be seen to compete with Joyce and Jay at line 8 to present her argument. Joyce's body language subsequent to this suggests she is not convinced by Pam as she continues to address Jay and is thus appealing to him for support of her own standpoint. She also looks at the tutor for clues as to whether Pam's argument is valid (line 15). Pam's lacks of conviction expressed in her body language and quiet voice at line 14 does not persuade Joyce who persists in pressing her own standpoint forward at line 17 without a reasoned argument. Pam reluctantly agrees with Joyce at line 19. None of the other students joins in the debate except Jay who appears to agree with Joyce in spite of a lack of argument and he confirms this at lines 34 & 35.

Whilst there is no evidence that the issues concerned in either of these extracts relate to age differences between the interactants, it is interesting to note that on both occasions the younger student presents a more reasoned argument but in a self-conscious manner and fails to defend her argument when challenged.

Group Goal Priorities

Students acknowledge that their interactions are 'business-related' rather than social. Comparing themselves to other groups they acknowledge that they don't communicate very much and Jay suggests there is a lack of humour. Furthermore, the group does not engage socially at all outside of the PBL session until the final week of the first semester when they arrange a celebratory meal. Den is even seen to ask Anne to remind him of her name during week 8. This is perhaps not surprising given the difference in social and demographic make-up of the group. Where socialisation is evident it is between students of similar ages. Emma and Harry communicate on the Facebook social network site, for instance, and the mature females talk about going to the refectory together.

In summary, the group appears to demonstrate mild association-involvement although two or three students perceive the ethos to be more reflective of association-detachment, perhaps illustrating a difference in people's expectation of socialisation in such a group. However there is clear evidence of equity-autonomy, with students avoiding imposition on another student's face. The danger for such a group might be that FTAs are avoided by individuals and this avoidance is ignored or goes unchallenged by

other members of the group, despite the obvious frustrations of one or two members as indicated in Jay's comment. The interactional learning goal remains superficial and safe, despite the rich diversity of skills, academic level and previous knowledge that is prevalent in the group. The next section will therefore concentrate on the FTAs identified by the students and reported in section 3:1 to determine if there is evidence that these are avoided.

Section iii) Strategies

Rapport Management strategies used to manage Face Threatening Act

Introduction to section

In section i) I have outlined the interactions which students identify as specific to 'doing' PBL and, in their descriptions, students identified many of these interactions to be potentially face-threatening, or of high 'r' in terms of imposition. Section ii) showed that students acknowledged a noticeable social distance (d) between group members. There was no suggestion from the students that a power differential (p) existed, although age differences were frequently mentioned. These age differences, and others which were not articulated by the student such as gender and ethnicity, may act at a subconscious level to create power differences which would be reflected in the communication strategies chosen to manage rapport. Using the RM narrative the next section will show how this group, with a large d and potentially significant p, managed rapport when faced with FTAs. It relates to the 'actions' category of the theory derived through grounded research.

In section i) students identified interactional functions associated with the various roles so these will be considered in turn.

Chair

Singling out people to contribute

Chairs often avoided this interactional function. In the focus group interviews, students said they appreciated a chairing strategy which singles out other students as this encouraged input, but admitted to not being able to use this strategy themselves,

> Marian   but the other side of that then (0.5) is if they're not too sure of what to say and you've said right tell us
> Emma   yeah you're putting them on the spot aren't you
> Marian   yeah and that could put someone in an awkward position as well so
> Pam   I'd feel a bit tight doin' it myself ((laughter)) I'd be like oh no I don't want to tell you to do that
>
> *Focus group 1*

These students are putting other's face before their own as they do not want to make a request of the other students and requests have been described in the literature as -

threatening speech acts (Brown and Levinson, 1978). In avoiding requests, however, they are flouting their role as chair which is to ensure everyone contributes. As a result, group rapport is maintained but learning is limited, and therefore negatively impacted, due to a less inclusive range of input.

The exception to this communication strategy from a chair can be seen in Harry's behaviour,

1 Harry	define osteoporosis, Anne ((others laughing)),
2	(8) ((Anne flipping through her papers, smiling))
3	((joking asides between Harry and Anne))
4 Marian	you're <u>enjoying</u> it aren't you= ((to Harry))=
5 Harry	=<u>yeah</u> (0.2) cos I I don't have to <u>say</u> anything ((laughter))

<div align="right">PBL session 6</div>

At line 1, Harry can be seen to be inviting Anne directly to provide feedback. Anne's delay in speaking up and her body language suggests she is uncomfortable. However, she smiles and makes an inaudible but humorous comment to Harry at line 3 which suggests she is comfortable with the legitimacy of this imposition. Harry's comment at line 5 suggests he is using his legitimate power as chair person to deflect the face threat to others. In doing this, he upholds his own face as a chair person who is carrying out role obligations and also protecting his face from potential threat. This might be perceived as a strategy which would threaten group rapport however, when discussing his strategy in the focus group the other students perceived Harry's style to be effective, they said,

Joyce   Harry's done the last couple of er chairs and he's literally
Harry   just gone for everyone
Joyce   for each object he's literally pointed at one of us to start (laughter)
Anne   he's scary
Harry   they just sit there and say nothing
Joyce   yeah it's quite clever that

<div align="right">*Focus group 1*</div>

It is interesting to note Anne's use of the word scary which supports the notion that contributing constitutes an FTA. Nevertheless, students appear to appreciate Harry's move. This could be due to a number of reasons: i) he is permitted in his role as chair to make such a move, ii)students appreciate the positive impact on group learning and inclusivity, despite the threat to face, and iii) Harry's approach is one of association-involvement in that he uses humour and laughter in carrying out his actions. This would act to enhance group rapport by reducing social distance.

However, as mentioned above, despite a general endorsement that this strategy works, none of the other students use it in subsequent sessions. Modelling in this instance, then, even by a member of the group, has not been sufficient to overcome the group ethos for autonomy with relation to the equity SIP.

Leading the process

Students highlighted that chairs were expected to lead the process but, despite having a written guide to help them through, expressed concern that they did not know how to do this. Students were acutely aware of the chair's obligation to take the lead in this regard as there were very few instances of other students stepping in to help out if a chair was struggling. Instead, lengthy silences ensued (quantified in figure 12, p112).

On one occasion a student attempted to take over the lead but then corrected himself as shown in the next example from PBL 6. Here, Harry is the chair and Jay wants Harry to move on to the next stage before Harry believes the issues have been fully discussed,

```
1 Harry          anything else
2 (2)
3 Jay            that's it
4 (7)
5 ((Jay looking at Harry as if to say move on, others looking down at their work))
6 Jay            ◦that's it◦ (0.2) carry on
7 Harry          what about the diagrams (1) the text the radiographs ((smiles and shakes
                 head)) are we on to the next one (0.1) ALREADY ((smiling broadly))
9 Jay            () oh go on carry on you do you do the chair person (0.2) ◦you decide◦
10 Harry         so you understand (0.1) what's what's that as well (pointing to the image on
11               the screen)
```
<div align="right">PBL session 6</div>

We can see Jay specifically instruct Harry to move on in direct unmitigated speech. Harry responds indirectly and with association –involvement style, which includes smiling, but stands his ground that there is more yet to discuss. At line 9 Jay acknowledges that it is not his role to make the decision to move on. Therefore, despite the dominant position of Jay in the group (as illustrated later), the rule that the chair makes the decision to lead is acknowledged between the two showing the importance of sociality rules and obligations.

Most frequently it is the facilitator who challenges the chair. Such interceptions were experienced by the chair as face loss as a result of being seen to fail in their task, as illustrated in the next example,

(8)
Marian   ok we need to find out about the:: different radiographic techniques so it would [be: (0.2) erm
Facilitator 1   [shall we just look at the (.) let's look at the knee (.) as well don't forget we need to look at the anatomy of the knee
Marian   oh right yeah ((Marian starts writing down))
Facilitator 1   that's alright
(3)

In this example, Marian is attempting to move on to the next stage after quite a long silence. This move has been difficult for her as she is the first person to chair so is unsure of the procedure. In addition, she has had to synthesise information on the flip charts from the brainstorming session to create a new objective which is cognitively challenging too. Furthermore, in articulating the objective she has to use discourses new to her from radiography and education. She makes the move but is cut short as the facilitator interrupts her and suggests further discussion is needed. Marian's response is to withdraw physically; she looks down and starts to write, disengaging from the discursive role of chair, and then fails to continue. The facilitator perceives this withdrawal and attempts to boost her esteem with the final comment. Silence persists however and after 5 seconds silence another student (Emma) takes over.

Summarising learning

Students acknowledged the importance of summarising at the end of each objective and that this is the chair's role as can be seen from this interview with Harry,

Interviewer   What did people say about you?
Harry   I'm good at chairing. What?
Interviewer   What do you think about that? Is that true?
Harry   I don't know. I don't think it's true.
Interviewer   Why don't you think it's true?
Harry   I'm not that good, I don't really summarise anything or stuff. I got people talking that's all.

In this interview Harry highlights the importance of summarising and shows self-awareness by admitting to not carrying out this role. None of the other students

summarised as the chair either without being prompted by the facilitator. Even when they were prompted they failed to provide a comprehensive summary of the discussion. This suggests the task itself is cognitively difficult. Indeed, such synthesis of information is deemed high order in taxonomies of learning such as Blooms (Atherton, 2010). It is possible that such avoidance, then is to save own face from negative judgement, and that this is a greater potential face threat than flouting their role obligation to summarise.

Managing communication

In this FTA, the chair needs to be able to manage the discussion. Actions might include stopping individuals dominating, bringing in quieter students, stopping students talking over others and preventing multiple conversations from occurring. To do this, the chair needs to exercise power legitimised by the temporary authority of the position.

This role of the chair was not identified by any of the students in their interviews and, furthermore, there were no occasions when this type of leading from the chair was witnessed. This may be because the group tended to be a quiet group with more silences than instances of unruly communicative behaviour. Yet there were occasions when there was over-talking between students such that it was difficult to hear what point was being made. For the chair to exercise their power in addressing the communication style of others would constitute an FTA, since they would be demonstrating a disagreement with their behaviour. Furthermore, making requests of them infringes the sociality rights of the other student to remain unimpeded and by showing them to be acting inappropriately, according to the group's ground rules, it would also lower their self esteem. This, in turn, may also threaten the rapport of the group but would support a more productive learning interaction. Again, students in the role of chair, are choosing to put face and group rapport before role obligation. Clearly, carrying out this communication management role also requires discussion management skills which some, but not all, students had had previous experience of.

It is also the role of the chair to direct the scribe and ensure they are capturing the discussion. Chairs appeared to be more willing to direct the scribe than they were to

direct group members and this may be because the role of scribe is task-oriented and well-specified within the ground rules. The scribe is assigned a set of tasks they know they have to perform and there is no voluntary dimension to the role. Nevertheless, directing the scribe, when required, was generally done in an indirect manner, supporting the assertion that, for this group, the act of directing and requesting others is face-threatening, as in the following example,

Ian   *so shall we get that down then ((to Ed who has not been scribing but looking through images – all laugh when he realises))*

PBL session 2

Here Ian uses an indirect, mitigated approach by directing Ed through a question rather than a command (Fraser, 1980). He also uses the word 'we' claiming an in-group association with Ed. This indirect approach is a way of ensuring the role obligation is fulfilled with minimal impact on the face of the other.

It is clear that the role of chair is the most powerful role in the PBL process and that all students give credence to this role. For the student who is chair, there is a fine balancing act between protecting face of self and face of others. Despite the potential for legitimately being able to threaten face of other students, chairs in this group tended to put the face of others before their own obligations as chair to carry out the role. Thus face issues dominated over sociality obligations. Furthermore, when required to complete complex cognitive tasks related to the role, i.e. synthesis and summary of learning, this was deemed to be a greater threat to own face than flouting the role obligation to do so. The outcome of these strategies on learning will be reported and discussed in the next section.

Scribe

In section i) I showed that students described the scribe's interactions as uni-directional. In other words, the other students speak and the scribe captures the conversation. Because of this there is little opportunity for the scribe to engage in interactions which would be face-threatening to others.

The potential for face threat, for the scribe, is therefore to self only, and tactics to reduce this were observed. In particular, students displayed modesty or self-effacement regarding their spelling and hand-writing, thus reducing the expectations of others so that they may not be judged too harshly. All students did volunteer to take turns in being scribe however demonstrating a group ethos of fairness and equity. The group also saw the scribe role as tightly defined, incorporating tasks which were free of ambiguity, unlike the chair where leadership skills were required. This may also have helped the students in engaging freely in this role.

However, when there was a need for a student to volunteer to write on the chart in an ad-hoc fashion, there was less willingness to volunteer. On one occasion a scribe was called for, during the feedback, to draw a diagram on the board. The feedback stage does not normally require a scribe. There was, therefore, some discussion about who this should be, i.e. should it be the student who was the scribe for the preceding (Emma) or subsequent (Laura) brainstorming session? The following discussion ensued,

1. Facilitator 1	would anybody like to <u>scribe</u> for us ∘make a few notes up there∘ so we can see what we're looking at
3. (3)	
4.	((facilitator moves arms around group from student to student suggesting anyone can volunteer))
6. Ed	er I don't mind scribing
7. (2)	
8. Facilitator 1	but you're chairing (1) ∘so we need somebody else∘
9. Ian	who's the scribe this week
10. Ed	er Emma (0.1) was it Emma
11. Emma	∘I did it <u>last</u> week∘
12. (0.2)	
13. Ed	are you still the scribe er though for this trigger
14. (2)	((Emma shrugs))
15. Den	who's scribing this week ((looks to left at Ian, Joyce and Marian))
16.	((Ian and Joyce looks through the list of roles the group compiled at the beginning of the semester))
18. (6)	
19. Joyce	I don't know who's the scribe this week ((looking through her notes)) Is it week 4
21. Ian	yeah
22. Joyce	no it's week 5, so Ian should have been chair and Laura have been scribe…
23.	((looking at Laura))..
24. Den	no we're on week 4
25. Joyce	cos you've got to scribe anyway for the new trigger anyway haven't you (1) for the new trigger haven't you

27.   ((Laura sighs, removes her cardigan, body language is of reluctance to
                       scribe))

Two sources of ambiguity are present in this passage. Firstly, the ambiguity lies in the absence of a ground rule to state who should carry out ad-hoc writing on the flip chart. Interestingly, the facilitator, in suggesting someone writes on the flip chart, asks for a volunteer but does not suggest this should be the nominated scribe. It is the students, in particular Ian, a mature, white male, who suggests it should be the scribe. No-one disagrees with his idea. The second source of ambiguity concerns which scribe it should be. At line 13, Ed indirectly suggests Emma should be the person who scribes as this is the same trigger, even though the week is different. At line 15 Den appears to support this assertion. However, at line 25 Joyce, a mature, white female makes a strong suggestion to Laura, as the scribe for this week's new trigger, to write on the flip chart. Laura does not argue her case but takes on the task.

Some power issues are, therefore, also present in this extract. Laura is similar to Emma in demographics, a young, white female, but her approach throughout the sessions has been to position herself as a subordinate, through the general manner of her inputs which are infrequent, quiet and self-effacing (described further below). Emma, on the other hand, is direct and her participation is frequent. In this example, Emma perceives that she has had her turn as scribe so does not want to be imposed upon to do it again. She defends her sociality rights. Laura, expresses a similar reluctance, but is not strong enough to exercise these rights, and is the one who ends up carrying out the task. Furthermore, the support that Emma receives from the other students comes from Joyce, who also is a dominant group member in terms of participation style, and who the students later come to describe as being like a 'mother figure' for the group, whereas Laura's support is from Den and Ed, both mature, non-English males who are similar to Laura in their subordinate style of participation and use of association-detachment strategies (discussed below).

This illustrates the importance of role definitions and rules. Without the rules, students have to negotiate the best course of action which can lead to a threat to group rapport

by making some students feel their sociality rights have been impinged and that they have been dominated by stronger members of the group.

Group member

Interactional functions identified by students and perceived by them to be face-threatening

Students identified 10 interactional functions which were required of group members to engage in PBL (see figure 8, page 74); 7 of these they perceived to be face-threatening, namely: lateral thinking/brainstorming, disclosing and sharing previous knowledge, contributing to feedback, standing at the front, admitting own ignorance/misunderstanding, explaining concepts/paraphrasing, using new discourse and terminology. In the following section I will show how these seven interactions were managed.

Lateral thinking, brainstorming

Lateral thinking and brainstorming are required at the beginning of the process when students are presented with the trigger. They are required to make suggestions as to what the learning issue might be. This is complex, as it also includes relating previous knowledge to the current scenario (identifying Vygotsky's zone of proximal development). As educational backgrounds in this group are diverse, for each speaker the level of previous knowledge and understanding of the rest of the group is an unknown. Making suggestions in such a context could be face-threatening, and whilst students did engage in this process, observations showed that RM strategies were employed to reduce this face threat.

These RM strategies included indirect linguistic approaches, such as humour. Humour is an example of an association- involvement SIP move, since it serves to reduce social distance in the group and was most frequently used by the males, in particular Harry. In the following example students had been presented with a diagram of an x-ray tube (Ian is chair),

> Ian   does anybody know what it is ((all laugh))
> Harry   it looks like a light bulb ((laughter))

<div align="right">PBL session 2</div>

Association-detachment strategies were also observed. These attempt to reduce the imposition through the use of apologies and polite requests, for example, thus preserving social distance by privileging formality and 'manners'. These strategies were frequently employed by the Korean and the Mauritian students as the two examples below show. Both extracts come from the same PBL session when an x-ray request form has been presented to them with no patient date of birth,

Korean student	you know there's some space for someone to write there if (.)if they <u>did</u> sign would it have bin would it have bin written there (.) <u>sor</u>ry, I just er ((apologising for his contradiction to Jay's previous utterance))

<div align="right">PBL session 4</div>

and,

Mauritian student	erm may I ask please erm the fact that there is <u>no</u>: date of birth (0.1) er on this request <u>form:</u> er do we go ahead to (0.2) I mean in terms of identification, do we go ahead to do this: x-ray

<div align="right">PBL session 4</div>

Other RM strategies included those to protect own, rather than other, face such as the use of linguistic modifiers to express self effacement and questioning.

Using linguistic modifiers: self-effacement,

Laura: yeah it's the (0.3) it looks like the <u>vacuum</u> bit of it (2) ∘I think (.) I don't know∘

<div align="right">PBL session 2</div>

Using linguistic modifiers: questioning,

Ian: do (4) does do the er (0.1) does the cu does the current come from the (0.2) the cathode and then (.) <u>spin</u> off the anode (1) ((Ian laughs embarrassed))

<div align="right">PBL session 2</div>

And the use of non-linguistic approaches including seeking verification from the tutor or speaking sotto voce to another student

Non-linguistics: Seeking verification from a more knowledgeable other,

Joyce   well there's <u>two</u> main types of arthritis really rheumatoid ((glances at facilitator)) and osteo so ∘they divide into two don't they ∘ (1) I thinks there's <u>more </u>isn't there ((directs question at facilitator)) but those are the two main

<div align="right">PBL session 4</div>

Non-linguistic: seeking verification from an individual student rather than the group,

Marian: or is that just immobility of the joint ((sotto voce to Pam))

<div align="right">PBL session 4</div>

Some students avoided contributing to the brainstorming altogether and this was potentially rapport threatening. Jay expresses his frustration in the other students' strategy to only contribute when they have the 'right' answer,

> *"what I was hoping with the brainstorming for example, you say things and then it'll be filtered out whereas everybody wants it perfect first time."*
>
> *Jay interview 1*

All these strategies suggest brainstorming, or making suggestions in the absence of available knowledge, is face-threatening. The fact that students engage in it at all is possibly due to it being an explicit stage in the PBL process. The following is the instruction taken from the student's PBL procedural guide for the brainstorming stage.

Stage 3: For each problem ask, "what do we currently know about the topics raised in this trigger?"
(ANALYSE THE PROBLEM
What explanations or ideas are there in the group regarding the problem? Begin to analyse a problem if you have defined several. Use about 5-10 minutes for "brainstorming" around the problem. Do not discuss or reject suggestions; just note down all the ideas.)

A number of different strategies are therefore employed to minimise face threat and these may influence the identities that some students create for themselves. In particular, the students who use negative politeness and self-effacement may be positioning themselves in a subordinate role in the group which may impact negatively on future interactions.

Occasionally, however, some students, in particular Emma, used a more direct approach to brainstorming as can be seen in the following,

> Emma: go back to the <u>dia</u>gram (2) is it four (2) I reckon that erm erm thing is is the middle part and
> it's got like the anode in the vacuum (0.5) yeah (0.1) cos it's the right shape as well
>
> Emma in PBL session 2

Emma is direct in her request to the student operating the powerpoint when she says, 'go back to the diagram', she uses no politeness markers. This may be as a result of a younger people having a generally more direct approach in their communication (Martinez, 2011). Nevertheless, this may impact negatively on group rapport as it may be seen as impolite by those students for whom negative politeness is important. Her brainstorming is convincing however; she uses confirmatory words such as 'yeah' in the

middle of her suggestion and she backs up her proposal with logic. Such an approach is likely to position her more powerfully in the group. Emma is an 18 year old student. In the follow-up focus group at the end of the year Jay expresses his surprise that 18 year old students have so much to offer and his observations are based on Emma's input. Emma also achieves the most, academically and clinically, by the end of the programme. Therefore, analysis of the way students present themselves in PBL interactions might be a good indicator of how students will progress and, importantly, identify students who need further support. I return to this later in the discussion.

Disclosing and sharing previous knowledge

Despite the students acknowledging the importance of sharing previous knowledge this was often not carried out. Students with previous background knowledge in the subject being discussed were seen to withhold that information or knowledge from the rest of the group, or to provide the knowledge without explaining how they knew it. In other words they avoided declaring that they had prior knowledge in an area. The following example, a discussion about the meaning of cardiomegally, illustrates this point. Joyce is scribing,

Joyce	((writing cardiomegally on the board at the request of the others)) it's an enlarged heart ((said in a matter of fact way whilst still writing)) (0.2) I don't know if you (h)°-
(1)	
Harry	enlarged heart?
Anne	is that what it is then?
Joyce	yeah ((emphatic and clipped))
(6) ((Joyce writes this on the flip chart))	
Facilitator	do you just know that (0.1) or (.)
Joyce	I just know that ((laughs))
Facilitator	ok ((laughs))
Jay	you seem to know a lot ((group laughter))

PBL session 6

In this excerpt Joyce, who has studied radiography to the end of level 4 previously at another institution, does not declare the source of her previous knowledge. If she had, this would have added quality to the learning interaction through the validity of information. However, this would also have raised other students' expectations of her knowledge and she may risk not living up to these expectations on all occasions and thereby losing face. She may therefore have failed to declare her knowledge as a result of her prioritising face threat over her role obligation as a PBL student. In terms of impact

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on group rapport this is a neutral act since, unless the others are aware of the student's knowledge, they do not know information is being withheld. Another student, who had also studied radiography elsewhere for one year, explained that he withheld previous knowledge so that he would appear equal to the rest of the group,

> *"there are times when the lecturers will be asking certain questions I would rather leave the other students to answer even if I do know I mean I don't know all the answers but I try to leave it so that I feel I am just as one of them"*
>
> *Den interview 1*

This is a tacit acknowledgement that having knowledge differentiates oneself from the rest of the group and that the orientation for this student is to prefer group equity, thus enhancing group rapport, rather than seeing the knowledge as something that would enhance own face and contribute to group learning. The obligation as a group member in PBL to share previous knowledge is thus flouted in favour of group rapport.

For Joyce, having previous knowledge is seen as advantageous to herself rather than to the group,

> *"I was actually at [other University name] for the first, last semester. So I've got a slight advantage. Actually on the clinical side, because we had like four or five weeks in university and then we went out to clinical. So I have a slight advantage"*
>
> *Joyce Interview 1*

This extract reflects an individualistic rather than a collaborative approach. Another student also admitted that not having the same level of knowledge as the others would make him feel an outsider,

> *"erm only time I find I feel like left outside is when everyone has knowledge around that area and I don't really understand it or have no knowledge in that area"*
>
> *Harry Interview 1*

Therefore, despite PBL requiring students to acknowledge and embrace one another's unique knowledge for the benefit of group learning, to do so would appear to impact negatively on group rapport. This suggests that the perceived benefits associated with a diverse group of students, i.e. the ability to benefit from a diversity of knowledge, is not realised in practice due to social concerns of self face and group rapport, supporting Singaram's findings that the advantages of heterogeneity for PBL groups are often not realised due to the inevitable complexities of communication in such groups (Singaram, van der Vleuten et al., 2010).

Contributing to the feedback

This interactional function has been broken down into non-voluntary and voluntary contributions.

Non-voluntary contributions

In this scenario, the student is asked directly to contribute in some way. Direct refusals of these FTAs (where the face being threatened was self rather than other face) related to the student 'going to the front' or speaking out, i.e. instances where their self-esteem might be jeopardised.

In the following, the facilitator asked Marian to explain a concept further by drawing on the flip chart,

```
1 Marian:        = it's all in ere (points to head) but it's all jumbled up =
2 Facilitator:    yeah
3 Marian:        = and I have to try and sort of separate it all out and get it all logical in my mind you
4                know but yeah
5 Facilitator     could I ask you to stand up there [and =
6 Marian                                           [NO
7 Facilitator     = point out contrast and density to us if you want to talk it through
8 Marian          heh heh (shrugging embarrassed)
9                (3)
10 Facilitator    if you're struggling at the end
11 Marian         yeah no no I think I'm ok
12 Ed             it takes a while to sink in
13 Marian         yeah it does yeah I have to keep saying it to myself
14 Others          yeah
```

<div align="right">PBL session 2</div>

This FTA avoidance strategy avoids immediate threat to own face i.e. the embarrassment of standing at the front and being centre of attention. However, unless politeness markers are used refusals threaten the face of the requester (Brown and Levinson, 1978). In the example above, Marian's emphatic "no" which is spoken over the top of the facilitator was not couched in polite terms but was a bald refusal. Thus although Marian refused to engage in the activity she considered to be face-threatening, she did engage baldly in a refusal without politeness markers which is considered face-threatening to the other. Saving own face is therefore seen by Marian as more important than saving face of other. In terms of upholding her obligations as a PBL student, although going to the front is not explicit in the group learning contract, engaging in challenging learning acts and

participating when requested is an expectation. Thus, her role obligation as a group member is flouted. The general rapport of the group is not threatened, however, as evidenced in the solidarity shown by Ed at line 12 where he supports Marian's assertion that concepts take 'a while to sink in' (and therefore going to the front will not help), and the general agreement to Ed's comment by the rest of the group at line 14. This justifies the assertion, reported in section ii) that the general group ethos is to support one another in not doing an FTA, putting harmony before challenge. The impact on the learning goal is that, in this instance, Marian was denied the opportunity to explore and enrich her learning using an alternative, visual, method. Continual refusal by students to face this challenge may limit the quality of learning since, during the focus groups and individual interviews, students acknowledge that learning from another student's explanation, as happens during student presentations, enhances their own learning.

Voluntary contributions

Students rarely volunteered to contribute feedback without being directly asked. Failure to volunteer is difficult to illustrate since, by definition, there is no action. However, when a request is followed by a silence, the implication is that none of the individuals in the group have chosen to do this FTA.

In the following example, Ian, as a chair, made a request for input related to subject knowledge,

1. Ian   er <u>cathode</u>, erm does anybody want to start with cathode
2. (6)
3. Ian   well I've put erm it's comprised of a tungsten filament

PBL session 3

Here, Ian is met with silence following his general request for a volunteer to contribute and as a result he had to provide the first input.

Silence is a face-saving tactic which may be used to reduce face threat to self as a result of fear of making an inappropriate or incorrect comment. Joyce confirms this in her interview when she discusses what influences her decision to talk,

"I think that it's a case of, you know, being sure of what you know, what you're talking about"
Joyce Interview 2

It could also be that failure to respond to Ian's request may be related to the fear of going first and presenting self-face for appraisal by others, i.e. putting oneself on show for others to judge, even if the student knows they have the correct information to feedback. In the above example, all the students should have had some information to feedback on the cathode since this would have been their focus of learning for the week and is not a difficult concept, but rather a description of a piece of standard radiographic equipment.

The fear of being judged as a person rather than for knowledge would be exacerbated in a group where students are strangers as the perspectives and values of others is an unknown.

Jay alludes to this in his interview,

> "it can be easily misinterpreted you know, so you kind of think "oh that person perhaps doesn't like the last comment which I made". But whereas it could be just that's how that person is because you know, they could be thinking about something about your home situation".

Jay Interview 1

Jay is suggesting that lack of knowledge of the others in the group can lead to misunderstandings in interpretation of intent. If this were the case, one would expect to see the number of silences diminish over time as the group become more familiar. Therefore a quantitative analysis of silences, following requests for input in the first and last session, was conducted and is presented in figure 12.

PBL Session 1 (October 2008) Silences of more than 1 second			PBL Session 10 (April 2009) Silences of more than 1 second		
Number	Sum of all silences	Min/max	Number	Sum of all silences	Min/max
92	8 mins 45s	2secs/30secs	114	11min 56s	2secs/50secs

Figure 12: Quantitative description of silences

The data shows that there are approximately 100 instances of silences of more than one second per 3-hour PBL session, which does not differ diminish over time. Thus silences, for this group, seem to be used to protect own face from being judged as ignorant of the subject rather than being judged negatively as a person, or that the students have not become close enough for the FTA to diminish over time.

Whatever the reason, silence as a strategy flouts the role obligations as a group member to contribute. In the short term this is rapport-neutral as there is no attack on the face of

the other, although indirectly the chair is ignored by the group and this can make the chair feel uncomfortable in the role.

When asked how he experienced being chair, Ian said,

> *"Well I found it quite tough to be honest. When I did it, I think people just were, didn't know what to say or anything and I could feel that cos everybody just put their head down."*
>
> *Ian Interview 2*

Long term refusal to contribute, especially if this is perceived by the group to be inequitably distributed, could threaten group rapport. Learning is negatively impacted as the voice of not all students is heard, or one voice begins to dominate. Thus, multiple perspectives on a topic are not heard. Finally, often the chair feels a need to start the feedback when requests for input are ignored (as in the example with Ian above). This establishes one function of the chair to be the 'filler in of silences' and 'the one who goes first' which then puts students off volunteering to be chair and could explain why this is such an unpopular role

Standing at the front

"Standing at the front" is a means of presenting feedback but is distinguished from other forms of feedback as the student is not sitting down around the table but assumes a didactic role at the front of the classroom. This usually involves some form of visual aid. The requirement to stand at the front is not explicit in the ground rules for PBL. Rather, students volunteer to present their feedback in this way. Students identified standing at the front as an interactional function which was face-threatening. As this is a voluntary interaction and students found it face-threatening, it was very rarely taken up in the first semester. Indeed only one student volunteered to present his feedback this way. When asked why this was he said,

> *"I just need practise standing up in front of people, you know just talking that way"*
>
> *Ian Interview 2*

For this student, the intrinsic motivation to improve was stronger than the desire to save face. The other students were asked directly about why they did not like going to the front,

> Interviewer: is it the knowledge or the embarrassment thing
> Joyce   knowledge=

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Pam	yeah knowledge=
Emma	first of all the knowledge first=
Ian	I'd say more the knowledge=
Emma	yeah=
Anne	no I think it's the other way round I don't I don't mind getting it wrong

<div align="right">Focus group interview 1</div>

Here most students say that the need to be correct in their factual knowledge, i.e. the content of what they say, is the most important factor in terms of face. Anne, however, does not appear to be driven by 'getting it right,' but finds the notion of being the centre of attention face-threatening. When pushed further, Pam also acknowledges that,

"it's just that fear of standing in front of the class for me any way cos I'm quite happy to sit here and talk but I wouldn't get up there (points to front)"

<div align="right">Focus group 1</div>

And Marian says that it is about being "separate from the group" and "on your own". These distinctions are important as each requires a different approach for improving student engagement with feedback. The group needs to be socially close to enable the student to feel supported in such a face-threatening activity. For students who hold back because of fear of error, there needs to be further clarification of how PBL differs pedagogically from traditional teaching and learning methods, in that students are expected to declare ignorance and share misconception for the co-construction of knowledge to take place.

Admitting own ignorance and misunderstanding

Admitting ignorance was something students identified they would find difficult to do. However, in practice this did not appear to be borne out. Although it is difficult to observe when someone is avoiding admitting ignorance since, again by definition, there is no action. Nevertheless, one of the most common interactions was 'seeking clarification or questioning'. This is where a student checks their facts or understanding with the rest of the group or with someone who has just spoken,

Ian: oh I'm not sure if they're call are they <u>called</u>: the collateral ligaments °do people know that° (0.1) or is it just the site that I was looking at °that calls them that°

<div align="right">Ian PBL session 2</div>

This is a modified way to present feedback which is rapport-enhancing rather than face-threatening because when a student expresses lack of certainty regarding a fact or

concept the student is demonstrating modesty and self-effacement. Thus it is more permissible to declare oneself ignorant than allow others to do so. Furthermore, social distance is reduced through a willingness to demonstrate a levelling of knowledge-based power.

By offering another student the chance to respond to this general query the speaker also provides the opportunity for someone to enhance self-face. This interaction type is thus rapport-enhancing.

There was a tendency to avoid re-questioning, however, as was apparent in body language. In describing this interaction, I refer to instances when the hearer has misunderstood another student perceived by themselves to be as a result of their own ineptitude rather than as a result of a poor explanation by the other student. Therefore avoiding this FTA is as a result of saving own face rather than that of the other.

In the following example, there is a discussion about what kVp is (the peak energy of an x-ray beam).

1.	Marian	erm if we define kVp
2.	(2)	
3.	Ian	so that's the maximum energy of x-rays coming from the x-ray [tube]
4.	Marian	[tube] yeah yeah (3)
		◦that's what I got ◦
6.	Anne	◦it's just the speed isn't it◦
7.	Marian	[yeah]
8.	Laura	[it's the energy]
9.	Emma	[yeah] yeah it's the energy
10.	Facilitator	is it <u>speed</u>
11.	Laura	energy
12.	Emma	speed is something to do with the mAs rather than the kVp
13.	Harry	kVp's how much energy of the (photons)((looking at Anne, explaining to her))
14.	Emma	kVp's the maximum as well (0.1)
15.	Den	maximum yes
16.	Anne	that was- (1) ◦oh ◦ ((voice trails off))

PBL session 2

At line 6, Anne attempts to understand the difference between energy and speed, and at line 7 it appears Marian is also unsure of the difference. This is a physics concept which requires some background understanding of electricity and energy. Laura, Emma and Harry have this background knowledge and try to correct Anne but without an explanation. The facilitator, at line 10, notes the confusion in the underpinning

knowledge and tries to probe the students further. However the responses at 11 – 15 do not elaborate on the concept and it is unlikely that these provide any further information to help Anne and Marian. Indeed, Anne begins to attempt clarification at line 16 but her voice is seen to trail off.

Marian and Anne save their own face by avoiding further questioning. Group rapport is maintained as no-one else's face is enhanced or threatened. However the learning achieved at this point is sub-optimal for Marian and Anne and may also be so for the Emma, Laura and Harry, since failing to elaborate may have been due to lack of in-depth knowledge (i.e. they know energy and speed are different but cannot explain why). Marian and Anne's role obligations as group members is flouted, as they fail to explore what they do not know (admitting ignorance) due to fear of face loss.

It is important to re-iterate that students do not avoid initial questioning around a topic or concept. As can be seen above, at line 6, Anne is prepared to check her understanding. Indeed, as mentioned above, questioning one another was one of the most common types of interactions. This reflects the work of Visschers-Pleijers, and Dolmans et al (2006) who showed that in the PBL groups they observed, cumulative reasoning comprised more than 80% of interactions. What I suggest here is that this might be as a result of social factors rather than cognitive ones. While preliminary questioning offers the 'other' an opportunity to enhance own face, and thus enhances rapport, 'exploratory questioning' does not occur, because this would require the hearer to admit that they do not understand to the same level as the other students and also suggests that the student providing the explanation has not done so effectively.

Explaining concepts/paraphrasing

Explaining concepts is a feature of both feeding back and brainstorming but it is more complex in that it goes beyond making a statement of fact. Using Vygotskian terminology, it requires the student to transfer intrapsychological understanding (from intuitive knowing) to the interpersonal plane through the use of the shared semiotic of language and, for this, the student requires a number of attributes: i) to have a sound intrapsychologcal understanding of the concept, ii) to have the linguistic skills to convey

this information to others, and iii) have the confidence to know that i) and ii) are adequate. Without iii), the student risks face threat and may be unlikely to engage in this FTA. There was therefore, inevitably, discrepancy in the participation rates of each student with regard to 'explaining'. When students did brave the FTA a range of abilities was also observed. Those for whom English was not their first language used more fillers as exemplified in the following example,

> Ed: it erm er (0.1) it says erm move tube(0.1) I think it's from position L to position M er (0.1) I think it's er very much erm (.) you know (.) about that isocentric to er cos ( ) about L and M in normal radiography on a ceiling mounted ( ) erm it says rotate the cassette (er) through 90 degrees bring: the cassette holder to affected side so (.) the cassette holder would be probably on the affected so (?) so (0.1) er presumably the the er patient would be lying supine just the same er (3) and er …
>
> <div align="right">Ed PBL session 10</div>

Use of fillers such as 'er' and 'erm' are thought to provide the speaker with thinking time (Clark and Tree, 2002; Fehringer and Fry, 2007), but can also be perceived as 'powerless' markers and have been shown to reduce the impact of argument (Blankenship and Holtgraves, 2005). Younger students also tended to use fillers as well as linguistic extenders such as 'like', 'kind-of' and 'n' stuff'.

> Emma: is it like putting the er (.) erm like the exposure and er (.) like the mAs in the control an' obviously turning the key an' power an' like move yer x-ray machine (0.2) like line it up n' stuff
>
> <div align="right">Emma PBL Session 2</div>

Research has shown that the purpose of such extenders can be multifunctional, and can even demonstrate in-group solidarity in that the speaker implies there is an inferred understanding between them and the hearer, nevertheless one interpretation of such extenders is that the speaker has a lack of in-depth understanding of the subject (Cheshire, 2007).   As a result of these linguistic styles, younger students, and those from non-English backgrounds positioned themselves as having poorer communication skills and this was identified by one of the students in the focus group,

> *"I think er you three ((points to mature, white, female students)) make a lot more sense and you kind of bring things together"*
>
> <div align="right">*Ian focus group 1*</div>

Using new discourse and terminology

One requirement for being able to provide an explanation to other students was to engage in the use of new discourses, including radiography and medical terminology and

educational terminology (in the construction of learning objectives). Some students often refused to use these discipline-specific discourses. In PBL session 7, Pam was asked to read a definition from a medical dictionary,

> *"I'm not gonna read that word ((quietly under breath)) I can't even pronounce half of that" ((looking at dictionary))*
>
> *Pam PBL session 5*

And later when reading from her own notes,

> *"erm symptoms I got breathlessness dizziness quickening or slowing of the pulse rate er swelling of the ankles or legs including tenderness in the upper right quadrant and another word which I can't pronounce" ((laughter from others))*
> (5)
>
> *Pam PBL session 5*

Note the 5 second silence at the end of Pam's utterance illustrating avoidance by the others to correct or encourage Pam to attempt the word. The discussion moves on to another issue and the learning is thus hindered by the avoidance of this FTA. Failing to attempt difficult words avoids threat to own face, should the attempt be incorrect. It flouts the role of the student as group member in PBL since the learning challenge is not faced. There is no effect on group rapport since it is own face, rather than others' face which was at threat (and subsequently saved), although there is a sense of solidarity if all students are seen to be similarly wary of using the new discourse (as can be seen in the laughter illustrated above).

In the following extract Den also uses this avoidance strategy, even when others are beginning to engage with the new discourses,

> Joyce   oh yeah you can see [the patella yeah
> Emma   [yeah the patella
> Den   it's a yeah you can see that knee cap
>
> PBL session 1

Others attempt the discourse but convert it back to lay terminology as if to retain a link with their previous identity as a lay person,

> *"erm two temporal bones that's erm basically at either side of the head around the external auditory meatus (1) ear 'ole ((laughter))"*
>
> *Ian in PBL session 9*

Here, Ian converts external auditory meatus back to "ear hole" which elicits laughter from the rest of the group. The reason could be that students are trying to understand

and explain the new concepts in relation to their own mental schema which is couched in layman's terminology. This was mentioned in a number of the students' interviews,

> *"cos like all the lectures obviously they use all the technical stuff but even though you have to keep the technical words in but you can make it in well Layman's terms so it's more like easier for you to understand. If someone else is explaining it when they've just learnt it themselves"*
>
> *Emma interview 2*

and,

> *"but when people start to discuss it, you get it from a more of a Layman's view rather than the technical and it makes more sense"*
>
> *Anne interview 2*

However, the students who had previous experience of working in a health-related environment, and those who had studied health-related subjects, were equally reluctant to try out the discipline-specific discourses even though they were not new to them. It is posited that this is because to do so would be to appear to enhance own face. Communicative strategies for most of these students appear to centre not just on saving own face, and that of others, but also on modesty, i.e. not enhancing own face.

Nevertheless there appears a tension in choices regarding discourse. The above two interview extracts suggest students choose "layman's" language because this helps them to link new concepts to previous knowledge. Thus learning is enabled when familiar language is used. However, at some stage the students need to test out the discourse of their new knowledge community and this appears to present a gap that is to be bridged through some means of facilitation.

Interactional functions identified by students, not perceived by them to be face-threatening but observed to be so

Construction of learning objectives

Creating learning objectives was not identified by students as face-threatening, but appeared on the videos to be a source of difficulty as students found it difficult to come up with learning objectives at the end of the session. There may be a number of reasons for this. The terminology involved comes from the academic discourse since learning objectives require application of learning verbs such as describe, explain, identify etc. The importance of applying the most appropriate verb is impressed upon the students as this indicates the level of study required during the intervening independent study period.

In addition, facilitators have a set of learning objectives which they are expected to guide the students towards. Facilitators try to make sure the students go away with the 'correct' learning objectives rather than allowing some latitude in wording such that the learning objectives are personal to the group while still centring on the learning issues for the week. The students are aware of this and the setting of learning objectives becomes a game of guessing what is on the facilitator's guide, in other words wording the objective 'correctly'. When students have a 'correct answer' to find, the capacity for free expression, what Terry Barrett refers to as *"being in [PBL] flow"* becomes limited(Barrett, 2010). If they are going to risk 'getting it wrong', then they are not prepared to have a go at being creative. Some students demonstrate a commitment to their role obligation to come up with objectives while others sit quietly and refuse to play the game. Those who do get involved can be seen to play a word guessing game as the following long, but excellent, example illustrates

Emma	DESCRIBE the indications for performing an OPG (?)
(?)	((others muttering agreement))
Facilitator	do you want to DESCRIBE?
(3)	
Emma	state=
Joyce	explain
Facilitator	oooh I don't think explain (h) I think <u>describe</u> (0.1) do you really want to describe the surgery (h) why you want to (1) ◦state◦
Joyce	=◦state◦
(3)	
Emma	state the indications for performing an OPG examination
(19)	
Harry	describe the normal anatomy of the facial bones
Emma	and teeth
Harry	<u>teeth</u> ((looks at others)) (2) just facial bones
(10)	
Ang	did you say teeth in that one
Emma	oh (.) shall we put <u>that </u>including [teeth]
Marian	[including teeth]
Joyce	[including teeth]
(2)	
Facilitator	why why don't you put the anatomy <u>seen</u> on the OPG ((others mutter agreement)) rather than be er (.) specific
(5)	
Facilitator	opg image ◦or whatever you want to call it◦ (1) radiograph
(3)	
Emma	list er image appraisal
Marian	list er list the [criteria]
Emma	[criteria]
Facilitator	what's the what's the important (2) what was the two words that we used at the end of this=
Ian	=gold standard
Facilitator	gold standard yeah ((laughter))

Emma	list the er [gold standard] image
Marian	[gold standard]
Facilitator	you need a bit more than <u>list</u> as well
Emma	describe
Harry	state
Emma	describe
Marian	state ((laughter)
Ian	identify ((laughter))
Harry	what else is there
(2)	
Marian	is that the same as list (to Ian)
Joyce	summarise (laughter)
(5)	

<div align="right">PBL session 10</div>

Anne and Ed were both also present in this session but did not join in the right and wrong guessing game, although it is not clear why some students get involved and others do not. Anne and Ed are very quiet members of the group with fewer contributions generally than the others.

Interactional functions not identified by students but which were observed as a cause of face threat

There were interactions that were not identified or discussed by students but which were apparent on observation and were a source of face and rapport threat for the students. As such, they were generally avoided. These were handling disagreement, difference and conflict, and correcting one another and will be discussed next.

Defending own opinion

In this avoidance tactic, a student fails to defend their standpoint. Body language and wording of subsequent utterances suggest the student has not been convinced by the argument of others but that they do not want to stand their ground,

Joyce	but would we <u>necessar-</u> change the exposure factors cos <u>that</u> would just show up anyway wouldn't it with the (0.2)
Jay	[that's what I-
Pam	[no cos if she <u>has</u> got osteoporosis you] wont have a clear picture [would you?
Joyce	[that would <u>indicate</u> to us that's she's <u>got</u> it] ((facing towards right to Jay and ignoring Pam on her left who is speaking))
Joyce	[no ((Joyce turns head slightly to left towards Pam))
(0.2)	
Pam	∘it wouldn't be as clear if you've not got the right exposure factors∘ ((looking down all the time she is speaking, wearing a baseball hat, Joyce looking at Pam then facilitator))

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```
(0.5)
Joyce    but that would just be ((turns to look at Jay)) a standard exposure factor ((looks at Pam)) for
         that
Pam      °yeah (.) yeah ((looking down))
```

In this example, also discussed earlier, Pam fails to defend her argument that exposure factors need to be changed when imaging someone with osteoporosis (even though this is a correct assertion) and accepts Joyce's opinion even though Joyce has not provided any strong evidence to support her standpoint. Pam is clearly not happy with the outcome as was seen in her body language; she looks down and speaks more quietly. The preferred response, from a PBL perspective, would have been for Pam to suggest that this is an area for which none of the students have provided evidence so it needs to be taken forward as a learning objective. For a student to stand their ground or to suggest the topic needs further exploration would result in face threat to other as there is a suggestion that the other is wrong, or that they disagree with the other. Disagreements are dispreferred as they threaten face of other (Brown and Levinson, 1978) and, therefore, rapport. Although there were few instances of disagreement, in nearly all instances where these were noted, the younger student's standpoint was the one which was disregarded. Furthermore, there was a tendency for the other students to support the opinion of the older student. The resolution of the discussion exemplified above was,

```
Joyce    you wouldn't adjust the exposure factors because somebody's got oste erm osteooarthritis
         would you (0.2) cos that would just be that would [indicate =
Jay                                                         [that that's what I thought an' all
```

Jay, a mature student, has agreed with Joyce's logic rather than Pam's. There is no indication, in this passage, that this is because Joyce is a mature student, however. Later in the final focus group, Jay admits to being dismissive of the contributions of the younger students in the earlier sessions.

Requesting another student to change style of communication

This communicative interaction may be required as a result of two conditions:

a) Pragmalinguistic failure: asking another student to change their style because it is difficult to understand (e.g. choice of words, grammar and clarity as well as style issues such as accent, speed, and volume); and

b) Sociopragmatic failure: asking other students to change their style because it is prohibiting the contribution from other students and is therefore not in keeping with the developing cultural norm for the group (e.g. over-talking, having separate conversations, dominating turns).

a) Pragmalinguistic failure

There were a number of occasions when what a student said was difficult to understand because of choice of words or delivery style (discussed above in 'explaining concepts and paraphrasing'). On most of these occasions the other students failed to ask the student to repeat themselves exemplified as follows,

Ed	what does (.) collimate mean ((looking at facilitator))
(0.2)	
Den	this is ((coughs)) to (0.1) the <u>area</u> of interest where we going to capture the (0.1) the actual film say for example (0.1) a hand to that area (demos with his own hand) make sure it is on the picture you see
(3) ((Ed nods slowly but still looks puzzled))	
Facilitator	cos your beam of x-rays will cover say the whole of the table top but if you're only looking at the hand then you don't want all that ((Ed nods emphatically as if having just understood)) radiation cos of the scatter and dose to the patient so we collimate by narrowing down [the area that you're gonna irradiate
Ed	[I understand the the light? ((uses hands to mime opening up a collimator))
Facilitator	that's it (0.1) yeah

<div align="right">PBL session 2</div>

In this example, Den provides an answer to Ed's question. Den has a strong accent and he has not explained himself very well. Ed continues to look puzzled but does not ask Den to repeat himself and the facilitator has had to provide a translation. There is another occasion where Den's words are re-worded by another student,

Den	er (0.1) I <u>think</u> the lead shielding also acts as the <u>protection</u> (0.2) er in case the system (0.5)
Ian	the which, sorry (leans forwards towards Den as if to hear better))
Den	the lead shielding (0.1)
Emma	protects doesn't it ((quietly to Ian – interpreting Den's contribution))

<div align="right">PBL session 3</div>

Den	thing <u>is</u> (coughs) we are dealing with er (0.1) <u>patient</u> with (?) infection control now (I) can say that erm (coughs) each hospital (.) is likely to have the protocol or pro<u>ced</u>ures to follow especially in this case (it) is very important so technically (I feel sure) that we need to be familiar wis that you know protocols and procedures and follow it accordingly eh:: in the context of this patient
(4) ((no one agreeing confirming with Den))	
Facilitator	is that (.) being captured ((nods towards flip chart)) I can't see (.) is that (.) hospital infection control policies and procedures

<div align="right">PBL session 5</div>

The question marks in brackets are words that were difficult to understand, not as a result of quality of the video, but because Den's accent was too strong to interpret. The silence following Den's contribution and the facilitator's prompt to the group highlights the lack of acknowledgement, by the others, of the value of his contribution. This was a common feature following Den's contributions. Den's face is at risk here since he may begin to lose confidence and lose voice in the group. Indeed in the next chapter we shall see that Den contributes less frequently than any of the other students. Long term, this may impact on the interactional learning goal, since his unique perspective is not taken into consideration. If a student feels they are on the periphery of a group, there may be ramifications for group rapport. The other students are flouting their obligation to consider the sociality rights of Den to be heard. However, to raise the issue of accent and pragmalinguistic incompetence would also be to threaten his face, so this is a complex dilemma for the students.

Another student who struggled to be heard was Ed, who had a fairly strong accent but also a very quiet voice. Ed also found it difficult to explain himself because he used either too few words or too many fillers (erms, ers), as illustrated in the following extract from PBL session 9,

Ian	does anybody know anything a<u>bout</u> AECs
Ed	◦yeah it erm doesn't erm chambers erm er de<u>tect</u> each of them (.) how much (.) I think erm (0.1) you know x-ray (.) density before it cuts out (.) it has to be a<u>ligned</u> correctly it's very quite dangerous actually◦
Ian	so chambers measure the density

<div align="right">PBL session 9</div>

In the last line, Ian successfully extracts the factual detail from Ed's contribution. On other occasions, though, Ed's voice is not heard at all and so his input does not contribute to learning, as follows,

Facilitator	you push the button to make the exposure (.) but what's <u>happening</u> in the x-ray tube,
(5)	
Ed	((very quietly)) the x-rays are fired (0.3)((no-one hears him)) the x-rays are fired ((he repeats himself but no louder so he is still not heard))
Ian	do (0.2) does the erm does the current come from the (0.1) from the cathode and then spin off the anode (laughs embarrassed)

<div align="right">PBL session 2</div>

The outcome of this interaction is that another student provides the solution to the facilitator's problem, so Ed's solution is not considered.

b) Sociopragmatic failure

Sociopragmatic failure occurs when there is a mismatch between what students tacitly agree counts as appropriate communication – where their common understanding and interpretation of the meaning of communicative acts differs. So, for instance, if a student continually over-talks, they clearly believe this is appropriate communicative behaviour, but others may not believe this to be the case. This can lead to threat to the group rapport. However, addressing such difficulties will threaten the face of the student who is perceived by others to be behaving inappropriately. This is another complex area where students have to make a decision about whether to save the face of the student – thereby letting them carry on with their behaviour – or request that they change their style so that group rapport is maintained and more equitable and effective learning is ensured.

There was one mature student, Joyce, who over-talked and completed other students' statements frequently. The rest of the students tended to manage this within their own interactions with that student. In the following extract Ian is trying to make a point about postmenopausal women developing osteoporosis as a result of less oestrogen,

```
1 Ian    cos they've er =
2 Joyce  = been less mobile
3 Ian    less =
4 Joyce  =[if they'd been around and walking exercising their bones are getting stronger so the less
         mobile they are
6 Ian       [erm er:: oestrogen
7 Joyce  oestrogen as well yeah
8 Ian    and some drugs as well like steroids=
9 Joyce  =steroids
```
                                                                                    PBL session 6

Joyce tries to finish off Ian's sentences but does not always guess correctly what he is going to say (line 2). At line 7, Joyce realises that Ian is talking about oestrogen and interjects with an agreement about oestrogen. Ian tries to expand this to other drugs and, again, Joyce latches on to the new subject and completes his sentence about steroids. Ian chooses not to do the FTA of asking her to let him finish. Instead, he waits for her to finish and then picks up his thread again.

In the following passage, Laura is being talked over by Joyce. Laura continues her input,

even though Joyce is now talking, and raises her voice for the second part of her statement to be heard,

Laura   don't you think it's strange that it's it might've been cut off at the side but it's got the other one but it's not on that other image=
Joyce   =[it's
Laura   [MAYBE IT'S BECAUSE ((speaking louder to be heard over Joyce) it's
Joyce   [they may have forgot to put it on the other one
Laura   [maybe they only put it on <u>one::</u>
(0.1)
Laura   ◦ mm I don't know◦
((Laura displays frustration on her face but does not say anything))

<div align="right">PBL session 1</div>

Other students just allow Joyce to take over the turn,

Joyce   they actually look at the cardio thoracic ratio for (.) to show ((pulls facial expression to suggest not sure)) (.) I'm not quite sure er they look at the size of the heart and if it's more than half (0.1) the width ((looking at Facilitator)) er right shall I (0.1) ((looking at facilitator as if asking question of her)) demonstrate that on the= ((takes over the laptop from Jay))
Ed   =there's the previous image as well and the and the er current image cos he's had a [previous
Joyce   [right so
Ed   [oh ((stops as Joyce has taken over))
Joyce   [if we have a look at the heart it's from there to there isn't it somewhere like that but if it's more than is it more than half the cardio-thoracic ratio

<div align="right">PBL session 6</div>

In this example, Joyce initially has the floor and then, to explain further, she 'goes to the front' to use the visuals on the laptop. While she is going to the front, Ed elaborates but Joyce does not let him finish and picks up her previous statement. Ed does not return to his point, allowing Joyce to have the turn. In this move, Joyce is positioning herself as a more powerful member of the group and, by failing to address this, Ed is sanctioning her authority.

Correcting others' words

There are occasions when students try out the new discourses, but they mispronounce them. If the PBL group was working effectively as a learning community, such an error would be questioned and corrected by others in the group. Generally, this is not done. In the example below, Harry goes up to the screen to point out anatomy on an x-ray image,

Harry   erm that's the femur (.) I think it was, and if that's the front ◦I think that's the tibius there that's the fibius◦ <u>the patella's here</u> (.) and I don't know anything what's at the front ((laughs and runs back to his seat))
Facilitator do people <u>agree</u> with that
Emma   ((nods)) yeah

<div align="right">PBL session 1</div>

This example came from the brainstorming section of the trigger (stages 1-5) where students are not necessarily knowledgeable about all aspects of the trigger, and the purpose is to highlight what is not known. Harry is carrying out his role obligation to attempt to identify what is known (even though his pronunciation of the anatomy is incorrect). It is likely that the other students who have studied health on previous courses know that Harry is incorrect, and they should either correct him or suggest this is an area for further study.

Clearly, to correct someone involves an FTA as this lowers the speaker's esteem in the eyes of the others present. Failing to do this, though, results in the persistence of incorrect factual knowledge so that the interactional goal is negatively impacted upon. Again, face of other and the maintenance of group rapport is put before learning goal and thus all in the group are flouting their role obligation.

Disagreeing with another student

Occasionally, disagreements did occur but these were generally couched in language that included politeness markers or supported with a rationale for the difference in opinion. In the following extract, Pam is questioning an advert for Dr Herbs as a valid source of evidence for the success of alternative medicine,

```
1 Pam    it's it's it's gonna be ((flexes arms round back of head with face slightly down and tugs on
2         ponytail)) slightly biased though ◦isn't it ◦ they're wanting you to (0.1) go to them (.)
3         they're gonna swing it their way aren't they ◦ (1) ◦don't you think◦ (0.5) it's not (0.1)
4         gonna be(.)_as (.)((pulls down on front of jumper)) good as what you're gunna get off the
5         ((scratches her  back)) NHS (.)  direct website ◦and stuff like that◦ (.) ((looks at tutor)) I
6         don't think =
7 Jay     = well I I disagree with that  because I know erm I know one of my friends he had really:
8         bad dermatitis and went to ( ) everybody and couldn't get it sorted out and went to a
9         traditional Chinese=
10 Pam  = yeah I understand [what you're saying ((scratches brow))
11 Jay                      [you know practitioner in London and he was sorted  (0.5)
```
                                                                                    PBL session 5

Jay misinterprets Pam's criticism as being aimed at Chinese Medicine rather than at the advert as reference source. Despite the misinterpretation that underpins the difference of opinion, the two students use different rapport orientations in the disagreement. At turn 1 Pam uses an intellectual rationale related to bias and at turn 3 she persists in

expressing her difference of opinion, but lessens the blow by expressing an understanding of Jay's perspective. Jay, however, is less mitigating in his choice of language. The bald use of "don't agree" and the latching on to Pam's utterance at turn 4 to continue his line of argument demonstrates that he is less interested in maintaining rapport. This fits with Jay's opinions expressed at interview that he values the opinions of the younger students less.

Disagreement threatens other's face as it suggests they are wrong; this threatens rapport. In a group situation, it also opens up their opinion for further scrutiny by the rest. However, disagreement should foster discussion and promote critical thinking so is desirable in terms of satisfying the interactional goal of learning. In the example above, however, Pam backs down and the learning issue, one of valid reference sources, is not concluded satisfactorily. Furthermore, the other students do not join in to defend either standpoint and it is left to the facilitator to pick up on this. This exemplifies how power differentials which result in limiting the voice of some may be incongruent for effective collaborative learning in a diverse group.

Interactional functions not identified by students and not witnessed but which are expected in the process of PBL

There were two interactional functions, namely *verification of references* and *reflection on process,* which were not identified by the students and were rarely witnessed except when prompted by the facilitator. These are worthy of mentioning as they have been described as important interactions in PBL (Schmidt, 1983; Moust, van Berkel et al., 2005).

Asking for references to validate standpoint

A requirement of PBL is to validate sources of reference, especially where there are differences in opinion. There was no evidence of this taking place. It is not clear why this might be, but could relate to the notions of challenge and request which are considered to be FTAs. However, asking someone to verify their sources requires them to have noted them down and to be able to justify their appropriateness. This requires critical thinking skills, however, and these are not expected at level 4 (year one) (QAA, 2008). It is

therefore probably more likely that students did not engage in this interaction because they did not know how. This may also explain why it was not identified as a feature of PBL by the students in the initial interviews.

Reflecting on/challenging the process

A key requirement for PBL is that students reflect on their own and the group's progress in terms of learning and fulfilling group roles. Doing this requires students to be critical of themselves and others which risks threat to face and group rapport and was therefore avoided as a spontaneous act but was instigated by the facilitator. Responses from students were generally uncritical and related to the learning, rather than the way the group and/or individuals participated in the process,

Facilitator	how do you feel that went (0.1) as a group
(7)	
Facilitator	Marian=
Marian	=yeah yeah I felt that was that was good, yeah, there were some points on that that I've written on that I didn't, you know, points that I didn't make myself so that was that's good in terms of learning from each other, you know=
Emma	= it clarifies that you're [like
Joyce	[what you thinking
Emma	right, on the right, suddenly everyone else agrees with you so obviously you've learnt the right thing ((Laura nodding))

<div align="right">PBL session 2</div>

This response, instigated by the facilitator following the first PBL session, shows the students discussing the value of PBL rather than the quality of the group engagement with the process. Furthermore, on only one occasion did students attempt to reflect of their own volition. This was carried out by Jay, chair for the session. At the end of the session he says,

Jay	It's a bit <u>bitty</u>
(0.2)	
Facilitator	Yeah it's a bit bitty, we need to just (0.1) pull it together
Joyce	It's just cos I thought this objective was just discussing the difference between the cassettes rather than the actual READING of the ( ) you know ( ) so ((mumbles others hmming agreement))

<div align="right">PBL session 4</div>

Because Jay was the chair, he may perceive his criticism as being acceptable by the rest of the group since he is indirectly criticising himself. Interestingly, Joyce responds in a defensive way suggesting there was a misunderstanding in the task objective which resulted in the group learning the wrong thing. This pattern is repeated elsewhere; Jay

shows himself to be a reflective thinker, whereas Joyce always takes a defensive stance in response to his criticism, often on behalf of the group.

Facilitator	… you're doing absolutely <u>fine</u> you've got the information when I ask you questions you can follow it up (.) you're understand it but we're all a bit ((looks at her papers and hunches up suggesting they are reading from their text too much – students all nod, smile agreeing noises))
Joyce	don't forget there's a <u>lot</u> of information, with the different processors we're getting mixed up and even I was getting mixed up, there's =
Jay	that struck me as well =
Joyce	= CR and
Jay	= cos er I mean I thought that people er like you say applying the knowledge but er you know had not synthesised it and that's the next step isn't it stage 7 but I thought that if we weren't reading it (0.1) that would be the ultimate test (.) cos y'know we're <u>reading</u> it and that doesn't mean we've understood it or or that we even <u>know</u> it really

<div align="right">PBL session 4</div>

In this passage, Jay makes some useful suggestions to improve the process and the learning but Joyce appears to be blaming the volume of information the students had to cover. Jay is thus prepared to risk face threat to uphold role obligations and improve learning. Joyce is protecting her own face and that of the others. Joyce's strategy will maintain group rapport, whereas Jay's runs the risk of group rapport threat. Reflective analysis requires higher level cognitive skills. Jay held a post graduate masters degree and was an experienced teacher. Joyce, on the other hand, had educational qualifications to level 4 and had experience of only traditional, tutor-directed learning methods. However other students who held graduate qualifications failed to reflect critically on group/self performance. It is clear that willingness to risk face threat varies with each student. This appears to be based on the importance they attribute to the interactional goal, what they believe the goal to be, and the confidence they have in upholding their own face when it is at risk of threat. However, this section reports the group as unit of analysis and the effect on the individual will be reported later in section iv).

Interactional functions which were identified by students and shown to be rapport-enhancing

The remaining interaction identified by the students was "sharing". As identified in section i) of the results, not all interactional functions were considered to be face-threatening. Indeed sharing was face-enhancing and was favoured by the students since it was the most frequently observed.

Sharing is a difficult concept to capture in observation. Analysis of how students talked about sharing suggested that they were referring to sharing both i) learning issues specifically and ii) the learning experience of being in this group more generally. The sharing of learning issues was difficult to observe, as this manifested in students jotting down additional personal notes. However, the act of doing this was mentioned by some of the students in their interviews, and was implied in interactions such as agreeing/echoing/confirming, i.e. process referred to by Mercer as cumulative reasoning (Mercer, 1996). Other interpretations of *sharing* related to shared experiences and the development of a common bond. This became more apparent following common experiences such as clinical learning. I come back to this later in the section.

Agreeing/echoing/confirming

Facilitator (2)	ok (.) overall what have we <u>seen</u> images of what (.) what have we recognised so far
Harry	erm x-ray [machines
( )	[x-ray machines
Facilitator	ok the x-ray machine
Harry	power supply
Facilitator	power supply=
Harry	=control panel=
Marian	=control panel
Den	=control panel=
Ian	chest=
Harry	=and the arm=
Marian	=chest like the chest=
Joyce	=chest stand=
Marian	=yeah=
Emma	=back of the like the tube thing the cables
Den	=the arm

PBL session 2

Here we can see the students supporting one another's answers through the use of repetition or echoing, and markers such as 'yeah'. Notice the latching symbol ('=') which shows that this was a rapid response sequence with each utterance triggering off another. Indeed, it was difficult to be sure which student was speaking on occasions. Agreeing with another student serves a number of win-win functions as a RM strategy. It enhances self face as it demonstrates that the student has also arrived at the same level of conceptual understanding as the rest of their peers – they have done the work and they have understood the learning issue. It does not put any demand on self face since, in agreeing with someone else, another person has made the first move and risked being

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wrong. If a student sees they have the same understanding/belief/facts as another student then the likelihood is that this learning is correct so the risk of making an error is lessened. In addition, by making the utterance, even though it is low risk and on the back of someone else's attempt, a student satisfies their obligation as a PBL group member to contribute. Furthermore, agreement is rapport-enhancing which supports and engenders good feeling in others to support future interactions. It is not surprising that the use of agreement/echoing/confirmation is the utterance which is most common in the group. For five students, it was the most common strategy used and it was particularly prevalent in the older student utterances.

Sharing and reflecting on personal experiences and perspectives

Some students shared personal anecdotes in their learning interactions. For example, in PBL session 4, the students have been presented with a scenario in which the patient has rheumatoid arthritis and they are discussing how mobile the patient will be. Pam says,

"She wont be very good at walking like my grandma's got rheumatoid and she cant walk very far but she is mobile, you know like she has difficulty moving but she can move"

PBL Session 4

Such strategies help students to link new learning to current mental schema. However, unlike the linking of new learning to previous subject knowledge, which was not favoured by these students, linking to personal experiences requires less face threat since personal experience can not be contradicted. Furthermore, in sharing personal experiences the students are demonstrating an attempt to reduce the social distance and thus facilitate a rapport-enhancing orientation.

Miller (1994) suggests that such storytelling is an important feature in socialisation as it enables self-construction and identity formation, she even goes on to suggest it is the major mechanism of socialisation. For instance, this group now share a common understanding about one element of Pam's personal life. The more the students are prepared to share their life histories the closer they will become and this reduction in social distance, according to the politeness literature, is likely to reduce the impact of FTAs.

Yet, not all students engaged in this level of disclosure. Clearly, there is a difference in the individual student's preparedness to share and become close which may be due to cultural and social differences (Miller, 1994). For instance, because story-telling is prevalent in young children who are learning to construct their identities the younger students may find this an easier task. Pam and Laura were certainly observed more frequently sharing personal histories in this way. A preference for older students to remain impersonal was also identified by Jay in his interview,

> *"I think this course is geared towards, well not necessarily, but it attracts mature people, mature students and some of them for whatever reasons don't particularly want to engage on a personal level, it's strictly professional and that's fine there's not a problem with that"*
>
> *Jay interview 1*

Sharing practice-based experiences

Just like the personal anecdotes, anecdotes related to clinical practice have the function of creating a shared space where the experience of joining a new discipline and using new discourses creates a common ground for learning. In sharing these experiences, and in using the discourses, social distance has the potential to diminish. In PBL 9, which is in semester two, Ed is able to competently use the discourses students struggled with in semester one. His use of these words requires no interpretation or explanation since, not only have they become the discourses of his practice, but they are those of his peers to whom he is talking,

> *"I did er chest x-ray on a patient end erm er he required a lateral as well and the er radiographer came in and asked me if I'd used the bucky before and I said no so she helped me and er she increased the erm the er kV by 10 and er doubled the mAs you know the first one I did was just a normal PA one erm on the cassette you know with no bucky erm er then she used the bucky and she increased it by 10 kV and er doubled the mAs"*
>
> *Ed PBL Session 9*

The subsequent discussion was an animated series of interactions asking Ed what happened next and relating his experiences back to the theory that they had just been covering.

All students, no matter what identity they bring to the PBL group, are sharing the experience of becoming a radiographer and this has the potential to bridge the gap that exists as a result of demographic distance. As Den says in his interview,

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"The common thing I have is I'm a student like the others so we are all in the same boat. We start together we're doing the same course and all the rest of it. So I feel on sort of on equal footing on those terms with them".

Den interview 1

As might be expected, there is an increasing reference to practice-based anecdote as students progress on the course, with 19, 10, 28, and 51 references in PBL sessions 2, 4, 5, and 9 respectively. Furthermore, these students had experienced a clinical learning block of 7 weeks between sessions 5 and 9. If such discussions can bridge the social and cultural gap then facilitators could take advantage of this by encouraging sharing of stories as early as is practical. This opportunity may not be available to disciplines where there is no clinical or work-based component, or where the community of practice is less clearly defined.

Summary

I have shown that some face-threatening interactions clearly exist in the PBL learning context. These can be classed as threat to self, other or both. Students in this group appear to prefer interactional strategies which avoid face threat to self and others, but will threaten own face before others. When own face is threatened they apply strategies of self-effacement and modesty.

A range of approaches to reduce face threat have been observed. Some students avoid the threat altogether by failing to engage in certain interactions. In particular, contributing voluntarily to feedback was difficult. This is not what is expected of level 4 study since feeding back work in a didactic manner is not a high order cognitive skill. It appears that the social impact of group learning throws a new dimension on the traditionally held taxonomies of learning. Nevertheless, demands on the higher order cognitive skills such as synthesis of discussion, which are not usually expected at level 4 but which are a feature of PBL, were attempted by students and it is proposed this is as a result them being embedded within the procedural instructions for PBL used by these students.

Where students attempted FTAs, they tended to use mitigation to manage rapport. Approaches differed from student to student in this regard with some applying association-involvement and others association-detachment strategies. This may be as a

result of differences in cultural background, as there were some features common to eastern students and others common to younger students. There were also differences between students of the same cultural backgrounds, however, which suggest personality traits may have also played a role but this was not explored in this study.

Diversity in approach appears to have the potential for a lack of understanding between students, resulting in a developing inequity in student position; some students did appear to be subordinated. Importantly, in this group, diversity also appears to have been responsible for a prevalence of the equity – autonomy SIP. The problem with autonomy as an overriding strategy is that students have a tendency to avoid FTAs that are essential for learning. The next section will provide quantitative evidence to determine if this was the case.

Section iv) Consequences

Learning goals achieved by the group and individuals

Introduction to the section

The previous chapters have outlined i) the students' perspectives of the PBL process, ii) the diverse features of the group, and iii) the strategies used to manage difficult interactions. In the previous chapter section we saw how this manifests in the students' communication strategies. We observed that, as a consequence, some types of learning interactions, i.e. those associated with high face threat, appeared not to take place. The next section will provide quantitative data to determine if this was the case.

First I will present the coding scheme created for the types of learning interactions observed over the whole set of video footage. Classification of these interactions into high cognitive level versus low cognitive level, and high rapport threat versus low rapport threat, will then be presented so that a thorough analysis of which types of interactions were most common for this group can be made.

Coding all interactions according to cognitive descriptors

All 10 PBL sessions were first reviewed and 24 types of interactions related to learning were identified.

Because the research was concerned with the way cultural diversity impacted on the communicative interactions within the group, utterances at the group level were the unit of analysis and therefore the coding units were at the episodic level. This meant that coding could have been assigned to a single utterance from one individual, or to several consecutive utterances making up a number of learning interactions between two or more students. I have called these *cognitive interactions* and the final list of cognitive interactions is tabulated with illustrations in figure 13.

Cognitive interaction	Description	Example
Reflecting on group process	Reflecting on their own or the group's performance in the session	"basically we're just showing that we're all unsure aren't we (laughs) of what we're saying" Joyce PBL 4 end of stage 7
Postulating during brainstorm (PBL stages 1-5)	Attempting a conclusion or hypothesis based on prior information or knowledge	"like they could be like the voltage cables that's what I think and that's like everything but erm image one could be like that part" Emma PBL 2 stage 3
Elaborating explaining	Building on a previous input by explaining it – includes explanatory conjunctions such as 'because'	"as the photons pass through like some of them are absorbed which is what that produces and ones that aren't absorbed are what make it darker on that side whereas is if it's over exposed like too many go through an you don't get a clear image (waves hands and smiles) you know what I mean" Laura PBL 2 stage 7
Application to/of previous knowledge	Applying the new information to a mental model they already have related to that concept	"osteoarthritis which is probably what you would be looking for on this would show the wearing away of the hyaline cartilage on the joints so.." Joyce PBL 4 stage 3
Challenging	Questioning the accuracy/voracity of the previous statement	"oh I had that the other way round the higher the kVp you've got the higher the density"(looks through notes) Ian PBL 2 stage 7
Defending	Defending a statement following a challenge or contradiction	"well I don't agree with that cos I know one of my friends had dermatitis and went to everybody and couldn't get it sorted out and went to a traditional Chinese..." Jay PBL 5 stage 7
Suggesting learning activities	Making suggestions about the desired group learning outcomes and activities. Includes problem solving suggestions e.g. "if we do x then we might find y"	"we need to like find out what the image one and two are cos we don't know what it is" Emma PBL 2 stage 4
Postulating solutions during stage 7 feedback	Attempting a conclusion or hypothesis based on the reading and learning that has been undertaken at stage 6 (independent study)	"yeah I think the electrons get trapped in the phosphor layer er er and that contains erm fluorohalide as well and the electron trap prevent electrons returning to their ground state er this way they store information by staying where they are" Ian PBL 4 stage 7
Proffering alternative opinion	Suggesting an alternative perspective to a perspective that has just been proposed	"does that mean she's had no, has she not just had previous imaging on the knee, could she have had it like" Pam PBL 4 stage 7
Reflecting on own knowledge	Reflecting on their own knowledge	"I don't really know how to do some of those equations like one to do with the attenuation coefficient" Ian PBL 9 stage 7
Verifying sources	Defending a standpoint by citing reference source	"I think I might have got that from the notes off the powerpoint (laughs, Jay laughs), but I er looked at a few other things. I looked at er medcyclopaedia"

		Ian PBL 4 stage 7
Stating first/starting off	Starting the feedback by reading out facts without proactively eliciting further questioning or input	*"I've got it's the ability of the x-ray film to define an edge"(reading out definition)* Laura PBL 2 stage 7
Correcting	Correcting another student's factual error	Joyce: *is it for mannography to get (quiet mumble)* Marian: *"yeah yeah mammography yeah"* PBL 4 stage 7
Re-questioning	Asking the same question again e.g. when previous answer is unsatisfactory	Joyce: *"is it 7 years 7 years"* Anne: *"8 years"* Joyce: *"is it 8 years"* PBL 5 stage 7 (regarding legal requirement *for* storage of images*)*
Contradicting	stating alternate or opposite fact without explanation or justification	*"I've a feeling it's mAs you know"* Ed PBL 9 stage 3
Paraphrasing	paraphrasing facts without proactively eliciting further questioning or input	*"I just got well erm I just got like 4 kinds of main headings for like what all your responsibilities come under and stuff like that the first one's like taking care of the patient during after and before…"* Pam PBL 5 stage 7
Summarising	bringing together the discussion, outlining key points, regarding the topics they have covered (not a reflection of the performance which would be coded under 'reflection')	*"right, ok so there's erm certain themes coming out here"* Jay PBL 4 stage 5
Re-wording same facts	Repeating someone else's statement in own words but without adding further information or explanation	Laura: *"I think it's because when it's a bigger grain you have like a bigger screen and its higher up and all so it spreads out more"* Joyce : *"so it'll be less sharp won't it the bigger the grains the less sharp"* PBL 4 stage 7
Adding facts	adding further information to a previous answer but does not change or explain it – merely builds on it by adding more facts	Ian: *"er and they like cross over each other to stabilise the knee front to back"* (2) Den: *"well er the cruciate there's two aren't they the anterior and the posterior"* PBL 2 stage 7
Application to personal life (anecdote)	Applying the new information to practical applications	*"she wont be very good at walking like my grandma's got rheumatoid and she can't walk very far but she is mobile…"* Pam PBL 4 Stage 3
Questioning seeking clarification	Asking others for clarification about learning issue	*"and is the this position like always supine"* Ian PBL 2 before start of session
Answering clarifying	re-stating following request for clarity	Ian: *"are they called the collateral ligaments do people know that or is it just the site that I was looking at that calls them that"* (8) Marian: *"I've got them down as that"* PBL 2 stage 7
Agreeing echoing confirming	Agreeing with previous statement so as to add strength to voracity of statement	*"yeah yeah that makes sense now"* Joyce PBL 2 stage 7
Application/exemplifying	Applying the new information to	*"sorry I was just thinking like for a chest x-ray you*

to practice (anecdote)	clinical practice, may also be personal anecdote of practice experience	*might get a small lady but she might have a large chest"* Marian PBL 9 stage 7

Reliability of Coding

A second reviewer, a Professor of Radiography Education, coded a proportion of one transcript (85 interactions) to determine whether the descriptors were reliable and to change any ambiguous or redundant categories. He was asked to code the data according to the descriptors and then we discussed interactions where we had not reached consensus. This enabled the descriptors to be adapted for clarity. After conducting this exercise, the value of viewing video data became clear, as a number of disagreements between our categories were as a result of him only viewing the transcript. For instance, when a student explained a concept it was only possible to differentiate 'paraphrasing' from 'reading out' from a pre-prepared text by viewing the video. For this reason a kappa correlation of our reports was not conducted as the viewing conditions were too inconsistent to yield valid results. However, the discussion enabled clarification of ambiguous categories.

Detailed Coding

After all videos had been scrutinised to identify cognitive interactions, PBL sessions 2, 4, 5 and 9 were then coded in detail. Every student learning utterance in each of these sessions was allocated to one of the categories listed in figure 13. For ease of analysis, the body of literature on taxonomies of learning was then reviewed to categorise each of these learning interactions into high or low cognitive level (figure 14). Taxonomies of learning categorise student learning. According to Atherton (2010) the originators were Bloom et al who devised taxonomies for cognitive, affective and psychomotor learning domains. The cognitive domain is the one most commonly used and is the one which is relevant here. Other cognitive learning models have since been devised (SÄLJÖ, 1979) but all have similar principles. They start from the premise that a learner moves through hierarchical stages, each being a pre-requisite for the next. The most basic stage of learning is acquisition and recounting of facts, then comes a comprehension of these facts such that they can be explained to others. More advanced learning enables

application of the knowledge to other contexts. This is followed by a critical evaluative approach to the learned knowledge and then a synthesis of a range of topics to develop new ideas. Ultimately, comes a mastery that enables new knowledge within the field to be created. Authors have argued about the order of some of these stages especially the later ones. However there is a general agreement about those at the bottom of the hierarchy (Atherton, 2010). For the purposes of this study I am only interested in the distinction between the first two stages combined, and the rest. This is because the study group comprises level 4 students, as defined by the UK QAA FEHE levels (QAA, 2008) so it is the first two stages within which they are expected to be operating. Thus, ordering the observed learning interactions into high and low cognitive levels using these taxonomies provided the following distinctions:

High cognitive learning interaction (above HE Level 4 (QAA, 2008))	Low cognitive learning interaction (expected at HE level 4 (QAA, 2008))
Reflecting on group process Reflecting on own knowledge at end of session Postulating solutions (during brainstorming) Postulating solutions at stage 7 Elaborating/explaining Application to/of previous knowledge Defending Challenging Suggesting learning activities Proffering an alternative opinion Verifying sources	Stating facts Re-wording same facts Correcting (an incorrectly stated fact) Re-questioning Contradicting Paraphrasing Summarising Adding facts Application to personal life (anecdote) Questioning- seeking clarification Answering/clarifying Agreeing/echoing/confirming Application to practice (anecdote)

Figure 14: Cognitive interactions categorised as high or low order

The number of interactions in each of the two categories was recorded for each of the four detailed weeks of analysis and is presented in figure 15. Students mainly demonstrated learning interactions in the lower cognitive categories. 70% of interactions were in this category at the beginning of the year and 64% at the end of the study. There was, therefore, no significant change in the cognitive level of interactions over the period of the study. PBL session 4 had the highest number of higher level interactions at just under 40%. This is the session where all students were present.

There is no other study group to which this level of interaction may be compared. However, this is a level four group so the fact that they demonstrated learning interactions above this level at all is perhaps worthy of note.
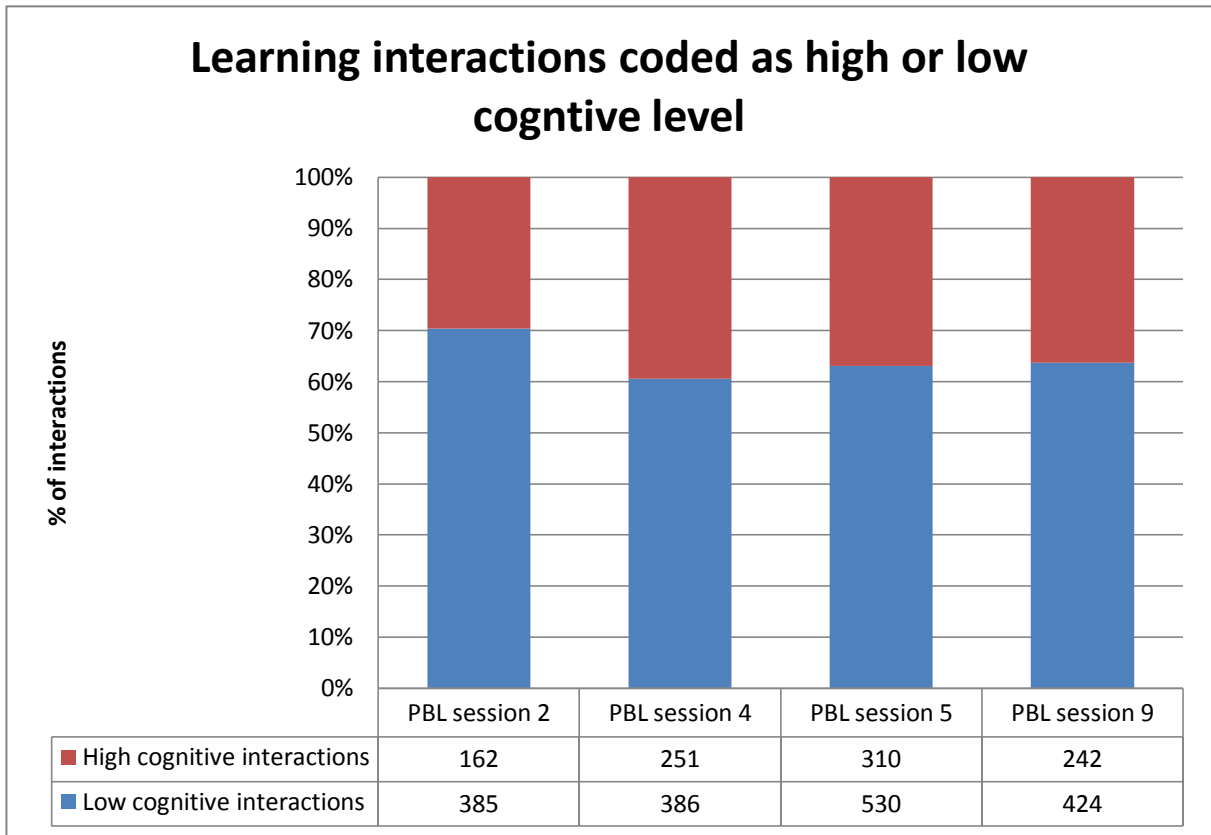

Figure 15: High and low cognitive interactions across the time span of the study

Many of the higher cognitive learning interactions are also high rapport- or face-threat interactions and I propose that this is a key barrier to the students progressing further. In order to analyse this assumption the high and low cognitive interactions need to be broken down further into high and low face threat.

Re-coding all interactions according to face threat categories

The list of 24 learning interactions were re-classified into high and low face threat. In order to make this distinction, video and interview data were analysed to identify those learning interactions that students said or suggested they avoided due to fear of face threat to self or other. Observational analysis of video data also highlighted instances of avoidance or the use of mitigating tactics which helped to identify and/or confirm

uncomfortable learning interactions. These have been extensively reported and illustrated in previous sections of this results chapter and tabulated in figure 16. Thus, learning interactions could also be categorised as likely to cause face threat, or to have no or low face threat. In coding this way, some interactions, which, according to Bloom and others would have been classed as low cognitive level and therefore easier to carry out, are reconstructed as difficult from a social learning perspective. These include: stating facts (being the first in the group to do so for each new topic), correcting an incorrect fact made by another, re-questioning, contradicting, paraphrasing and summarising. Some higher cognitive learning interactions have also been down-graded as easier to perform from a social learning perspective, and these are: reflecting on oneself and verifying sources of information.

High Face Threat Interactions	Reflecting on group process Postulating solutions (during brainstorming) Elaborating/explaining Application to/of previous knowledge Defending Challenging Suggesting learning activities Postulating solutions at stage 7 (feedback) Proffering an alternative opinion Stating first Correcting (an incorrectly stated fact) Re-questioning Contradicting Paraphrasing Summarising
Low Face Threat Interactions	Reflecting on own knowledge at end of session Verifying sources Re-wording same facts Adding facts Application to personal life (anecdote) Questioning- seeking clarification Answering/clarifying Agreeing/echoing/confirming Application to practice (anecdote)

Figure 16: Learning interactions re-categorised into high and low face threat interactions

The number of interactions in each of the two categories was recorded for each of the four detailed weeks of analysis and is presented in figure 17. Students mainly demonstrated learning interactions in the low face threat category. The percentage of low face-threatening interactions was greatest in session 2, at 70%. This figure dropped to 60% in session 4 and rose again to approximately 65% at the end of the year (session 9). In

summary, students tended to favour low face-threatening interactions and this did not change throughout the period of the study. This supports the notion that students in this group continued to find it difficult to engage in interactions which would threaten face and therefore put group rapport before learning goals.
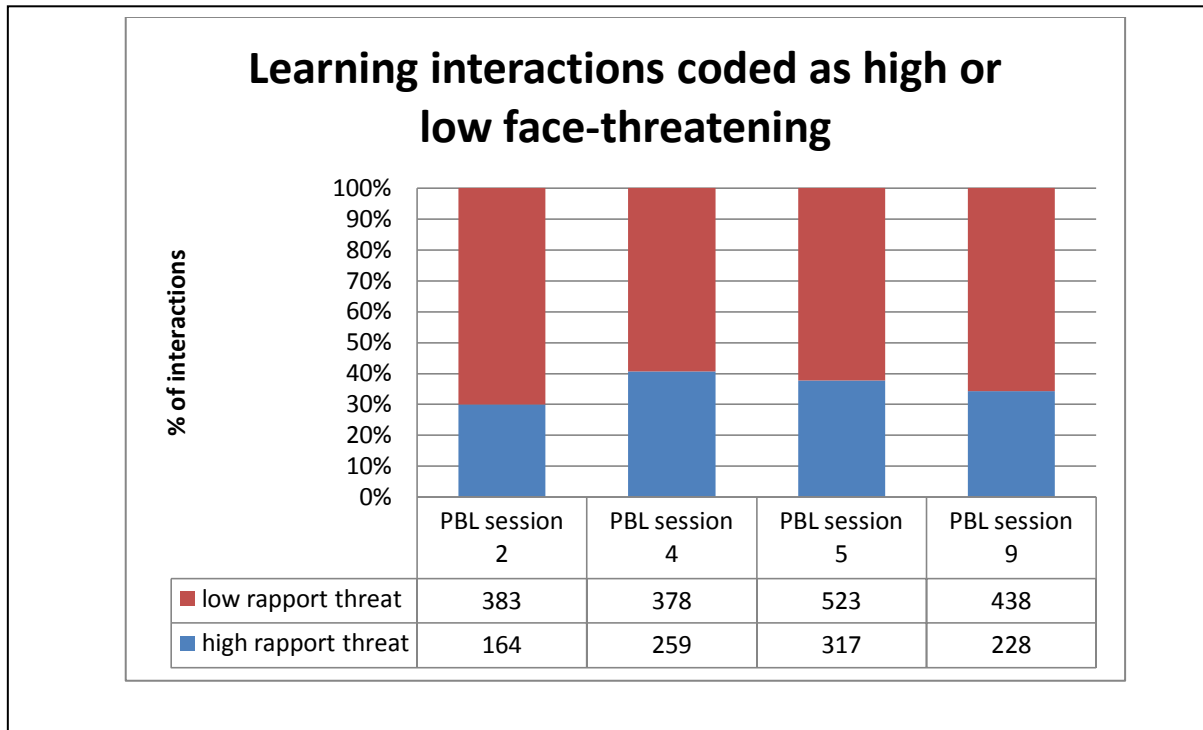
Learning interactions coded as high or low face-threatening

	PBL session 2	PBL session 4	PBL session 5	PBL session 9
low rapport threat	383	378	523	438
high rapport threat	164	259	317	228

y-axis: % of interactions, scaled 0% to 100%

Figure 17: High and low face threat interactions across the time span of the study

Having categorised interactions in two ways, i.e. as either high cognitive level (HC) or low cognitive level (LC), and high face threat (HFT) or low face threat (LFT), it is possible to construct a 2 x 2 model to further categorise the types of interactions to consider these two constructs in an integrated way, shown in figure 18:

	High Cognitive	Low Cognitive
High Face Threat	*Interactions that are difficult as they are rapport-threatening but students may also not know how to do these or even know that they should be done. Requires tutor support to develop cognitive level and opportunities to reduce social and power distances in group* **(HC/HFT)** Reflecting on group process Postulating solutions (during brainstorming) Elaborating/explaining Application to/of previous knowledge Defending Challenging Suggesting learning activities Postulating solutions at stage 7 (feedback) Proffering an alternative opinion	*Interactions that are difficult as they are rapport-threatening although students should have the cognitive ability to engage in these. Requires tutor support to develop opportunities to reduce social and power distances in group.* *Diverse groups of students with large social distances may still find this difficult.* **(LC/HFT)** Stating first Correcting (an incorrectly stated fact) Re-questioning Contradicting Paraphrasing Summarising
Low Face Threat	*Interactions which are favoured in terms of enhancing or maintaining rapport but they need some cognitive development. Requires tutor support to develop cognitive level* **(HC/LFT)** Reflecting on own knowledge at end of session Verifying sources	*Interactions students should find easiest in terms of enhancing or maintaining rapport and cognitive demands. Diverse groups may find it difficult to move out of this quadrant.* **(LC/LFT)** Re-wording same facts Adding facts Application to personal life (anecdote) Questioning- seeking clarification Answering/clarifying Agreeing/echoing/confirming Application to practice (anecdote)

Figure 18: Learning interactions re-categorised into high and low face threat and high and low cognitive level

The group learning interactions were then re-categorised according to the four quadrants: HFT/HC, HFT/LC, LFT/HC, LFT/LC and the proportion of these for each of the four PBL sessions is presented in the following pie charts, figures 19-22:
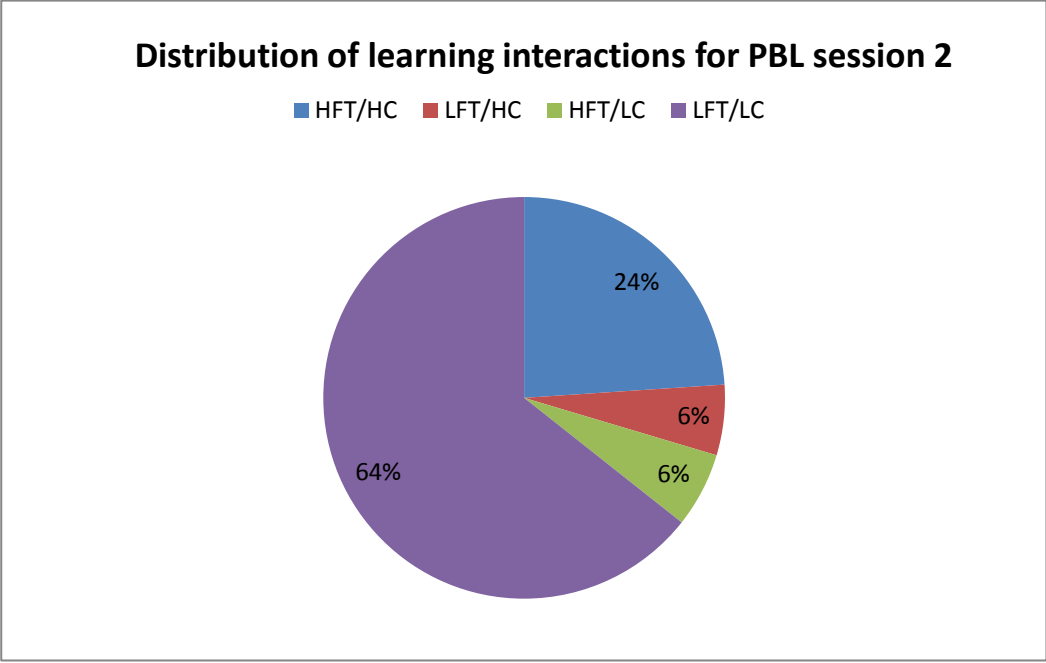
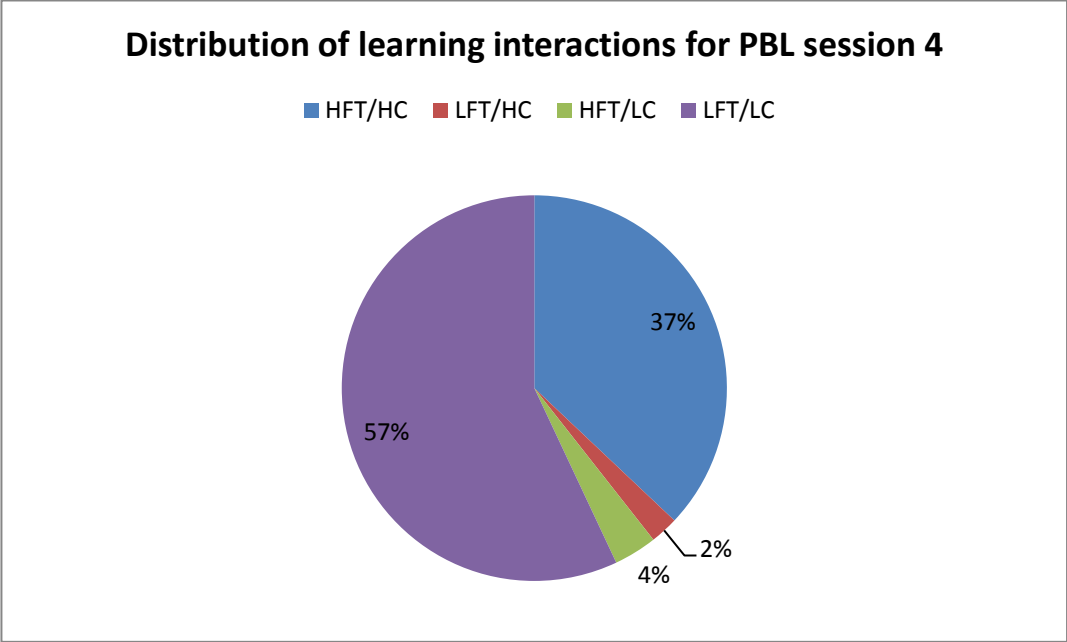**Figure 19: Distribution of the learning interactions PBL session 2**

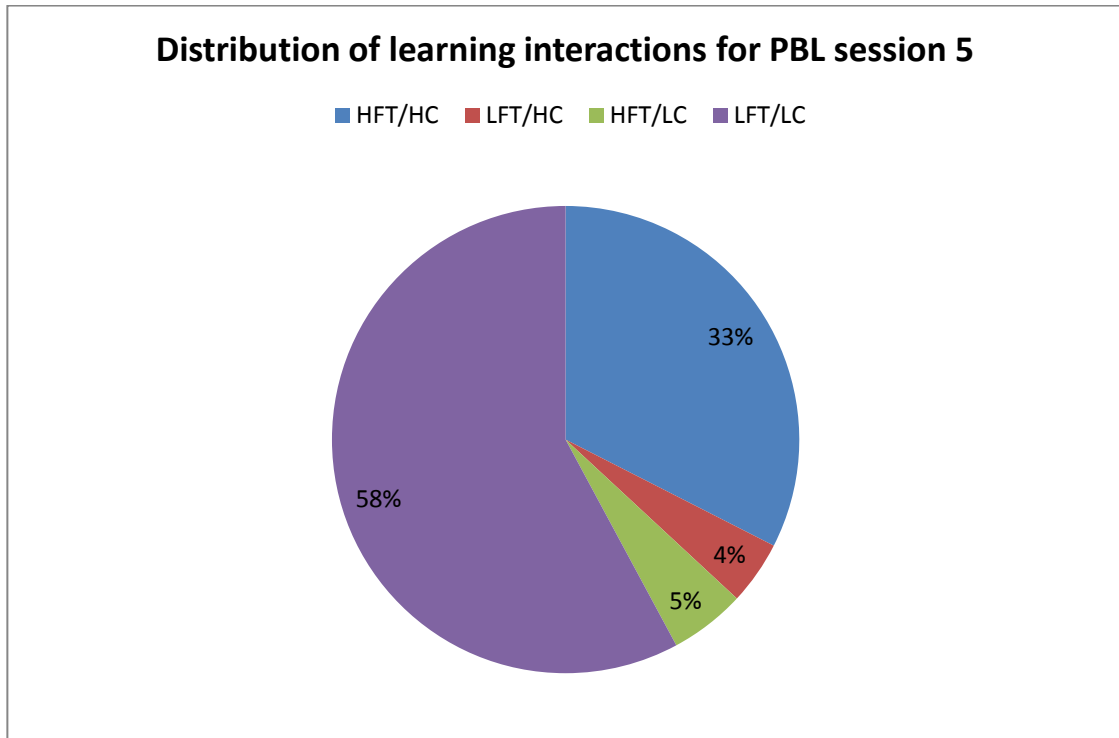**Figure 20: Distribution of the learning interactions PBL session 4**

Distribution of learning interactions for PBL session 5

HFT/HC ■ LFT/HC ■ HFT/LC ■ LFT/LC

33%

4%

5%

58%

Figure 21: Distribution of the learning interactions PBL session 5

Distribution of learning interactions for PBL session 9

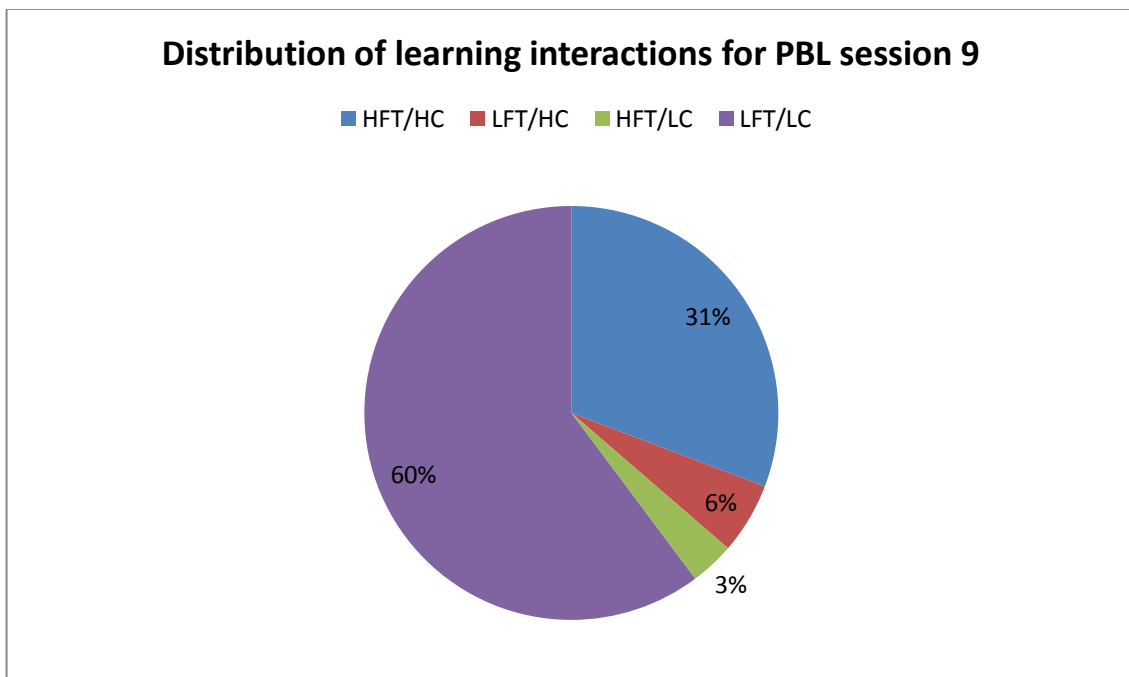HFT/HC ■ LFT/HC ■ HFT/LC ■ LFT/LC

31%

6%

3%

60%

Figure 22: Distribution of the learning interactions PBL session 9

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The data shows that students engaged in the LFT/LC quadrant of the model for approximately 60% of the time. This did not significantly change over the period of the study. Students did engage in High Face Threat interactions, however, and the majority of these are in the HC quadrant of the model. HFT/LC and LFT/HC were the least frequently observed interactions ranging between 3% to 6% and 2% to 6% respectively. Figure 23 provides a detailed breakdown of each of the learning interactions over the four weeks. It shows that the HFT/HC interactions most frequently observed were those associated with the PBL process, which included brainstorming and setting objectives. Learning interactions less frequently observed were those which would threaten others' face. These fall into both high and low cognitive categories. For example, HFT/HC interactions which threaten others' face are 'challenging' and 'reflecting on group performance'. HFT/LC which threaten others' face include 'contradicting', 'correcting' and 'stating', amongst others. These are very infrequently observed. Students in this group are therefore more likely to engage in high threat interactions where they are required to do so to follow the stages of PBL or where the threat is to self rather than other.

Summary

The assumptions being explored were:

- That the cognitive level of interactions would increase over the year
- That students would initially be reluctant to engage in learning interactions which threaten the face. However as social distance diminished, and as they began to feel secure in their relationships and in their own confidence, they would have engaged in more FTAs

These assumptions were not borne out in the descriptive statistics. The focus of this study however was the impact of diversity on group communication and learning. The above assumptions were therefore complicated by this contextual variable. It is argued that for this diverse group, socialisation was minimal. Thus social distance was maintained and interactions which threatened face remained high in risk.

A key assumption for this study then was that:

- Interactions which threaten face (self or other face threat) would be less frequently observed than those which did not, and that this would not change over the period of the study since the social distance between individuals was not likely to significantly change.

The quantitative data would appear to support this assumption. In addition, the data suggests that students were more likely to engage in face-threatening interactions which were driven into the procedural processes of PBL. This illustrates the strong influence such rules and processes have for legitimising and encouraging the engagement in FTAs, especially for this group.

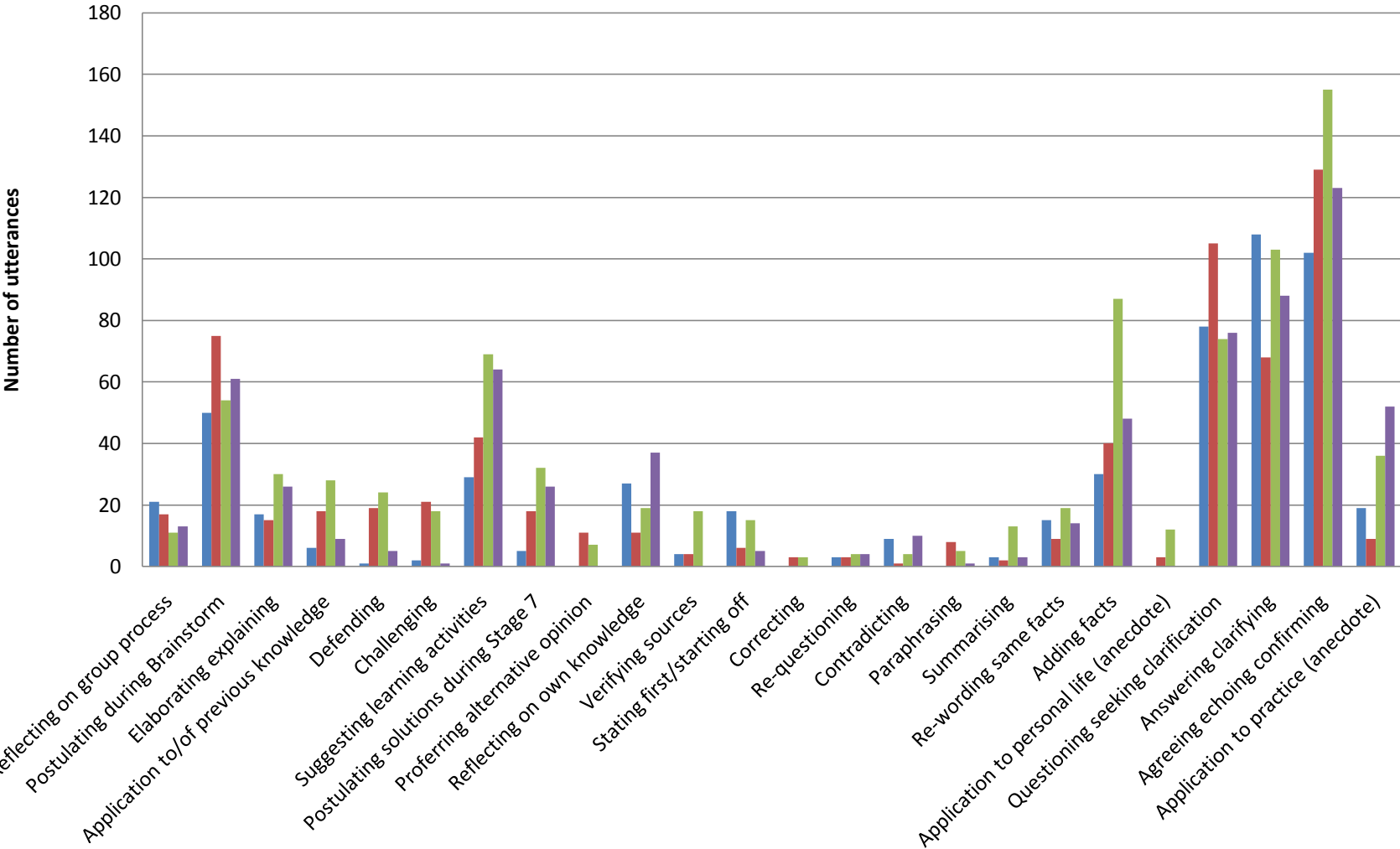**Learning interactions observed weeks 2, 4, 5 & 9**

Individual Student as Unit of Analysis

Data has so far been presented for the whole group. Evaluation at the individual student level may provide evidence that observations regarding communication failure, identified in section 3, could have resulted in inhibiting some students from participating.

Figure 24 details participation of each student across the period of time of the study in terms of number of utterances. Because not all students were present for all sessions, and because not all sessions elicited the same number of utterances in total, mean numbers of utterances per session per student are presented in the bottom row of the table.

The table shows that the students varied greatly in their level of participation. Jay had 221.75 utterances per session (ranked 1 in terms of highest number) compared to Den who had 40.12 utterances per session (ranked 11). Overall there appear to be two students who dominate the discussion. These are Jay and Joyce, who are both mature students. However, Emma, who is ranked third, is a younger student. The three students who participate least are Laura, Anne and Den, each with less than 50 utterances. In this lower participation group there is both younger and older representation. In terms of ethnicity, students educated in both eastern and western cultures are represented in each of the higher and lower participation groups. There is therefore no clear pattern to suggest that participation is influenced by age or ethnicity. In terms of educational background, Jay and Den are both educated to degree level which, again, suggests there is no strong association between number of utterances and educational qualification.

Of interest to this study is whether there is a tendency for students from diverse backgrounds to avoid face-threatening interactions. In order to determine if this is the case in this group, each student's interactions were analysed. The same 4 detailed session analyses were used (i.e. sessions 2, 4, 5 and 9). Charts which illustrate the participation of each student are provided on pages 153-168 (figures 25-35).

	Ian	Joyce	Jay	Laura	Harry	Anne	Pam	Ed	Den	Emma	Marian	Facilitator	Total no utterances	Mean utterances per person
PBL1	**100**	71		62	33	42			49	79	**90**	194	720	80
Rank	*1*	*4*		*5*	*8*	*7*			*6*	*3*	*2*			
PBL2	**118**	121		38	34	53		**66**	52	126	**87**	235	930	93
Rank	*3*	*2*		*8*	*9*	*6*		*5*	*7*	*1*	*4*			
PBL3	**90**	96		22	23	42		**66**	33	**86**	42	177	677	67.7
Rank	*2*	*1*		*9*	*8*	*5*		*4*	*7*	*3*	*5*			
PBL4	48	146	**188**	55	18	19	62	**100**	35	52	37	182	942	78.5
Rank	*7*	*2*	*1*	*5*	*11*	*10*	*4*	*3*	*9*	*6*	*8*			
PBL5	64	168	**307**	29	**73**	35	98	40	56	**187**		219	1276	116
Rank	*6*	*3*	*1*	*10*	*5*	*8*	*9*	*8*	*7*	*2*				
PBL6	58	**228**	223		**138**	51		43	38		59	186	1024	113.7
Rank	*5*	*1*	*2*		*3*	*6*		*7*	*8*		*4*			
PBL7	37	81	169		**32**	**78**	105	14	49	54	**104**	238	961	87.3
Rank	*8*	*4*	*1*		*9*	*5*	*2*	*10*	*7*	*6*	*3*			
PBL8	13	19			2	8	34		9	13	5	68	171	19
Rank	*3*	*2*			*7*	*5*	*1*		*4*	*3*	*6*			
PBL9	**147**	263				80		84		**159**	110	172	1015	145
Rank	*3*	*1*				*6*		*5*		*2*	*4*			
PBL10	42	**228**			**119**	51		33		**151**	108	119	851	106.4
Rank	*6*	*1*			*3*	*5*		*7*		*2*	*4*			
Total												1790	8567	
Mean uttrances /session	71.7	142.1	221.75	41.2	52.4	45.9	74.75	55.75	40.12	100.7	71.3	179	856.7	
Rank	5	2	1	10	8	9	4	7	11	3	6		17134	

Figure 24: Analysis of number of utterances per student per session

(Entries in bold indicate student is chairing or scribing that week)
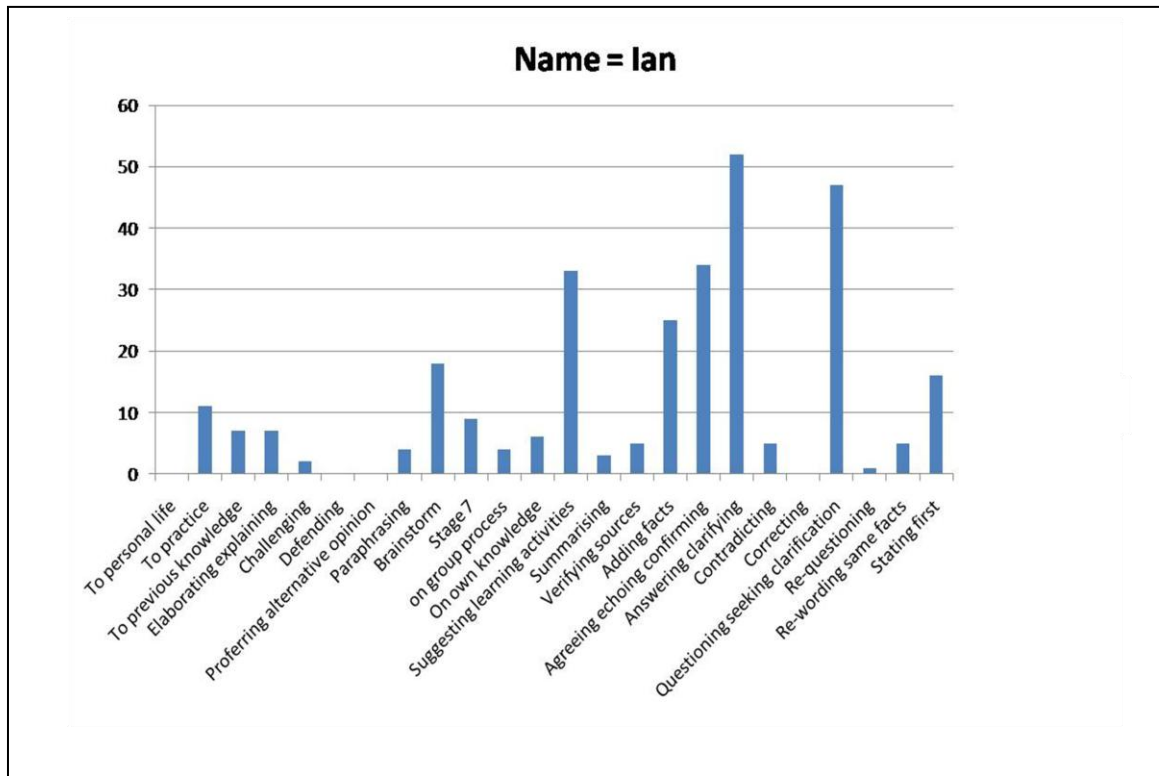
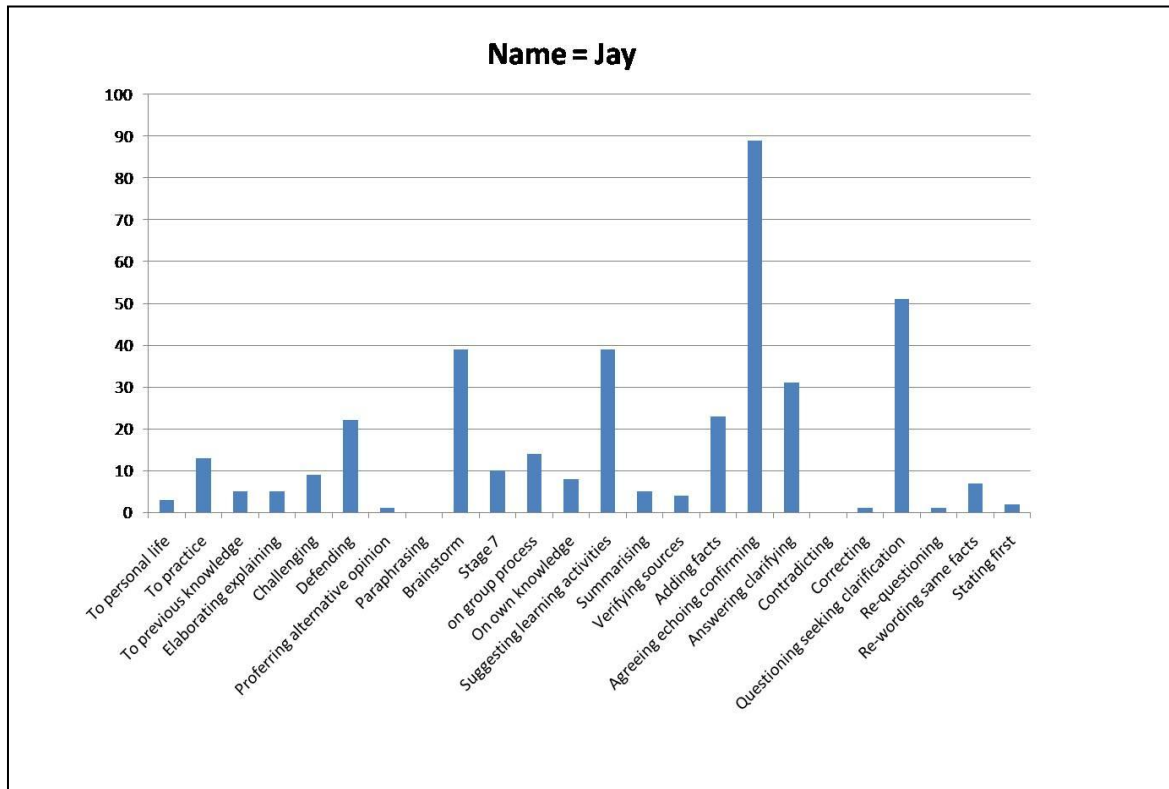Figure 25: Ian's participation weeks 2, 4, 5 & 9 combined

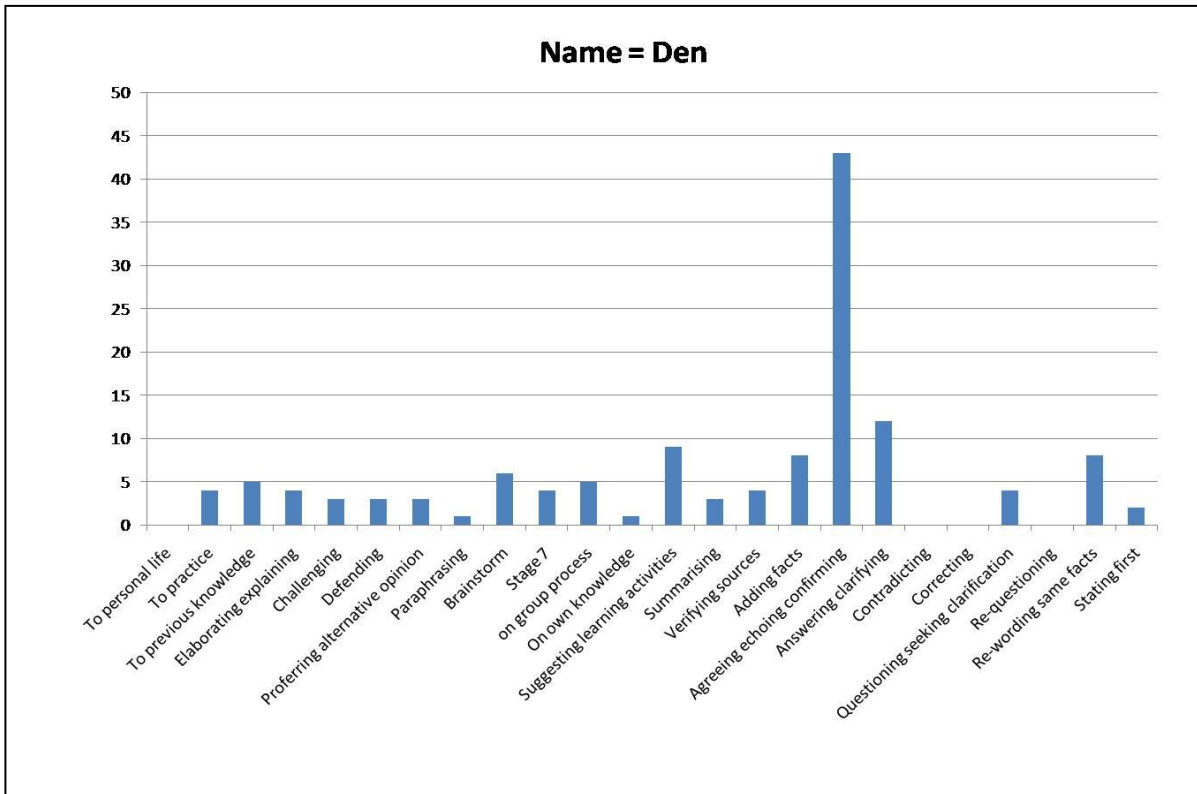Figure 26: Jay's participation weeks 2, 4, 5 & 9 combined

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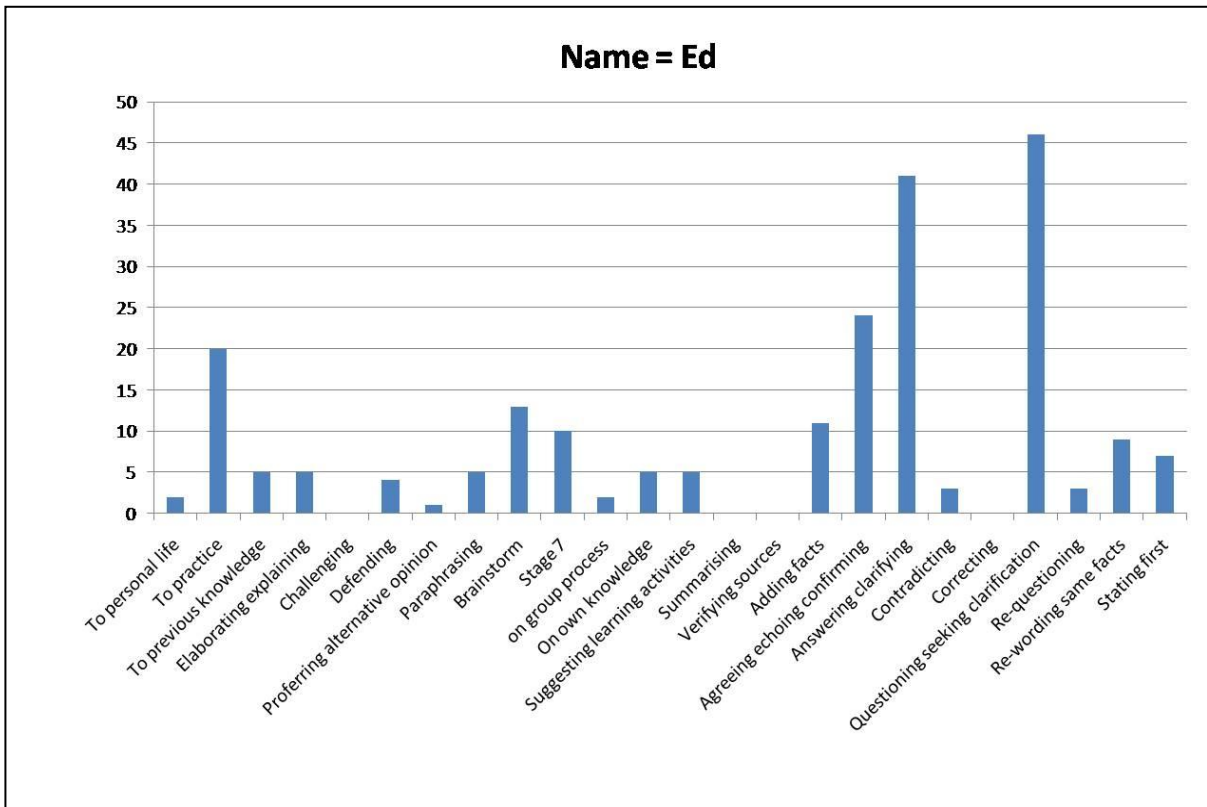
Figure 27: Den's participation weeks 2, 4, 5 & 9 combined

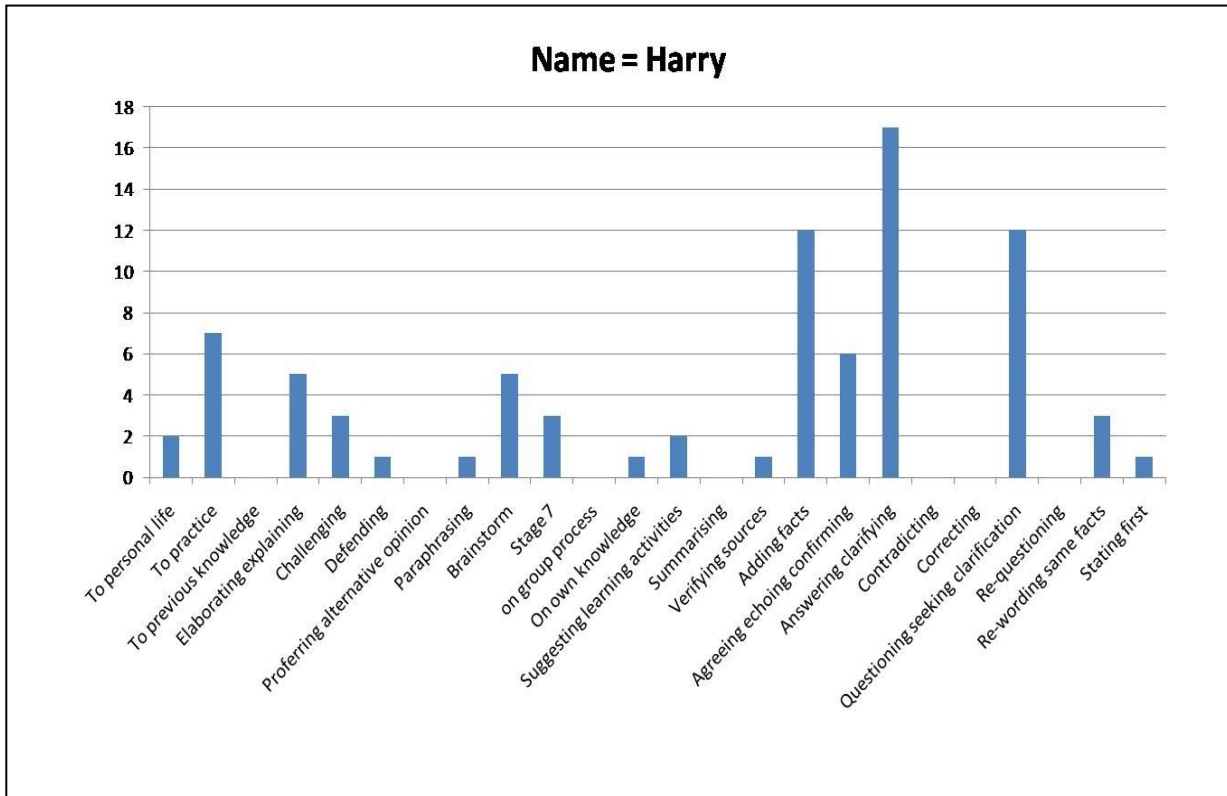Figure 28: Ed's participation weeks 2, 4, 5 & 9 combined

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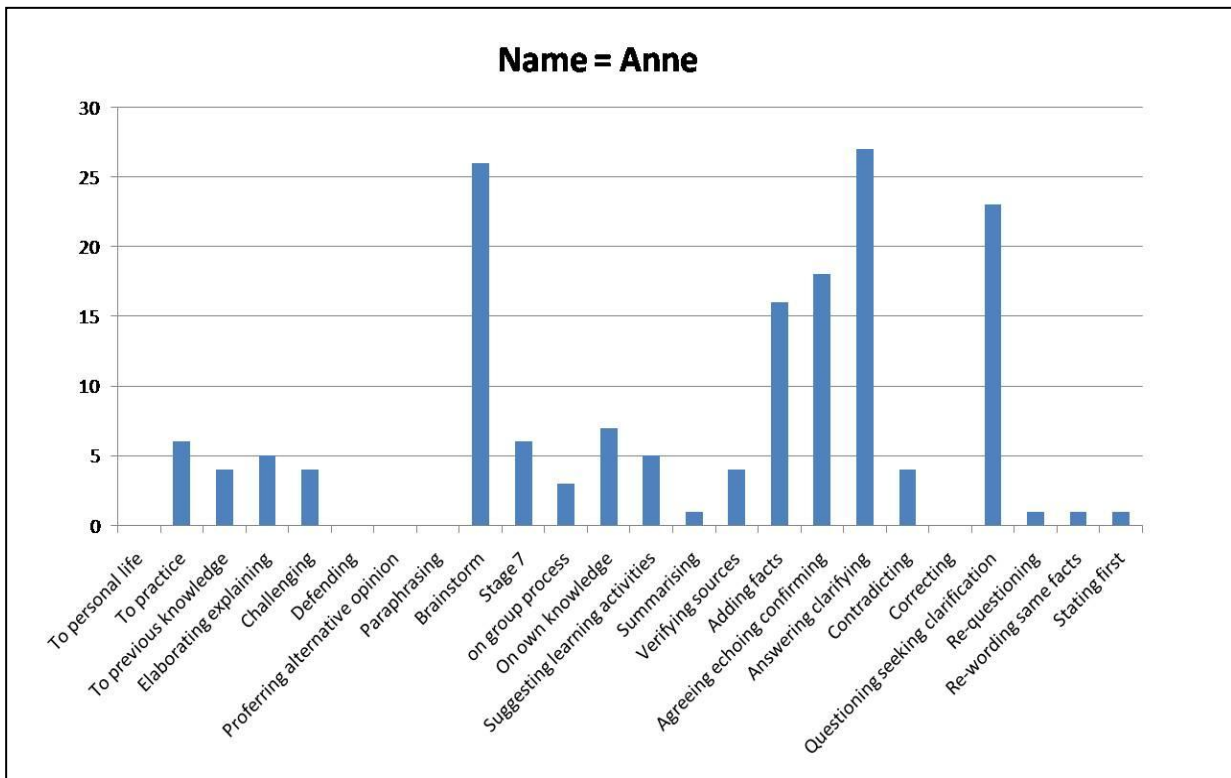**Figure 29: Harry's participation weeks 2, 4, 5 & 9 combined**

Figure 30: Anne's participation weeks 2, 4, 5 & 9 combined
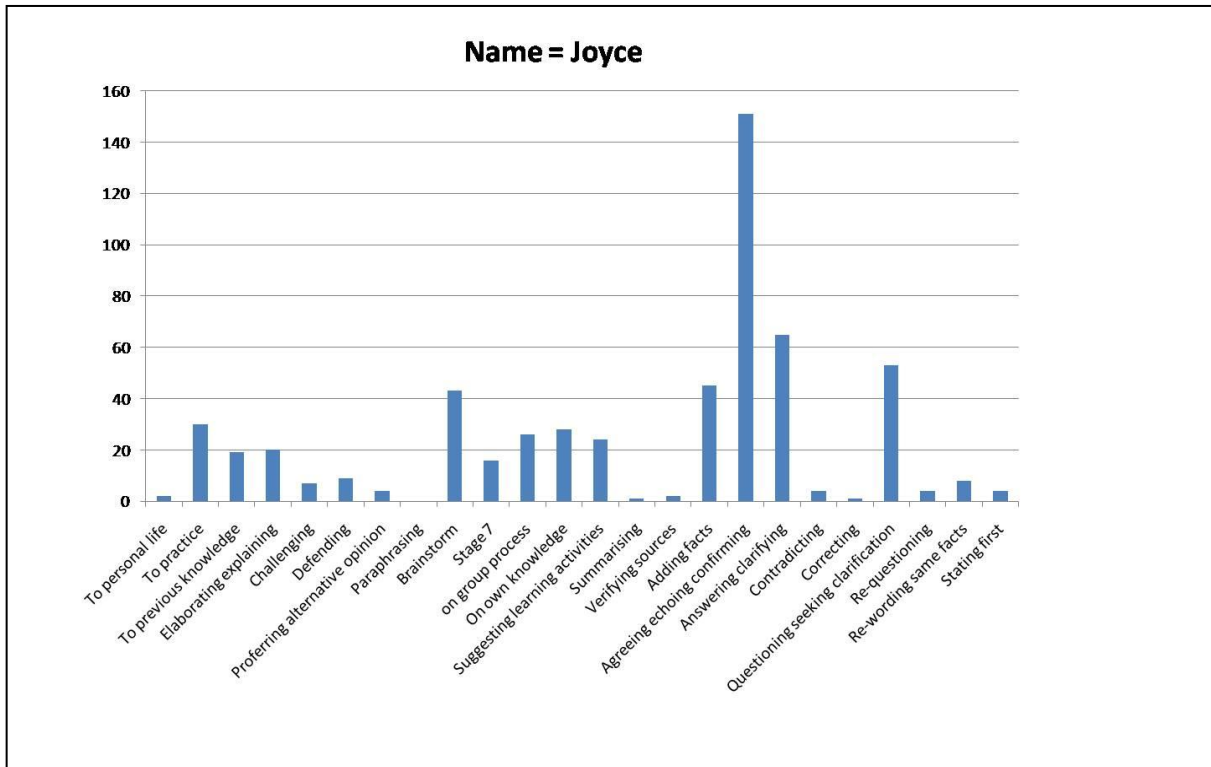
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Figure 31: Joyce's participation weeks 2, 4, 5 & 9 combined
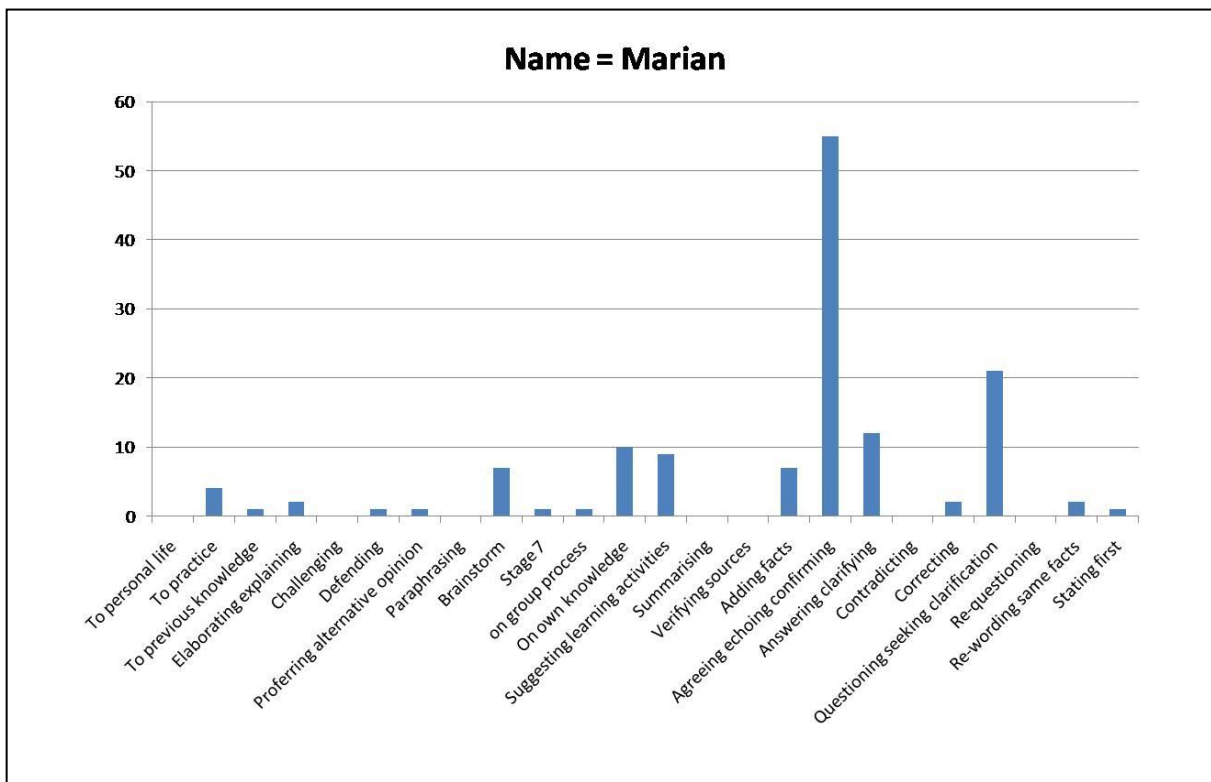

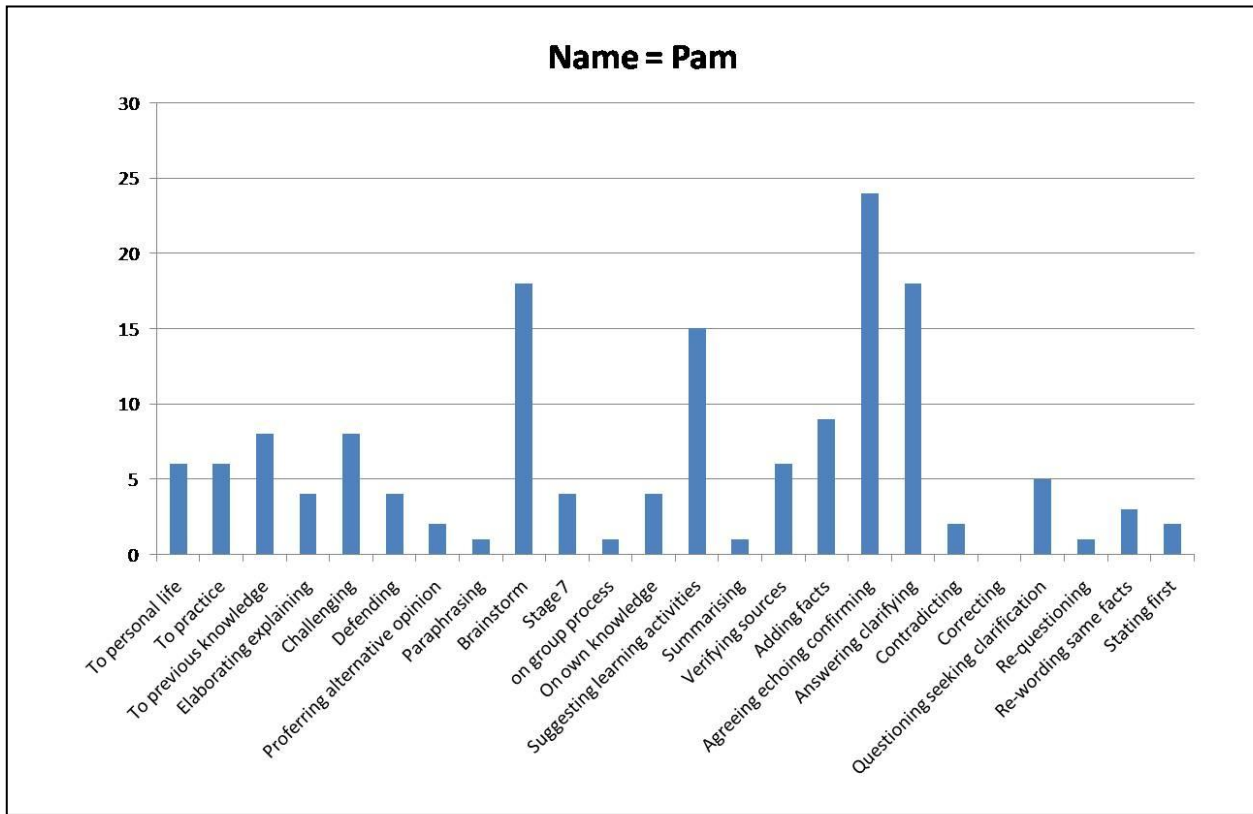
Figure 32: Marian's participation weeks 2, 4, 5 & 9 combined

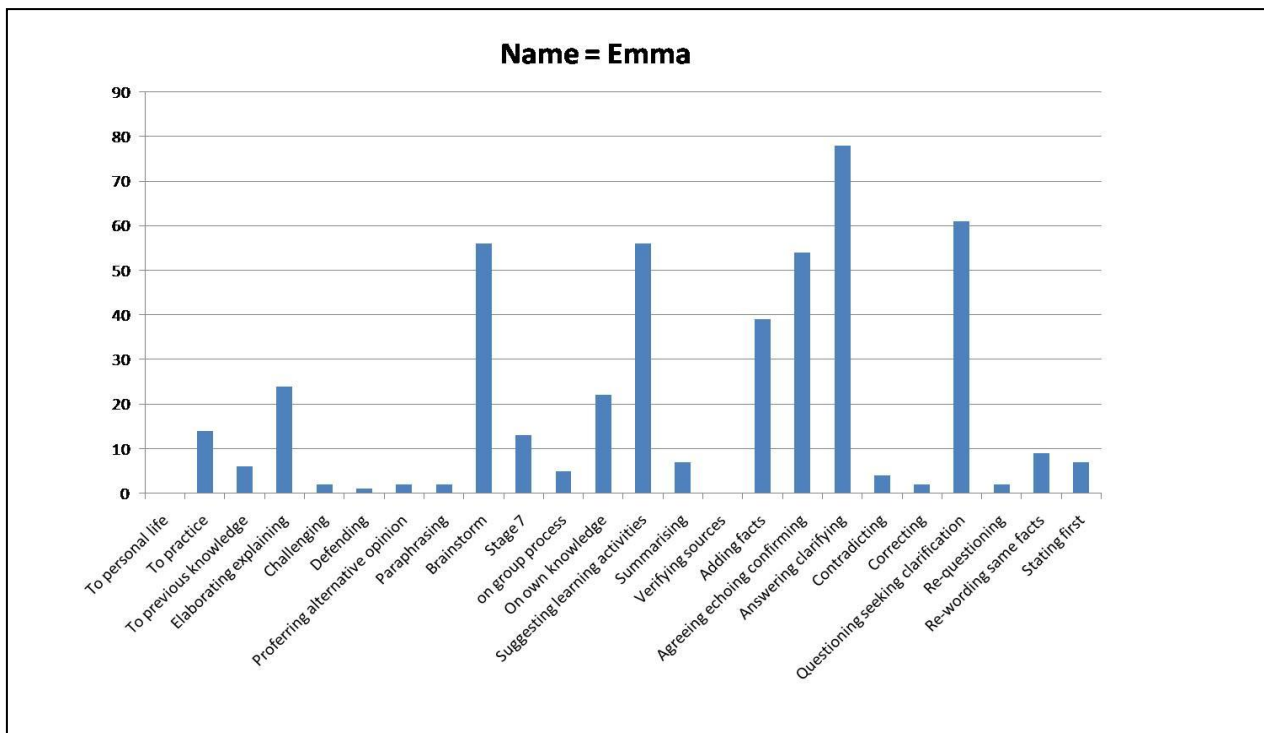Figure 33: Pam's participation weeks 2, 4, 5 & 9 combined

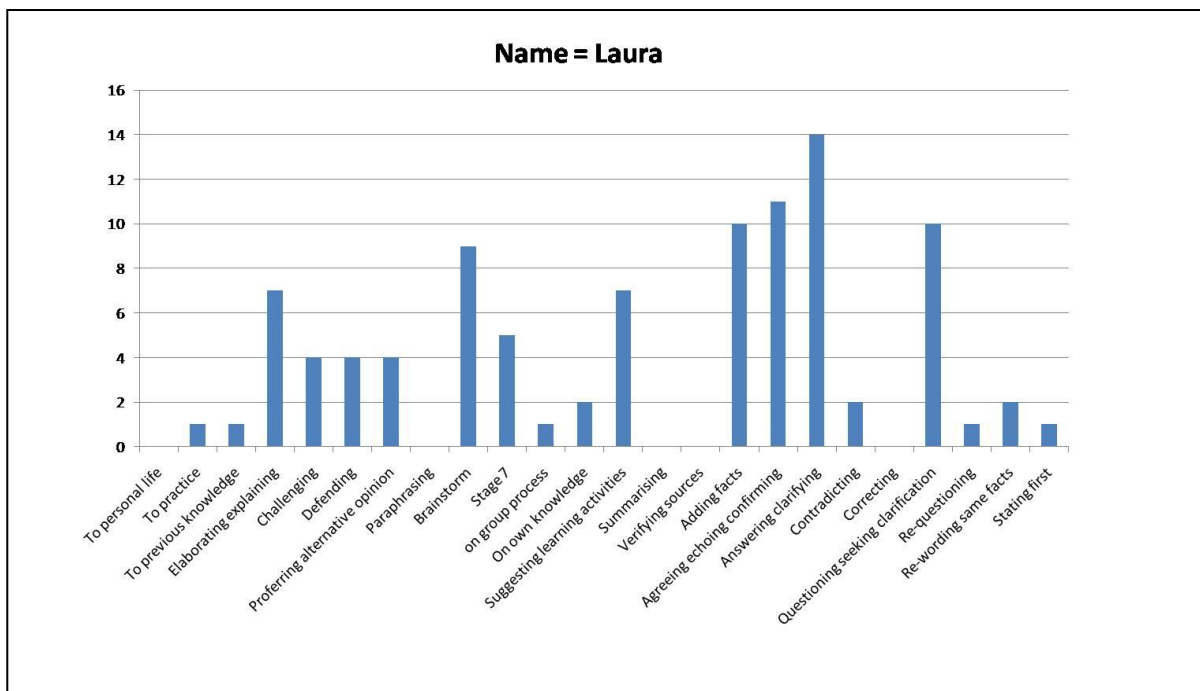Figure 34: Emma's participation weeks 2, 4, 5 & 9 combined

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Figure 35: Laura's participation weeks 2, 4, 5 & 9 combined

By observing the charts of individual student's interactions, a number of patterns emerge. There is a peak for agreeing/echoing/confirming noted in all students graphs, providing further evidence that this group favour a rapport-maintenance style since this interaction is not only void of FTA but also enhances and supports face. However, the younger students, Emma, Laura and Pam appear to have flatter charts. Their engagement in higher cognitive, high face threat interactions is less differentiated from their engagement in the lower face threat. This is not because they engage in higher cognitive level interactions more than mature students but that the older students appear to have relatively more low face threat interactions. This suggests younger students may be less concerned about maintaining group harmony than the older students. The exception to this is Anne who has some peaks in the higher cognitive interactions, in particular brainstorming although, overall Anne's level of participation is one of the lowest in the group. This supports the notion that participation rate on its own is not a good indicator of quality of input or a predictor of success, since Anne went on to graduate at first attempt with a good quality degree.

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Although there are some common features across all students, there appears to be some differentiation in pattern between younger and older students. There were no patterns on the grounds of ethnicity, since Den, Harry, Jay and Ed all had differing distributions of interaction.

To summarise, observing patterns of participation enables interesting comparisons across students. There are some common issues which define the emerging group ethos but there are also clearly individual traits and preferences. There are no other groups to which these observations might be compared, therefore no assumptions or generalisations can be made. Nevertheless, the descriptive statistics provide support for the interpretations made of the qualitative data, namely that: i) students tend to prefer lower face threat interactions, ii) PBL procedural guidelines force higher order cognitive interactions, and iii) mature and younger students appear to participate in different ways.

Chapter 5: Discussion

What this study has shown is that the learning interactions which students have to engage in when performing PBL are not only cognitively challenging, but socially difficult too. This study is unique because, unlike other studies of what students do in PBL, it has used the notion of face to illustrate how interactions can be described by the discomfort, or face threat, they engender and, consequently, how choices made in managing this discomfort impacts on the subsequent learning. I have focussed specifically on the learning interactions identified by students as potential instances of 'face threat', as these are the critical interactions, or FTAs, and represent the moment at which learning would potentially take place. The strategy taken by each student to handle this critical learning interaction is the RM strategy. Thus the study explores how the social and cognitive elements of learning are closely interlinked.

The following discussion will address each of the specific research questions using the concept of PBL's FTAs and RM.

Research Question 1: What learning interactions do students encounter in Problem Based Learning?

Students were asked to describe, from their experiences, what they did in PBL. Interactional functions were identified with the roles of chair, scribe and team-member. The way the students constructed these roles, from their lived experiences, was as an interactionally difficult set of roles and obligations and this led the discourse analysis to focus in on FTAs. Although others have provided lists of responsibilities for PBL roles (Wood, 2003) these have tended to relate to procedural functions rather than specifying *how* a student carrying out the role has to interact with others for the process to be followed successfully. So for instance, according to Woods (2003), the role of the chair includes "encouraging members to participate". However, from the perspective of those carrying out the role, my students reported this as "singling people out" and expressed discomfort with the communicative demands of such a responsibility. The role of chair, therefore involves more than mastering the procedural requirements; it also makes social demands on the student to manage the threat to face. This helps to explain why

others have also found that students have reported experiences of anxiety when undertaking PBL (Treloar, McCall et al., 2000; Chung and Chow, 2004; Lloyd-Jones and Hak, 2004; Chauvet and Hofmeyer, 2007).

FTAs are complex interconnections between what threatens own and what threatens other's face. For instance, putting someone else on the spot causes them face threat, but also shows the instigator in a bad light as they have disrupted the interpersonal rapport. Brown and Levinson called this the "mutual vulnerability of face" (Brown and Levinson, 1987 p61) and Ting-Toomey and Cocroft (1994 in Spencer-Oatey 2008 p32) suggest that generally people prefer communicative strategies which maintain rapport. The obligation to carry out a role according to the group rules adds a further layer of complexity. If someone does not carry out their role, then, because they are observed by others including their tutor, in their omission they threaten their own face. However, carrying out that role may cause face threat to another. For instance, when a chair asks a quiet student to contribute, they are fulfilling their role as a chair but they are putting that person on the spot. Yet, failing to encourage that person to participate would make them a poor chair in the eyes of the other students and the tutor, thus they flout their societal role and in so doing threaten their own face and the RM of the group. Nevertheless, in this group students expressed most discomfort as threatening others' face, so quality learning interactions were ultimately sacrificed.

Certain PBL interactions described as desirable for critical analysis in constructivist learning, such as disagreeing and managing conflict (Resnick, Salmon et al., 1993; Andriessen, 2006; Nussbaum, 2008; von Aufschnaiter, Erduran et al., 2008), were not identified as a feature of PBL by the group and were rarely observed. Instead of identifying this as a negative feature, students reported satisfaction at being in a group which was supportive and non-threatening a consequence of the fact that FTA avoidance was tolerated. Looked at another way, there was no expectation from the students that PBL should include disagreement or that to be intellectually challenged was a necessary aspect of PBL or of studying for a degree. This supports the findings of others that the majority of interactions in PBL are associated with superficial engagement with the topic

(Visschers-Pleijers, Dolmans et al., 2006), described by Mercer(1996)as cumulative reasoning as opposed to the deeper exploratory questioning.

This suggests that what other researchers have proposed as causes of superficiality only reflect the reluctance of students to engage in the FTA because of emotional and social discomfort rather than intellectual or procedural ineptitude. For example, previous explanations for superficial student engagement in PBL discussion have focused on intrinsic features of individual students such as poor motivation (Dolmans and Schmidt, 2006), lack of previous exposure to critical learning methods (McLean, 2004), poor levels of communication related to over- and under-participation (Hendry, Ryan et al., 2003) and failure to follow process (Moust, van Berkel et al., 2005). However, all these characteristics, which indeed result in superficiality, can be explained by understanding them as responses to managing FTAs.

The majority of interactions encountered by, and expected of, students in my study were found to be face-threatening, even cognitively simple interactions such as speaking out, especially being the first to initiate a discussion or to air an idea. Speaking out is perhaps more problematic in PBL than other forms of small group work as, by definition, students often have little prior knowledge of the subject because in PBL the trigger is presented before the learning. However, even in the feedback sessions (i.e. after the period of self-study), students felt similarly exposed because their intervening week of independent learning had been self-directed and they had yet to receive confirmation of the veracity of their understanding. Expectations of whether a student should 'know the answer' or not have been shown by others to impact on face, and consequently on communicative strategies (Rees-Miller, 2000), and is related to the fear of 'getting it wrong' associated with more traditional educational experiences where students put up their hand if they have the right answer. This may be felt even more acutely by those such as mature students and those from eastern cultures, who have experienced traditional tutor-centred education and where the concept of the role of tutor is therefore different to students who have experienced more student-centred learning, as highlighted by several authors, including, Spencer-Oatey (1993) Nakane (2006) and Jackson (Jackson, 2002).

These studies report that homogeneous groups of Chinese students are reluctant to speak up in class. Jackson's (2002) participants for instance, reported that although this was due to a number of complex inter-related issues such as use of English (the students' second language) as the instructional language, previous educational experience of tutor-led learning and the need to 'get it right'. They also reported a cultural reticence to disagree or speak unless invited to do so. Indeed, all of these issues might cause the student to feel uncomfortable in speaking out because they impact on their sense of self-esteem or face. Thus face is again the issue to tackle in attempting to improve student participation. Therefore, face and its impact on behaviour is a concept relevant to all contexts in which the fear of being judged negatively by others is the risk, even though the factors contributing to what is construed as face-threatening and what magnifies the potential for face loss may be different. In an institution such as Higher Education where there are various stages of knowing and coming to know, the opportunities for being judged negatively or incorrectly are plentiful. This is enhanced further still in PBL, where an individual's ignorance is made public as part of the process.

Implications for assessing student performance in constructivist learning

As shown in this study, nearly all interactions, no matter how cognitively challenging they may appear to be, have the potential to cause face threat for students carrying out those interactions. Nevertheless, in constructivist pedagogies, such as PBL, they can not be avoided without negatively influencing learning; student-to-student interactions are essential to enable learning to take place. This is because learning is initiated verbally at the individual level, i.e. an utterance from an individual, but is then elaborated by others at which point the learning behaviour becomes overt, i.e. using Vygotskian terminology, learning moves from the individual psychological level to the social interactional level (Liu and Matthews, 2005). Engaging in constructivist learning, therefore, requires not only intellectual ability in the individual but, where the next stage involves face threat, also requires appropriate communication skills. Thus, some cognitive processes are not just dependent on intellectual level but also on social competence and, in this regard, conventional taxonomies, which only consider cognitive level, are not comprehensive

enough for categorising the quality or level of collaborative learning. For example, using taxonomies of cognition, learning interactions such as stating and paraphrasing are evidence of the students' "knowledge of the underlying concepts and principles" (QAA, 2008), "knowing a lot" (SÄLJÖ, 1979) and "knowledge" (Atherton, 2010). For all these taxonomies, knowledge acquisition, as expressed in a PBL utterance, is recognised as the lowest level of cognition. However, as argued above, verbally expressing this knowledge in the presence of others, especially when there is doubt about the validity of the knowledge and how it will be interpreted by the rest of the group, can constitute an FTA. Conversely, interactions which would conventionally be deemed high order in terms of cognitive level, such as making reference to literature sources used to provide feedback information, and reflecting on own performance, were not perceived by the students to be FTAs because they do not put 'self' up for judgement by 'others'. Rather, they are judgements of 'own' performance by 'self'. Although such interactions were infrequently observed in this study, I propose this is because they are cognitively rather than socially challenging.

I therefore suggest that conventional classifications for learning interactions can be further sub-divided according to their impact on face, and subsequently on rapport. The four categories might be structured in a three-level taxonomy as follows:

1: Lowest level of participation

These would be easiest for students to achieve and would therefore attract least credit in evaluation or assessment of interaction

Low cognitive and low rapport threat

Interactions which students should find easiest in that they do not threaten face or rapport and are also cognitively undemanding. From this study they include: re-wording same facts, adding facts, application to personal life (anecdote), questioning (seeking clarification), answering/clarifying, agreeing/echoing/confirming, application to practice (anecdote)

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2. Second level of participation

These would be harder for students to achieve cognitively or socially than 1) and would therefore attract more credit in evaluation or assessment of interaction

High cognitive and low rapport threat

Interactions which are favoured in that they do not threaten face or rapport but for which students need some cognitive development. Require tutor support to develop cognitive level. From this study they include: reflecting on own knowledge at end of session, verifying sources

Low cognitive and high rapport threat

Interactions that are difficult as they are rapport- threatening although students should have the cognitive ability to engage in these. Require tutor support to develop opportunities to reduce factors impacting on face, such as power and/or distance. From this study, they include: stating first , correcting (an incorrectly stated fact), re-questioning, contradicting, paraphrasing, summarising

3. Highest level of participation

These would be hardest for students to achieve and would therefore attract most credit in evaluation or assessment of interaction

High cognitive and high rapport threat

Interactions that are difficult as they are rapport-threatening but students may also not know how to undertake these or even know that they should be undertaken. Requires tutor support to develop cognitive level and opportunities to reduce factors impacting on face, such as power and/or distance. From this stud,y they include: reflecting on group process, postulating solutions (during brainstorming), elaborating/explaining, application to/of previous

knowledge, defending, challenging, suggesting learning activities, postulating

solutions at stage 7 (feedback), proffering an alternative opinion

In this context, because the study concerned Year One students, low and high cognitive levels are related to level 4 (HE levels for England, Wales and Northern Ireland) and further work would need to be done to determine appropriate learning descriptors within a taxonomy for levels 5 and 6.

To summarise, in answering this research question I have reconstructed the roles students encounter in PBL with reference to the social demands made, according to the lived experience of the participants themselves. The unit of analysis has been the communicative act, or learning interaction, associated with the various PBL roles, rather than the individual students or group, and I have shown these communicative acts to be face-threatening. Therefore the findings reported in this section are applicable to all PBL contexts not just those in which there is diversity. This makes the findings relevant to all practitioners of PBL, presenting them with a new frame through which to consider preparation, support and assessment of students who are participating in PBL. However, because i) what constitutes face threat, ii) the degree of face threat encountered, and iii) the RM strategies employed have been shown to be influenced by social and cultural differences between interlocutors (Spencer-Oatey, 1993; Spencer-Oatey, 2008), the RM framework is ideal for analysing what happens between diverse students within this socially complex context of PBL. The next research question, therefore, focuses in on interlocutor diversity as causal factor for communicative problems in PBL. Thus the group becomes the unit of analysis.

Research Question 2: How does a culturally diverse group of students manage these learning interactions?

The next section will consider how the students managed the learning interactions which they had identified as face-threatening. I will start with a consideration of FTA avoidance, as this is the point at which learning is sacrificed in order to save face and manage rapport. I will suggest possible reasons for such a strategy related to the context of cultural diversity. I will then go on to look at the group's Sociopragmatic Interactional Principles (SIPs) and how these are formed by, and forming of, FTA-avoidance as an interactional outcome.

Avoiding FTAs

There were many instances of FTA avoidance observed in the current study. For instance, refusal to single people out for contribution (by most of the students in the role of chair) and failure to correct or disagree. Silence was also employed by speakers to protect own face, not just that of others and this was evident in the many silences following a general request for contributions.

 Throughout my study, I have observed silence to be a conscious communicative strategy, i.e. a deliberate choice made by students to avoid a perceived FTA. This has enabled me to make assumptions about which interactions were felt to be face threatening to the students. However, I acknowledge that categorising silence merely as a choice to avoid an FTA oversimplifies the complex nature and role of silence in communication (Sifianou, 1997; Ollin, 2006). Ollin (2006) points out that there has to be an expectation that talk should exist for silence to be construed in a negative manner. Indeed she points out that silence in the classroom environment can be a useful tool employed by tutors to provide students with a space to reflect and think. In my study context, however, verbal interaction for learning was the purpose for which the group was created. In other words, speaking out was essential to achieve the learning goal. The participants themselves were in no doubt as to this requirement, as evidenced in PBL session 1 when

students discussed the role of the group members. One comment to which they all agreed was,

"erm I've got listening, respect each other's opinions, co-operating, communication"

Ian PBL session 1

and, furthermore, students expressed discomfort at silences,

"I just find it quite stressful the actual, you know waiting for somebody to talk".

Joyce Interview 1

One of the ways Ollin's (2006) participants construed silence was as an "absence of demand on the individual from other people" (p443). Silence may be thus constructed as facilitative of face-saving because, according to Ollin's participants, the face being saved is the (potential) hearer's resulting from a lack of imposition by the (potential) speaker. Hearers might, therefore, welcome the safety which such silence may confer. From this, it is logical to assume that a (potential) speaker might also employ silence in a conscious and deliberate strategy, i.e. avoid a face threat to another, in order to maintain that safety or rapport.

In both these strategies (silence to protect own face and silence to protect other face) the students are using silence deliberately, and in this regard the silence is a positive option, not thrust on one another in a deliberate way to be impolite or rude. However, from the perspective of the interactional goal, the silence is dispreferred as it prevents learning from taking place. Furthermore, silence itself is a cause of discomfort to the students as it flouts the participative obligation of group member. I therefore feel justified in claiming that for the most part, in this group, although silence was employed as a face-saving strategy, silence was actually dispreferred by the students. The students appeared trapped in a no-win situation with discomfort at speaking out and discomfort at remaining silent. Perhaps, by avoiding the FTA altogether, the path of least resistance was taken.

Use of silence for analysing group over time and context

Having shown that, although complex in nature, silences can be construed in the study context to constitute a face-saving strategy, albeit one which is dispreferred, an analysis of the use of silence over time is useful. This is because it can throw light on whether the FTAs became easier to achieve which, according to facework theory, should be the case when there is reducing social distance (Brown and Levinson, 1987). In my study, I refer to a reducing social distance as an increasing familiarity with the other students' communication strategies and belief systems. The argument follows that as the students in the group get to know each other, their number of silences should diminish (Brown and Levinson, 1987; Spencer-Oatey, 1996). This is because interactants can i) begin to predict how their utterances will be received, and ii) use the most appropriate linguistic markers to mitigate FTAs based on their developing knowledge of what appears to be acceptable to the hearer and the context. One student alludes to this when she discusses her expectations of PBL earlier on in the study

> *"I think like as well as we get to know each other everyone's confidence will increase over time (yeah, hm hm from group) so you know you'll get the erm people will agree with you and stuff so you'll build your confidence over time being able to speak like you can say anything what you want"*
>
> *Laura PBL session 1*

This argument suggests, therefore, that there would be fewer silences over time, these being replaced with attempts at the FTA which may or may not be mitigated with politeness markers. However, as the results show, this was not the case and there were more silences in PBL session 9 than PBL session 1.

I propose that a number of inter-related causes related to student diversity probably account for this finding: i) cultural differences have made social integration, and therefore a reduction in social distance, less likely so that the students are unable to become familiar with one another's communication strategies; ii) over time, other factors come into play such as the establishment of power differentials which impact on the weight of the face threat for some students; iii) the period of time over which the study was conducted was too short to identify a reduction in social distance sufficient to impact on the weight of the FTA. I will now explore the impact and inter-relationship of

these variables i.e. social distance, cultural diversity, and power over the time of the study.

Cultural Diversity

Relationship between social and cultural diversity

When the students meet for the first time in a diverse group, they are not only social strangers but cultural strangers too. This is because cultural diversity presents the students with the possibility of unknown communicative strategies which may be different to their own in both linguistic and socio-pragmatic approaches, predicated on cultural and historical practices (Zegarak, 2008). As students get to know each other and become less socially strange, these different strategies move from unknown to known, and may even result in accommodation or divergence towards one another's styles as they come to develop theor own group culture (Gallois, Ogay et al., 2005). It is clear, though, that students have to engage in social conversation with one another to enable this to happen. I propose that, for reasons explicated in Byrne's Similarity-Attraction theory (McPherson, Smith-Lovin et al., 2001)-explained below- for this group, cultural diversity has been a barrier to social integration which, in turn, has resulted in retention of the social distance between students. The outcome is that this diverse PBL group prefers avoidance strategies when faced with FTAs associated with their learning interactions, and that this does not change over time.

There have not been many other studies exploring the impact of student diversity on learning interactions per se, in PBL. Rather, most have focussed on outcomes in terms of participation and experiences between students of different genders (Mpofu, Das et al., 1998; Duek, 2000), and ethnicities (Duek, 2000; Treloar, McCall et al., 2000; Woodward-Kronn and Remedios, 2007; Gwee, 2008) working in mixed groups but these have not explored the impact of diversity itself on the development of the group and student learning interactions. However, McLean, Van Wyk et al (2006) and Singaram, Dolmans et al(2008) did attempt to determine whether PBL would work in ethnically mixed groups and whether the group work enabled through the PBL process would foster socialisation.

Both these studies argued that students perceived diversity in PBL groups as something positive which contributed towards their learning. McLean, Van Wyk et al's study (2006), which used questionnaires to identify each student's experiences of small group work, showed that students commented positively on working with those from other backgrounds in terms of the diverse nature of perspectives that were brought to the discussion. However, McLean, Van Wyk et al's claims that the small groups encouraged socialisation amongst students from different backgrounds were less well supported, as students' reports of making friends did not make clear whether these were with students from other backgrounds, only that being in a PBL group enabled them to make friends. The students in my study also claimed to be a friendly and supportive group with many commonalities related to behavioural and communicative styles (shared sense of humour, quiet, shy) and common goals in their shared identities as radiography students. However, when pressed further about their socialisation outside the group it was clear that this did not happen. The group did not meet up when there was opportunity to do so, such as in formal lectures or for lunch, and although they arranged one group social event at the end of the year, Jay's statement summarises the situation well,

"some of them for whatever reasons don't particularly want to engage on a personal level, it's strictly professional and that's fine there's not a problem with that"

Jay interview 1

Small sub-groups of students from the study PBL group did tend to integrate and these were segregated by common identities particularly related to age and age-related roles such as being parents. Such identity grouping is explained through Byrne's similarity-attraction theory or homophily, which outlines the preference of individuals to seek associations with similar others. Preferences for social networks have been categorised variously as: 'status homophily', based on major socio-demographics that segregate society such as race, ethnicity sex or age; and 'value homophily', related to acquired values and beliefs such as religion and education (McPherson, Smith-Lovin et al., 2001). This body of research, reviewed by McPherson, Smith-Lovin et al (2001), provides strong evidence that groups will segregate when it comes to social networking, in particular on the grounds of race and ethnicity, and age. It is hardly surprising, then, that students in diverse PBL groups do not report socialisation beyond the PBL activity itself. Singaram et

al's later (2010) study reported this effect too. Despite students identifying the potential for the varied perspective of diverse others to enrich learning interactions, this did not happen and African students reported that their opinion was not aired in PBL session. Furthermore, socialisation beyond PBL was not realised either. This better reflects my findings and I contend that the two concepts of social and cultural distance are inter-related. Large cultural differences between students can prohibit socialisation and, in such a situation, what is experienced as face-threatening does not diminish over time.

Power as a contributory factor

Along with social distance, power has been described as another variable which impacts on intercultural communication (Brown and Levinson, 1987), so is an important concept to consider in an analysis of diverse PBL groups. For power, I refer to the notion of a differential "vertical relationship" between speaker and hearer, or other group members (Spencer-Oatey, 1996). Such differentials may be based on perceptions of symbolic, authoritative and/or status differences between interlocutors.

Post-modern constructs of power (Harris, 2002; Watts, 2003; Locher, 2004) criticise notions of power as a fixed and predictable variable, arguing instead for it to be viewed as a dynamic characteristic which is formed by, and forming of, relationships, and I believe this is borne out in the current study. These notions have also been theorised at length by sociologists such as Bourdieu. A full critique of Bourdieu's work is outside the scope of this thesis. However, he suggested that the position people occupy in society with respect to power is dependent on the volume of their 'capital' with reference to financial, cultural and social commodities and that as the acquisition of these change so can the individual's position in society (Wacquant, 2006). Seen in this way, power as a concept can be used to explain the developing dynamics of a diverse PBL group. In such a group, individuals will initially present with a range of physical and metaphysical commodities, some of which are overt (such as physical differences related to age, gender and ethnic background) and others which are as yet unknown (such as previous knowledge and skills), and some of which will change over time (such as developing knowledge and skills). At a sociological level, physical attributes may engender

stereotypical culturally-based power differentials which replicate attitudes and behaviours from the wider society, for example, perceptions of power related to age, gender and race, and these may be perceived differently for each student depending on their own cultural frame of reference which determines what is held in high regard and, therefore, worthy of reifying.

Bourdieu proposes the notion of the doxa (Wacquant, 2006) which is the natural taken-for-granted attitude of everyday life. A doxa is not something that exists objectively but is a result of shared meaning between people influenced by the same cultural and historical background. In a diverse group of individuals it may be fair to assume that there may be a clash in the primacy of one doxa over another. This was not observed in my group. This may be indicative of the fact the students, while culturally different on a micro level (age, ethnic background, educational experience and qualification), reside within the same British society in 2007 and what is valued by this society as a whole has a greater influence over establishing what counts as powerful in microethnographic contexts.

This may also explain why, in my group, one of the most discriminating variables in terms of power was age because, in the current British culture (and most others), age is a legitimate position from which to claim power (McCann, Dailey et al., 2005). Age as power in this PBL group might therefore be classified as what Bourdieu refers to as symbolic capital, only legitimate because it conceals the artificial power relations which are the basis of its force, what Watts refers to as "the silent orthodoxy of the doxa" (Watts, 2003 p151).

Unlike any other demographic variable, all students mentioned age when asked how they differed from the others. Although all students also referred to this in a positive way, some of the older students admitted it was harder to work with students of a different age and this perception has been replicated in studies reported in literature from the Human Resources (HR) discipline (Zemke, Raines et al., 2000; Avery, McKay et al., 2007).

According to Vauclair, Abrams et al (2010) Robert Butler first coined the term ageism in the 1960's in his criticism of how older people were treated and how their identities were

constructed by practitioners in health care. The concept of ageism is now applied more widely to other aspects of society and can be considered in three broad terms i) prejudicial attitudes, related to age in general (i.e. applicable to youth as an age group too), aging and the elderly, ii) negative discriminatory practices where older or younger people are treated differently on the grounds of their age, for instance in terms of employment, iii) inadvertent discrimination resulting from institutional practices and policies which patronise and remove dignity and autonomy from, for example, the elderly, constructing old age as a negative concept through the discourses employed . Similar stereotypical constructs for youth are also prevalent.

Implicit in this broader application is the notion that ageism is much more pervasive than originally described. It is evident in people's reactions to physical appearance, their use of language, and imagery in the media, as well as employment and healthcare (Wilkinson and Ferraro, 2002). Abrams, Eilola et al (2006), suggest that more than 25% of people in Britain have experienced ageism at some stage and that this is higher than any other form of prejudice. Furthermore, Nelson (2002) suggests, unlike other forms of prejudice, people generally appear more ready to express age prejudice explicitly, and this was certainly a feature of my study, with all students talking freely, and without prompting, about age as a difference. Ageism is also unique as form of prejudice because, as Levy and Banaji (2002) showed, people often apply these stereotypes to themselves resulting in limited self-aspirations based on assumptions of what they can or can not (should / should not) do as a person of their age. This has implications for mature students. Self-doubt may lead to the creation of a self-identity associated with incompetence. This will be more acute when others in the group are younger school leavers, and this was evident in the comment made by one of the mature students,

> *"having just done A levels or whatever it is they've done, gone through college, I suppose their knowledge is much fresher on a lot of the background stuff is sort of straight from school learning rather than background knowledge from life and you do notice the difference when they talk about chemistry and things like that, they know, they've remembered"*
>
> *Ann Interview 2*

However it is misleading to consider age only in terms of two groups: 'young' and 'old'. Garstka, Schmitt, et al, (2004) showed that when considering a third group – the middle-

aged or people in their 40s– this group are perceived to have the highest social status among the three groups, followed by young, and then old age groups. This better reflects the findings in my study since the mature students, in their interactions, were seen to dominate and were deferred to by the younger students when there was difference of opinion. Observing students, therefore, brought the tensions associated with age diversity into sharp relief. Younger students were less frequently held in esteem by the older students and, when there was contradiction in learning or understanding, it was generally the older students' input which was settled on as being correct without validation from supporting evidence. Quite frequently, learning constructed this way was factually incorrect; the younger student had arrived at the correct learning outcome but this was dismissed as incorrect by the others in instances of disagreement. Younger students avoided the FTA of argument to support their position.

Over the course of the first year, two of the younger students interrupted their study on the grounds of ill health. The remaining younger student went on to graduate with first class honours and achieved higher marks than anyone else in the PBL group. At the end of the first year the perceptions of the mature students about this young woman had changed. Jay said in his final interview that he was surprised at how well she had done and admitted to undervaluing her input. His comments suggested that she was unique as a young person rather than that his perceptions of young people had changed however; evidence of persistence of the doxa. Baron and Kerr refer to this as 'exceptional case bias' where stereotypical views are clung to even in the face of disconfirming evidence, because re-thinking attitudes and stereotypes is an uncomfortable, personal challenge (Baron and Kerr, 2003).

The concept of age differences in learning groups is not well explored in the literature. However, I have shown it has the potential to impact on social and power relationships, affecting group dynamics and socialisation and presenting issues of inequality of voice. This is supported in the little literature that does exist in this area in, for instance, Howard and Henney's work, which showed younger students are less likely to participate in classroom discussion than mature students (Howard and Henney, 1998). This is an area

which needs to be explored further, especially in light of the increasing numbers of mature students accessing higher education on the back of the lifelong learning agenda. Whilst UK government spending on HE in 2012 will be cut (Cable and Willetts, 2011), the notion of lifelong learning and education is not new (Field, 2006), and the need to develop a workforce which is flexible and adaptable to the demands of the global economy perpetuates through the skills agenda (Cable and Hayes, 2010). Work-based, community and on-line learning spaces may replace some of the more traditional classroom-based learning activities for mature students in the short term, but these will present their own complexities for mixed-age learners, where the doxa of ageism still exits.

Similar issues may exist for students of non-English ethnicity. This was reported by Duek (2000) yet was not a key finding in my own study. Observing the students, there was no evidence that those from ethnic minority groups were undermined in interactions. Quantitatively, there was some evidence to show that the ethnic minority students, taken together, participated less frequently than the white British students. If fewer FTAs were attempted, and observed, it would have been less easy to detect power differentials. Although not statistically significant in my study, differential participation rates, with regard to ethnicity, have been reported in other studies(Nakane, 2006). However, whether this is a result of being in a less powerful position as a result of minority, or if this reflects a cultural preference for less vocal behaviour (Gwee, 2008), or as a result of educational tradition (Kember and Gow, 1991; Wun, Tse et al., 2007)is not clear. Individually, students did not talk about ethnicity as difference and less vocal students, several of whom were also white British, put their reticence down to their preference to observe. However, the failure of students to discuss issues of ethnicity in itself may reflect a wider societal fear to do so which is recognised in other studies (Bhopal, 2001; Roberts, Sanders et al., 2008).   This, again, is a possible avenue for further study although, as detailed in the literature review, unlike age diversity, ethnic diversity in PBL is currently being explored (Duek, 2000; McLean, Van Wyk et al., 2006; Singaram, van der Vleuten et al., 2010). Sociopragmatic failure and differences in communication

strategy as a result of different ethnically-oriented communication strategies may have given rise to some perceptions of power inequity and this is discussed later.

Gender as a variable has not been analysed in detail here. Again, this was because there was no evidence, either through observation or in student interviews, that it had impacted on learning interactions. Like ethnicity, however, it may also be subject to being 'the elephant in the room' and to dismiss this out of hand would be naïve in the light of the vast body of feminist literature. In the context of radiography education, the male student is in the minority (approximately 40% males) however, and this may go some way to explaining why gender-related power struggles are not played out in the radiography classroom. Research related to differential interactional styles between males and females (in particular Mills, 2003) and research related to the differential approaches between males and females to PBL has been undertaken (Duek, Mpofu). The intersection of these two contexts would make interesting further study but, unlike age as a differential, was not thrown up as worthy of further analysis in this specific study.

Diversity of physical characteristics which trigger power responses based on shared doxa may govern initial relationships. However, as pointed out by Harris (Harris, 2002) power is dynamic rather than a static characteristic and as students in this group became more familiar with one another, the acquisition of other forms of capital was seen to shift the basis on which power was distributed across the group. Cultural capital in the form of knowledge and skills, and social capital in the form of an ability to manage rapport and conform to the communication ethos became more influential, thus privileging authoritative power (Spencer-Oatey, 1996)over symbolic power. Emma's input, whilst originally over-ridden on occasions by the older students, came to be highly respected by the group as a result of her knowledgeable inputs. Furthermore, her linguistic style became more direct over the period of the study. It is not clear whether her increasingly dominant and direct linguistic style was the cause of, or caused, her gaining esteem in the group.

Another important basis of power is legitimised or status power (Spencer-Oatey, 1996). In the context of PBL this is related to the role of chair which confers status power to the

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students, although only on a weekly basis. In addition, the underpinning PBL pedagogy gives students relative power over the tutor for directing their own learning. Exercising status power over others was a source of discomfort for those students who had had a more traditional educational background and were therefore used to a more subordinate role in the classroom. In diverse groups, some students may perceive their legitimised status power to present a huge vertical distance because of the importance they attribute to symbolic, or more tangible, cultural and social capital differentials, whilst in homogeneous groups there would be no vertical distance to traverse in exercising such power over peers. Diverse groups may therefore find power issues impacting on group development and learning interactions more acutely than homogeneous groups.

Sociopragmatic failure (Thomas, 1983; Zegarak, 2008) may also be responsible for setting up artificial vertical relationships. The influence of vertical inequality on communication and the way that FTAs are managed has been well described in the early politeness literature. Brown and Levinson (1987) showed that those in supra-ordinate position tend to use bald on-record language when making requests to those of a lower status, whereas subordinates mitigate their speech using negative politeness markers when making requests of superiors. However, the influence of power as a variable on communication has also been shown to differ between cultures as played out in linguistic preferences (Spencer-Oatey, 1993). Unfortunately, in a context of cultural diversity this means students who, by dint of their cultural background or because English is not their first language, use negative politeness and/or more hesitations ordinarily in conversations with equals, may inadvertently be positioning themselves as inferior to other group members for whom such displays of deference are equated to subordination (Blankenship and Holtgraves, 2005). Conversely, students who have a more direct approach in their normal speech may come across as abrupt and attempting to take a dominant stance. In my study there were certainly different styles evident between students.

Thus power, in all its forms, was constantly being established and re-established through group processes and the learning interactions. However, having the opportunity to yield

power over others is not necessarily a negative attribute. Power is not just concerned with repression but also empowerment, and discursive learning approaches, such as PBL, offer the previously repressed to become empowered, as reported by Wun, Tse et al (2007), and others have shown students who find it difficult to express themselves verbally to be incorrectly judged as incapable by tutors and peers (Blue, Stratton et al., 1998). As Foucault notes, "discourse is the power which is to be seized" (Foucault 1984 p110 cited in Cheek 2004). Furthermore, learning to use power effectively in the workplace is an aspect of leadership seen as desirable to NHS employers (Department of Health, 2010). Indeed, one of the aims of the current NHS White paper on NHS reforms is to:

> *"empower and liberate clinicians to innovate, with the freedom to focus on improving healthcare services"*

> *(Department of Health, 2010)*

Empowering students to assert themselves and lead others in an effective way is therefore as important a learning outcome as those related to more discipline-specific knowledge. However, this has to be done according to fairness and equity related to rules established by the group and not based on a symbolic notion of what is powerful as a given right. This confirms the importance of the ground rules set by the group at the beginning of the session, the effectiveness of which was evident in the students' tolerance of Harry's authoritative chairing style. Had the group not established rules that there would be a chair, elected weekly from the group, and who would be responsible for encouraging contributions from others, Harry's requests might have met with more resistance. Spencer-Oatey's RM model confirms the importance of agreed sociality rules and obligations for reducing the weightiness of face threat and thereby maintaining group rapport (Spencer-Oatey, 2008).

To summarise, unlike social distance, which sees interlocutors residing at two ends of a horizontal line that has the potential to diminish over time, power as a variable is not unidirectional, but is constantly in flux as it is negotiated by the students in interaction. Power can impact on social distance, though, as it sets up differentials between the students which may result in reluctance to socialise, thus retaining the weightiness of the

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FTA. PBL can provide opportunities for legitimised power which, when managed effectively with agreed rules, develops and liberates the students. However, it is important that students are provided with equal opportunities to exercise this power because, for some students, perception that their status is subordinated, be it as a result of physical or metaphysical factors, will make the FTA appear greater and they will become less likely to participate. Symbolic power, especially related to age, and socio-pragmatic failure appeared to be responsible for these effects in the study group.

Research Question 3: What is the impact of the group's communication strategies on group and individual student learning?

Discussion with regard to research questions 1 & 2 has shown that PBL is a learning approach which is high in potential FTAs and that a diverse group of students may be at risk of avoiding these FTAs as a result of cultural differences leading to social strangeness and differences in sociopragmatic and pragmalinguistic approaches. As has been shown, one outcome of this is that students may be marginalised and lose voice and position in the group. However, if FTAs are avoided, students may also lose out because important learning interactions do not happen. In a group which has been configured for the purposes of learning, this is important. The next section will discuss whether this was the case.

I will first discuss student outcomes in terms of rates of participation in the PBL process and then consider cognitive quality of interactions.

Participation

In every tutorial the students, as a group, participated more than the tutor. This compares favourably with Wun, Tse et al's study where this only happened in 37% (17 out of 46) of PBL tutorials observed (Wun, Tse et al., 2007), and is surprising given the reticence of the group to speak out. Furthermore some of the students in my group individually spoke more than the tutor, such as Jay, Joyce and Emma. Being a chair was also a positive influence on the level of participation. Whilst this is perhaps not unexpected, it is worth mentioning since it does support the previous discussion that the chair is reluctant to delegate the work and fills in when silences ensue. There was no pattern of student demographic in terms of the level of participation. For instance the highest participators displayed a range of variables related to gender, age, ethnicity and educational background. Similarly, students in the lower participation groups displayed a wide range of demographic variables. But does level of participation necessarily correlate to learning? Similar to that of Blue, Stratton et al (1998), my study showed that participation rates were not indicative of academic success. Although none of the higher participation students were academically weak, as judged by their subsequent progress

on the course, there were also students who progressed well but whose level of participation was low compared to the rest of the group, such as Anne. Of interest to this study are two other concepts related to participation, however: i) the change in participation rate of any one student over time and in relation to other contextual variables, since this might highlight students whose voice has become marginalised in the group, and ii) whether participation was of high quality and if this could be related to the impact of face threat over time.

Comparing the ranks of participation, i.e. the order of participation rate each week over the period of time of the study, Laura was seen to demonstrate a reducing level of input. After week 5 Laura left the programme as a result of illness. Earlier in this thesis it was shown that in learning interactions, Laura positioned herself in a subordinate manner using mitigation and apologies throughout her speech. She was also seen to be undermined by others on occasions. It is not easy to say whether her style was forming of her identity in the group or whether it was as a result of it, and of her illness. Nevertheless, her participation, on close observation may have been able to provide an indication of her difficulties. Thus, observation of changes in participation style, rather than a low participation rate per se, may be used to identify students who require support. Another interesting observation was that Ian's participation rate dropped during weeks 4-7, and Ed's participation rate dropped during weeks 5-7. During this period of time, Jay joined the group and was the most active participator. It is possible that these events were related. In an interview with Ed, the interviewer is talking about student-directedness of PBL:

> Interviewer: *"A really good PBL group is one that doesn't need a facilitator because they can spark off each other instead. So don't be frightened of taking the facilitator's role if that's what you want to do".*
>
> Ed: *"Yes, Jay is there. No it's great, you know they're all brilliant"*
>
> *Ed Interview 2*

Here Ed hints that Jay is dominant in the group. Whilst this is not an expression of dissatisfaction with Jay, the following mitigation of "no, it's great" etc is presented as a contradiction to his own statement as though his initial implication was that Jay might *not* be great. Thus issues of power and inequity that can in result in silencing of

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individuals and that have been illustrated in the qualitative observation also appear to be evident in the pattern of participation over the period of the study. For other students their rate of participation did not change significantly. For those students with consistently low participation rates, such as Den and Anne, it is more difficult to know whether contextual factors and the development of the group influenced their participation or whether their reluctance to participate was a result of their own preferential communicative style. Further research into the rate and patterns of student participation correlated to student progress may show whether PBL participation can be used as a diagnostic tool for identifying students in need of support. Certainly, Wigen, Holen et al (2003) have shown that group behaviour in PBL, as assessed by student peers, can be correlated to academic outcomes so there is potential for the PBL tutorial to yield some diagnostic usefulness as a means of formative assessment of progress.

Quality of participation – cognitive level

Quality of participation in terms of cognitive level is more relevant as an indicator of how successful the group were at achieving their learning goal. Although student learning outcomes are not the key focus of this study, if avoidance of learning at a higher cognitive level is as a result of avoiding high face threat interactions, then this is important to know. Others have expressed disappointment at the quality of student participation in PBL, noting how it reflects lower cognitive interactions referred to as cumulative reasoning rather than higher order exploratory questioning (Moust, van Berkel et al., 2005; Visschers-Pleijers, Dolmans et al., 2006). For this group, participation was also mainly of low cognitive level. Seventy per cent of interactions were in the low cognitive level category at the beginning of the year and 64% at the end of the study. PBL session 4 had the highest number of higher level interactions at just under 40%. Cognitive level did not change significantly over the period of the study.

Many of the higher cognitive learning interactions are also high rapport or face threat interactions, and I propose that overcoming face threat is the defining issue. In order to analyse this assumption, the high and low cognitive interactions were broken down further into high and low face threat. Factoring in face, as a concept, showed that

students in this group were more likely to engage in high face threat interactions only where they were required to do so to follow the stages of PBL (see pie charts in results section 4), in other words, where those cognitive activities were part of the formal process for PBL such as brainstorming ideas and setting learning objectives. These are clearly written as detailed problem-solving steps in the Maastricht 7-jump process which is used by the students (Appendix 8). However, the final feedback stage of PBL which takes up half the tutorial simply states:

Stage 7: **Synthesis and check newly acquired knowledge and information**

The newly acquired information and knowledge should be scrutinised and described in relation to the problem. The new knowledge should elucidate the problem and answer the questions put by the group.

This observation suggests PBL process itself, whilst face-threatening, also scaffolds the students to engage in higher cognitive activities than they might do alone, and that these students valued the importance of sociality rights reflected in the 7-jump process. Spencer-Oatey also found rules to be an important factor for British students in her 2002 study (Spencer-Oatey, 2002).The limited detail and structure for stage 7 compared to the previous 6 stages may help to explain why there is little in the way of engaging critically during feedback and why high face threat interactions, such as disagreement and contradiction are more easily avoided.

The ratio of high and low face threat interactions did not change over the period of the study. As a result, students appeared to engage mainly in low cognitive level interactions except where the PBL process demanded specific interactions to be undertaken. As noted, a diminishing social distance is likely to have reduced the threat of FTA. In this group, because of cultural differences, socialisation did not happen. Face threat remained high and therefore higher cognitive interactions were not attempted. Cultural diversity may therefore have been responsible for impacting negatively on the level of learning interaction.

The wider literature on group productivity which compares culturally homogeneous and heterogeneous groups is conflicting (Chatman, Polzer et al., 1998; Pelled, Eisenhardt et al., 1999).   Some studies, like mine, show that cultural diversity can impact negatively on

performance but, similarly, many studies have highlighted that, given enough time, culturally diverse groups perform just as well. Watson, Kumar et al (1993) compared culturally diverse and homogeneous student groups for task performance and showed that whilst homogeneous groups performed better initially, after 17 weeks the difference in performance between the two groups was not significant. This suggests differences as a result of diversity are ironed out after a period of time. I also observed my study group for 17 weeks, yet I saw no discernable changes in performance for this group over the time of the study. Watson, Kumar et al's group diversity was based on ethnicity only. There was no difference between students in terms of age, educational achievement and employment, and there were only 5 students in each group. I propose that Watson, Kumar et al's work supports my assertion that ethnicity could cause lack of collaboration as a result of pragmalinguistic failure over a short period of time (the lower order SIPs), but by 17 weeks such technical differences in terms of the semiotic tool of language are accommodated. Furthermore, in Watson, Kumar et al's groups, commonalities shared by the group such as age, previous knowledge, and a shared community of practice (all were post-graduates employed as managers) provided sufficient common ground for socialisation to take place and help in the reduction of social distance, thus making face-threatening demands required to achieve collaboration easier to manage.

In summary, learning interactions were generally superficial and this did not change over the period of the study. However, this has also been reported by others so more research is needed to determine the degree to which homogeneous and inhomogeneous groups differ in this regard. Nevertheless, the qualitative data certainly highlighted instances where FTAs, that might have triggered exploratory questioning, were avoided, and participation rates present some clues as to who might be more likely to withhold their views.

Research Question 4: What measures can be taken to support diverse groups of students to communicate effectively in PBL?

There are a number of observations which might give rise to recommendations for improving the effectiveness of PBL for diverse groups. These will be described with reference to high order SIPs and include: i) reducing the perceived weightiness of the FTA, ii) enhancing the sociality rules, rights and obligations, and iii) ensuring students appreciate that interactional goals should privilege learning over security.

i) Reducing the rank of the FTA

The facilitator should find opportunities to highlight commonalities between the students to develop a sense of in-group solidarity. Chatman et al showed that highlighting similarities rather than differences correlated significantly with high productivity in culturally diverse groups (Chatman, Polzer et al., 1998).

The tutorial structure should also provide opportunities for PBL groups to engage in socialisation, for instance, encouraging off-task interactions and incorporating refreshment breaks for long PBL sessions. FTAs also appeared to be enhanced in the presence of a tutor,

> *"well actually when [facilitator's name] goes out or something and I find sometimes I can let my hair down"*
>
> *Ed interview 2*

and Duek also found tutor presence to negatively impact the performance of some students (Duek, 2000), especially females and ethnic minority groups. Therefore, to eliminate facilitator-related anxiety associated with 'getting it right', PBL tutorials might be designed so that sections are conducted without a tutor.

Students should be encouraged to feedback in a way that is suited to their own learning approach so that they are not straight-jacketed by a fear of adhering to process,

> *"it was a bit un-nervy that because I wasn't really sure what to do you know, what to say or when to say"*
>
> *Marian interview 1*

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However, students would need to be provided with examples of the use of creativity in PBL. A number of groups have begun to explore and report more creative approaches which include drama, the use of collage, and information technology such as second life and wikis (Arkell, Dudley et al., 2011; Matheson, 2011). In the institution where this study was conducted, we have begun to employ wikis to great effect. One of the benefits highlighted by the students is that wikis enable students, who find speaking out in PBL difficult, to present their work (Sykes, Robinson et al., 2009), thus promoting a more inclusive approach to learning opportunities.

ii) Enhancing sociality rules

Having made recommendations for a loosening of procedure to enable creativity, it might seem surprising to argue for a more structured PBL process. However, there was evidence that, when faced with decisions that involved acting outside of process some dissonance occurred as reported on page 105. Sociality rules associated with roles also legitimises status power, which was useful for sanctioning students to practice leadership skills. Furthermore, being required to engage with specific stages of a problem-solving approach did force students to engage in higher cognitive level interactions such as brainstorming.

One suggestion for improving the 7-jump model in this regard is to ensure feedback explicitly incorporates, and therefore legitimises, critical appraisal of the input of others. It also needs to incorporate 'summarising' and 'reflection', which are currently not referred to in the model but have been shown by others to be crucial for PBL (Moust, van Berkel et al., 2005). An adaptation of the 7-jump model guide might therefore include the following further breakdown for students for stage 7 (figure 36):

Stage 7: **Synthesise and check newly acquired knowledge and information**

The newly acquired information and knowledge should be scrutinised and described in relation to the problem. The new knowledge should elucidate the problem and answer the questions put by the group. The following stages will help provide a critical approach to feedback:

- Nominate students to **start** the feedback on each objective.
- Other students should be asked in turn by the chair if they have anything **further** to add (this should not be a repetition of what the first student has said)
- Following the feedback, the group should conduct a critical discussion by asking:
  - Have a number of sources been used to provide the information?
  - Are there any different opinions in the literature/resources regarding the objective?
  - If so, why might these differences exist?
  - Based on the group's critical review of the information the chair should summarise the learning associated with the objective?
  - In what other ways/situations might this learning be useful?
  - The chair should go round each person in the group to allow them to provide an opinion before moving on to the next objective.

Figure 36: Suggested breakdown to provide further structure to feedback, stage 7

Rules and roles are therefore important for facilitating essential stages of the learning process which new students may not be aware of, and for legitimising role status. It is probably likely that different groups will have preference for either a freer or more structured process, according to their developing group ethos. More work is needed to explore what works best in what groups and how this can be identified.

iii) Interactional goal

What constitutes the interactional goal is determined by the unit of analysis. At the macro level the goal is for students to achieve the learning outcomes set each week, whereas at the micro level it is related to the cognitive value of each utterance. Students

appear to put greater emphasis on the former without realising the value of what they say in interaction as constituent of their learning. Ian's description of PBL typifies the explanations also given by other students,

> *"problem based learning. It's by given like a scenario or like at the moment it's a series of images and we have to come up with some learning objectives. And we have lectures throughout the week and it helps to tie together all the lectures and we do our own research as well. And we form our own conclusions which we feedback to the group"*

<div align="right">

Ian Interview 1

</div>

Implicit in this statement is the notion that PBL is about bringing information back to the group, rather than about constructing knowledge together as a group. In this regard, it is easy to see how students might believe that not to do the FTA is of little consequence, since the learning has already happened during the independent study. It is therefore important that students are made aware of the underlying philosophy of constructivist learning approaches, and not just the mechanics or the stages of PBL. This was also highlighted in a review of the shortcomings of PBL by Moust, van Berkel et al (2005). The aforementioned suggestions concentrate on getting the students to 'take the plunge' and tackle FTAs by seeing them as important for their learning. They may need support though to manage these tricky communications and consideration should be given to providing groups with communication skills training. These would cover: social, (e.g. conflict management strategies), cultural, (e.g. covering socio-pragmatic and pragmalinguistic differences), and academic (e.g. how to construct an academic argument (Andriessen, 2006; Claudia von Aufschnaiter, Sibel Erduran et al., 2008) requirements for effective PBL interactions. Such approaches have been advocated by others (Blue, Stratton et al., 1998; Do and Schallert, 2004; Woodward-Kronn and Remedios, 2007; Fergy, Heatley et al., 2008).

Conclusion

By way of a theoretical conclusion I will return to the final stage in the GT generation approach:

Stage 4: Core category and theoretical conclusion

In accordance with the principles of GT (Strauss and Corbin, 1990) at this point, a core category or phenomenon is established to which all categories identified at the axial coding stage are related; this is known as selective coding. The relationship of these other categories is such that they construct an argument around the core phenomenon. In other words, codes or categories developed at the axial coding stage are not merely hierarchical categories of the original codes but are concepts that can be logically linked together to describe the subject under study in relation to the core category or central idea.

Core Category: socio-cognitive nature of learning interactions

Collaborative learners are required to communicate reciprocally in order to engage in learning. In these communicative interactions they often have to balance the two competing social and cognitive interactional goals. In achieving the social goal the cognitive one may be threatened, and vice versa, and interactants make choices about which of these goals is most important. I have called this the socio-cognitive nature of learning interactions. The following draws together the axial coding categories to argue this point.

Context category: Unique interactional demands of PBL

The type of collaborative learning method is essential to the context in that it dictates a specific range of activities and roles, within which the learners are required to communicate. For example, it determines the degree of collaboration expected, and the number of occasions in which students have to make choices about communication. PBL requires students to engage in face-threatening behaviours to a greater extent than more traditional learning methods, both in

terms of face threat to self and others. This is because it expects the students to postulate theories about subjects of which they have no, or little, prior knowledge and then puts student centre-stage for planning learning objectives, and delivering the learning to others. Furthermore, students are expected to embark in argumentative discourse to arrive at learning which is negotiated and constructed from multiple perspectives. Interactions are therefore demanding and require confidence and skills in communication. Furthermore, PBL makes demands on the higher order cognitive processes which are not usually expected at level 4, such as synthesis of discussion. Engaging verbally at this level in front of others, adds to the impact of the face threat.

Causal category: cultural diversity

Inhomogeneous learning groups, which contain individuals from diverse cultural backgrounds, may have difficulty in finding a common strategy of communication for PBL. This is because their cultural differences make it difficult to predict how they will be judged by others. Pre-existing, taken-for-granted assumptions govern predictions about communication and this can perpetuate stereotypical identities which marginalise some students from the outset. Reducing social distance, which would overcome this dilemma, is more difficult in groups where the individuals are culturally diverse because socialisation does not happen naturally. Diversity thus impacts not only on linguistic understanding (understanding at the semantic level) but on the socio-pragmatic approaches that determine the way the group develops.

Strategies: FTA avoidance

These conditions establish a group ethos of autonomy, rather than imposition, with a preference for avoiding face threat except where the rules and processes associated with PBL demand a particular interaction. Where FTAs are attempted, the way they are mitigated can vary according to the cultural background of the speaker. This highlights differences in linguistic politeness strategies which can be

misinterpreted as subordinating moves, and can create power differentials, further influencing the developing ethos of the group. Thus in performing PBL the group runs the risk of perpetuating the social distance in a kind of negative feedback loop. However, students share a common identity associated with being a student in the same group going through the same personal and professional developmental process. This appears to foster an association-attachment ethos and a preference for the more supportive but superficial face-enhancing learning interactions. In such a situation, and over the period of time investigated, it appears argument and conflict will not flourish.

Consequences: lower level cognitive learning interactions

In culturally diverse groups there is the possibility that an association-attachment / equity-autonomy ethos will guide the group. In this situation, students are supportive of one another but this appears insufficient to overcome the avoidance of face threat. Even simple cognitive communicative acts, such as making statements of fact and reading from texts, can be difficult. Students, instead, opt for those interactions which are confirmative rather than conflicting described by others as cumulative reasoning. It appears the strength of FTAs in PBL is extremely high for such a group and that the impact of socialisation for reducing social distance, inhibited in culturally diverse groups, must have an extremely influential role in reducing the impact of face.

Not all students in a group will act the same. Although their communicative actions may be tempered by the overarching ethos there are some who will embark more in FTAs and higher cognitive processing interactions. Differential rates and quality of interactions may be correlated to different student demographics giving weight to the argument that certain groups of students may need further support to be able to benefit from collaborative learning. At the very least, students in diverse groups need to talk about their differences and similarities, and to discuss their differential approaches to communication, to arrive at an agreed strategy for Managing Rapport.

Key findings, recommendations, and further study

The discussion covered each research question in depth and this was followed by a conclusive argument, which drew together each of the GT categories to create a final core category. By way of summary I now present the key findings or 'take-home messages' from this research. For each of these I also present recommendations for applying the findings to practice and identify areas for further research.

Key finding 1: PBL is a socially complex learning approach.

Viewed from the student's perspective, PBL is socially complex, being littered with FTAs which are often avoided. PBL has never been described using face as a concept before and this provides a new insight into how difficult PBL can be. Failure to recognise this, and to support students in negotiating these complexities, may limit the value of the learning. Despite this, students did engage in some higher order learning and skills. The study therefore concurs with the literature in showing PBL to be a potentially valuable learning method, providing students with the opportunity to demonstrate higher order cognitive processes and develop learning and employability skills such as objective-setting, chairing and leading which are not encountered in more formal, didactic modes of learning. I suggest that when this study group did engage in FTAs, it was mainly as a result of the tightly structured and scaffolded PBL process which made higher order cognitive interactions an explicit requirement at each stage, and legitimised face-threatening interactions. Such tight structuring might not work for all groups, however.

Key Finding 2: cultural diversity has the potential to negatively influence the learning interactions in a PBL tutorial setting

Cultural diversity has the potential to negatively influence the learning interactions in a PBL tutorial setting. Qualitative data suggested that this was related to concerns with face, which appeared to be enhanced as a result of cultural strangeness, leading to unpredictability and stereotypical assumptions of how an utterance would be received.

Key Finding 3: Students from both older and younger groups have preconceived notions of age, which can negatively influence learning interactions

Socio-pragmatic misunderstanding associated with the symbolic power separating sub-cultural groupings is deep-rooted. In particular, my study showed that students, from both older and younger groups, had preconceived notions of age, which impacted negatively on learning interactions.

Recommendations

The recommendations to be drawn from these key findings are inter-related. Academics who design and deliver curricula predicated on a socio-constructivist learning approach, such as PBL, must consider the social aspects of learning. Furthermore, in diverse groups, consideration needs to be given to ways of enabling students to develop cultural sensitivity towards their learning partners. My study showed that this will not happen naturally without intervention as students gravitate towards other students with whom they identify outside the classroom. As Baron and Kerr (2003) acknowledge, reducing inter-group conflict, which is based on stereotyping is "no simple matter" (p166). Whilst this group did not exhibit overt signs of conflict, stereotyping was responsible for pragmatic and goal failure. However, a number of approaches framed around Tajfel and Turner's social identity theory (Tajfel and Turner, 1986) of in-group preference and out-group prejudice might be proposed. These approaches include i) de-categorisation, where the emphasis is on individualising people rather than seeing them as members of groups, ii) cross-categorisation, where individuals find in-group commonalities based on a number of alternative categories to which they might belong, and iii) re-categorisation, where the new group forms its own in-group category. These principles might therefore be applied to the PBL group in the following way: i) provision of social opportunities for students to develop friendships and identify pre-existing common interests, ii) opportunities to share, and reflect on, new experiences which contribute to the developing culture of their own in-group, such as PBL activity itself and/or clinical practice, and iii) identification of the unique characteristics of each student so that they

are seen as individuals rather than as a representative of some out-group that they may occupy (Gaertner and Dovidio, 2000). The tutor also needs to be able to identify and tackle inappropriate out-group prejudices and encourage students to see other group members as individuals.

It is recognised, however, that facilitating social intercourse between out-groups, such as students from different generations, is an ambitious challenge. Therefore, in order to motivate students to engage socially, it is essential that they are provided with a rationale, to make them aware of the pedagogical importance of socialisation for effective learning.

Future research

As mentioned above, when students in this group tackled FTAs, it was mainly as a result of the tightly structured and scaffolded PBL process which legitimised certain roles and interactions. Such tight structuring might not work for all groups, however. It has been suggested that the usefulness, or otherwise, of procedural guidelines may be related to the longevity of the group and how experienced its members are at PBL, so that for a new PBL group scaffolding and structure is more important (Moust, van Berkel et al., 2005). However, as my study has shown, group ethos may also be a determining factor. In this group, for example, an ethos of equity-autonomy, which was an outcome of cultural diversity, meant that procedural rules were important. More research, therefore, needs to be undertaken to identify which groups flourish in which kind of environment and how a facilitator can determine the degree of freedom-versus-constraint appropriate for their particular group.

There appears to be a dearth of literature on the impact of age diversity in adult classrooms. Although, ageism research has been carried out to determine the level of threat a generational group assumes is posed by another (Abrams, Eilola et al., 2006) at the wider societal level this has rarely focussed on the unique context of work or education. It is possible that both older and younger generations may have (differing) concerns regarding the impact of another generational group on the developing culture

of their community of practice. Therefore, this type of ageism research might be usefully applied to the intergenerational classroom to better understand the tensions that could exist.

Limitations

In this final section I pre-empt potential criticisms of the study by: i) providing further detail to support the rigour with which GT has been applied, ii) acknowledging the contextual boundaries and iii) considering the relevance of flux in the sample group.

Methodological criticisms of Grounded Theory

GT is not without its critics and a number of authors have expressed concerns as to its precision in terms of validity (Chiovitti and Piran, 2003; Thomas and James, 2006). This may therefore be seen as a limitation of the methodological approach rather than of the methods of this particular thesis, nevertheless in the following I address such concerns.

Criticisms relate to the claims that in GT, theory can 'emerge' from data without significant interpretation by the researcher (Thomas and James, 2006). Chiovitti and Piran (2003 p430) suggest 8 ways in which users of the GT approach can enhance rigour in their study. These suggestions are indicated below (in italics) followed in each case by illustrations from my own study of how they were satisfied:

> (1) *Let the participants guide the inquiry process:* This I achieved through the evolution of the individual and focus group interview schedules. I allowed each set of interviews to drive the focus and structure of the next, and the framework of RM came from students' continual reference to the group as polite and respectful. This then underpinned the framework for discourse analysis of the video footage. In terms of coding categories, minor codes generated to create the axial codes were labelled using verbatim words.

> *(2) Check the theoretical construction generated against participants' meanings of the phenomenon;* the key study concepts were checked against the students' understanding; as can be seen from the interview schedule (Appendix 5) my first

question was designed to elicit each student's understanding of the term PBL. However, as the study evolved and new concepts were introduced to help understand and construct theory, these new concepts were not checked with students. This was a deliberate decision. Firstly, because students did not want to see themselves on video yet I would have had to show the students their video footage to illustrate and justify my interpretations. Secondly, I believe such a move could have been construed as unethical because the study did unearth some negative findings related to power and marginalisation within the group and this impacted, to some extent, on group and individual performance. A reflexive turn of this finding back to the group would also have impacted negatively and unnaturally on the developing group ethos. Furthermore, it is unlikely that students would have admitted to these failings to a tutor as it would have shown them in a bad light, so just what value such a move would have made, in terms of validating my findings, is questionable.

(3) Use participants' actual words in the theory: The participants' words have been used in the word-for-word citations included in the thesis. Furthermore, where DA has been illustrated, Sacks, Shegloff et al's (1974) transcript convention has been used and this includes reference to vocal, non-verbal (e.g. laughter), and non-vocal, non-verbal (e.g. body language) aspects too. Participants' words are not directly used in the theory presented in the final conclusion on pages 190-192. However, their words led me to the politeness and RM literature and this has been used in the theory.

(4) Articulate the researcher's personal views and insights about the phenomenon explored: these issues are explored in the reflexivity account which also explains how my views and insights changed throughout the period of the study and thus influenced my subsequent impact on, and interpretation of, the study, in what Geertz refers to as a 'reflexive turn'(Geertz, 1990).

(5) Specify the criteria built into the researcher's thinking; throughout the study I have explained how the codes have been combined to create axial coding categories. I have also included the notes made during this process which capture my thought

processes and explanations about why certain codes have been merged and others have been reified (see Appendix 7).

(6) Specify how and why participants in the study were selected: This has been thoroughly explained in the methodology in section 3.

(7) Delineate the scope of the research: the scope is set out in the aims and research questions which have been used to justify the study design. Issues of generalisability, which consider the scope of *application* of the findings are discussed in a separate section next

(8) Describe how the literature relates to each category which emerged in the theory; the results are reported in explicit sections according to the categories of GT (i.e. Context, Cause, and Strategy). Within each of these, the literature is used to embed the work in what is currently known about these categories, for instance, PBL as a context, non-traditional students and diverse groups as a cause, RM as a strategy.

Thus the responses above do not represent limitations but rather address potential criticisms of the study as a result of using a Grounded Theory approach.

Situated or generalisable?

Next I will consider how the situatedness of the knowledge created from this study might limit its application to other contexts. In particular, I will look at i) the discipline of radiography, and ii) the concept of cultural diversity.

Radiography-specific features

Although the study group comprised radiography students, this research has not focussed specifically on the discipline of radiography. Instead the focus has been on how learning is constructed in communication, and in this regard the subject has been secondary. Nevertheless, it is important to acknowledge the features of the radiography context which may have influenced the findings of the study and their relevance to other disciplines.

Because radiography at the study institution recruits a wide range of student ages, the sampling strategy has been responsible for unearthing age as an important influence on communication. This was fortuitous, however sampling bias needs to be considered in the discussion of generalisability to other contexts. The national statistics for radiography recruitment show that cohorts with high numbers of mature students are not only specific to the study institution but are a feature of the discipline (Henderson, 2009). Thus the findings of the study will have implications for the majority of radiography programmes in the UK. Furthermore, other allied health programmes also tend to attract mature students, so the findings related to age are also applicable to wider set of disciplines. In 2002, Ross, Archer et al showed these to be Business and Management, Performing Arts, Mathematics and IT (Ross, Archer et al., 2002) as well as other subjects allied to medicine.

A second important feature of radiography which might impact on the generalisability of the findings is that it is not a traditional academic subject and it is therefore not taught in schools or colleges. As a result, students are likely to have little prior knowledge of the subject. Expecting students to recall and use prior knowledge when little exists constituted an FTA, even though the presentation of the problem before the learning is a feature of PBL. The results may have been different in another discipline group, where the students are already familiar with the subject.

To add further complexity, because of the diverse educational experiences of mature students attracted to radiography, and other disciplines that recruit mature students, it is possible that some students would have higher degrees, and this was certainly the case in the small cohort in this study. Perceptions that others have more knowledge in a subject enhance the weight of the FTA. Again, if the study had been conducted with students presenting with similar educational backgrounds the results might have been different.

That the study focussed towards radiography as a subject is not therefore a limitation per se but it is important to realise that other issues may have been unearthed in other disciplinary contexts.

Sub-cultures versus national cultures

The current study has concentrated on sub-cultures of society within the north of the England. How applicable might the findings be when diversity is scaled up to consider macro-levels of culture that exist in the international classroom? Over the past three decades the number of international students worldwide has more than trebled from 0.8 million to 3 million, and this is only set to increase further still. For example, the UK Government has established an aim of making the UK the global leader in international education (Archer, Davison et al., 2010).

It is envisaged that in PBL groups where students are internationally diverse, there is likely to be a greater emphasis on pragmalinguistic failure than in this study group. However, the potential for international stereotypes will present similar socio-pragmatic problems. There will also be a requirement to ensure academics are equipped to understand the specific needs of international students, and for such students to be adequately prepared for the cultural differences between learning in their own and other countries (Lammy, 2010).

Silenced voices

Four students took an interruption during the period of the study; Laura, Den, Pam and Jay. It is probable that the presence and absence of these students would have influenced the developing group ethos but exactly how it is impossible to know. I am satisfied that the reason that the students withdrew was not related to PBL, the group or the research study and I can be confident of this because, as year tutor, I was made aware of the circumstances surrounding the students' decisions to interrupt. Furthermore, all students returned the following year to resume their studies once their personal difficulties had been overcome.

I have not included an analysis of the facilitator's perspectives. This was a deliberate decision since I wanted to foreground the student experience. Nevertheless, this omission excludes the perspectives of another important player in the PBL tutorial.

Because I recorded the observational data I have the opportunity to return to analyse this further should it be necessary providing ethical approval and consent are granted.

Summary

Limitations notwithstanding, this study has provided a rich description of how students experience PBL. Using RM as a means of analysis has provided an alternative lens through which to understand the pressures for students engaging in constructivist learning activities and the communicative demands we place on our students. It has also shown that, if we provide students with the appropriate support and optimum conditions, PBL has the potential to develop the necessary interpersonal and communicative skills needed for learning and not just discipline-specific knowledge. Such support would need to consider the social and emotional preparation and development of the group, and not just the individual. This is required to ensure students feel sufficiently comfortable to face new challenges and to encourage and support others through those challenges too. It is beholden on the facilitator to eke out barriers to the social development of the group and to challenge prejudices and stereotypes that might marginalise individuals and stop the group moving forward in reaching their learning goals. This is particularly the case for culturally diverse contexts which are likely to be a feature of 21st century classrooms, be they real or virtual.

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Appendix 1: Transcript Conventions

Transcription conventions described by Sacks, Schegloff and Jefferson (1974)have been used for illustrating interactional analysis. These conventions have been further described and elaborated with examples and illustrations by Emanuel Schegloff on his UCLA webpage (Schegloff, No date). The conventions have been limited to those felt to be important for this study. The following extract contains illustrations of the conventions used and these are explained below.

```
1 Pam      it's it's it's gonna be ((flexes arms round back of head with face slightly down and tugs on
2          ponytail)) slightly biased though °isn't it ° they're wanting you to (0.1) go to them (.)
3          they're gonna swing it their way aren't they ° (1)  °don't you think° (0.5) it's not (0.1)
4          gonna be(.)_as (.)((pulls down on front of jumper)) good as what you're gunna get off the
5          ((scratches her  back)) nhs (.)  direct website °and stuff like that° (.) ((looks at tutor)) I
6          don't think =
7 Jay      = well I I disagree with that  because I know erm I know one of my friends he had really:
8          bad dermatitis and went to ( ) everybody and couldn't get it sorted out and went to a
9          traditional Chinese=
10 Pam     = yeah I understand [what you're saying ((scratches brow))
11 Jay                         [you know practitioner in London and he was sorted  (0.5)
```

1) Turn-taking and sequence events

For recording over-laps, square brackets have been used to indicate where the overlaps occur in the original speaker's utterance. In lines 10 and 11 in the example, Jay interrupts and overlaps Pam when she says "what"…

Where there is no perceivable space between two speaker's utterances (also referred to as latching), a = sign is used. This is seen between lines 6&7 and 9&10 in the example.

Where a pause or silence occurs, the length of the silence appears in parenthesis in tenths of a second. So for example, in line 3 there is a 1 second pause after 'they', then later a 0.5 second and 0.1 second pause. Where there is a slight pause, but one which is too small to measure, the symbol is (.).

2) Aspects of delivery

Where the volume increases, or tone changes, to provide stress to a word or syllables, these words or syllables are underlined as in direct, on line 5, where the stress is on the first syllable. Where a word or words are spoken particularly loudly they are in upper case (no examples in above sample).

Where the volume decreases, a degree sign is placed in front of the word affected. If there is a longer passage, two degree signs are used and the words in between the two signs are all affected as in line 5 above.

Where words are elongated they are followed by a colon:, the longer the elongation, the more colons are used, as indicated on line 7 after the word really.

A *h* in parenthesis indicates an explosive aspiration such as a sigh or laugh. More extended laughter is indicated in double parenthesis as transcriber comments (see below)

3) Transcriber comments

Where the transcriber has made an observation about non-verbal interactions (e.g. body language) or non-linguistic sounds (e.g. coughing), the comments are placed in double parenthesis. This can be seen in line 1.

Where the sound is unclear and the transcriber is unsure of the word, single parentheses are used which are empty.

Line numbering has been used when the thesis has made reference to specific lines of speech in the text, otherwise no line numbering has been used.

Appendix 2: The model of PBL used for Diagnostic Radiography at the study university in 2007

- Small student groups (10-12 students per group) configured by the year manager at the beginning of the year (5 groups in total)

- One facilitator per group

- The PBL group stays together for the whole year but has a different facilitator for each semester/term.

- Students have one module per semester (approximately 8-10 weeks)

- There is one trigger per week and this integrates a range of syllabus content and clinical sciences. E.g. a trigger might include anatomy, physics, radiographic technique and patient care. (See appendix 9).

- Triggers are presented in various ways and may be digital images, video clips, case studies, x-ray images and x-ray request forms

- A PBL session lasts for three hours during which time the students will feedback on the previous week's trigger (typically 2 hours) and work through stages 1-5 of a new trigger (typically 1 hour)

- Students use the Maastricht 7-jump process (see appendix 8)

- Students are provided with a number of 'fixed' resources. These are key note lectures and tutorials which help the students work through some of the broader concepts related to the trigger but do not provide specific 'answers' to the trigger itself.

- Blackboard Virtual Learning Environment is used to provide additional resources, readings and links to help direct student learning.

- Students produce a group learning agreement at the beginning of each semester where a number of ground rules are agreed. This includes issues such as what to do if you are going to be late and how to tackle unruly or non-participative behaviour.

- Students agree to take turns in being chair and scribe

- There are no rules about how feedback is to be done (e.g. should it be formal presentation)

- Students should reflect on their performance at the end of each session

- Facilitators have a guide which includes the areas students should cover and the proposed learning objectives they should arrive at. Students do not see these objectives but know that the facilitators have them.

- Assessments are held at the end of the semester and these are individualistic in nature and marking. There are no group assessments or marks.

- The whole curriculum is therefore based around this hybrid model of PBL except for the final semester of the three-year programme which is individual project/research work

- Students are prepared for PBL in their induction, which includes a 'fishbowl' demonstration by third year students and a practice trigger.

Appendix 3: Reflexive Account

The main instrument in participant observation studies is the researcher. As a non-objective instrument the researcher poses a potential source of subjectivity and bias at a number of stages, i.e. the data they choose to record and the skills with which they collect this; their choice of analytical and interpretive framework; and their choice of discourse in the textual (or other) representation. It is therefore important for the researcher to declare their stance in their report through the process of reflexivity (Sparkes, 1992; Chiovitti and Piran, 2003). Furthermore, as a human instrument, the researcher is subject to changes in attitude and approach brought about by participating in the research itself, such a change in turn reflects back upon subsequent interactions with, and interpretations of, the data in what is known as a reflexive turn. In this way Scholte (1999) argues that subjectivity may thus not be a limitation of qualitative data analysis but rather an enriching feature as the researcher becomes more able to understand the context.

This section therefore aims to explain how I, as the sole researcher, may have impacted on the study. I will start with a brief explanation of my position as participant/observer in the research. I will then go on to provide a description of myself including visible identifiers, beliefs, skills & knowledge and roles. Finally I will present a reflexive explanation of how these features may have impacted on the study.

Participant or observer?

Researcher position should be determined by methodological ideology. As detailed in chapter 3, methodologically my study is in the manner of an ethnography. According to Wolcott (2009) ethnography is a branch of field study which in turn requires a participant observation approach. To ensure what Hammersley and Atkinson refer to as ecological validity (Hammersley and Atkinson, 1995), my presence was essential to obtain a better understanding for how the context impacted on and was created by the participants. Lofland and Lofland (1995) agree that 'involvement and enmeshment rather than objectivity and distance' are the aims of field study and even go so far as to state that objectivity in the field will result in worthless data.

In addition, my level of participation and degree of presence was dictated by the practicalities of studying a student group with whom I worked. I was part of the context. My presence would be bound to influence the participants to some degree and it was important for me to identify how this might affect the findings.

Description of my presence

My physical identity

I am an able-bodied, white British, female in my late forties. I have no particular identifying features but I have a strong local dialect. I also have a tendency to speak too fast which may be a sub-conscious belief that to speak up imposes on other people's time, a feature which has been attributed to lower social classes (Brown and Levinson, 1987).

My Roles

At the time of the study I had been working at the university for 8 years. I had the title of senior lecturer and was the first year manager of the BSc (Hons) Diagnostic Radiography Programme. In this role I was the personal tutor for the study group. If they had any personal difficulties I was their first line of contact. During the period of the study some of the study group students did indeed come to see me regarding significant personal difficulties which resulted in four of them interrupting their studies.

During the period of data collection I did not teach the students in year one and was not normally a PBL facilitator for either of the year one modules. However, due to sickness, I was called on to act as facilitator for the study group during week 5. I was not involved in assessing the students for the modules which I was observing.

My knowledge, skills and beliefs

I qualified as a diagnostic radiographer in 1983 and practiced for 16 years before joining the university in 1999. I specialised in Magnetic Resonance Imaging (MRI) which was the higher technology end of the radiography examination spectrum. Since joining Higher Education as a full time member of staff I have not practiced radiography and I would identify myself now as a lecturer rather than a radiographer. Although I am involved in some didactic teaching of knowledge and skills related to radiography and MRI I am becoming more practiced at facilitating groups of learners to learn. The focus of my attention, and interest, is diverted towards their learning processes rather than the topic which the students are learning. I am a strong advocate of constructivist learning methods and in particular PBL. Students are aware of my bias towards PBL because of the way I talk about it: frequently and with passion.

As a radiographer I worked in a number of different contexts which informed not only my skills but my beliefs. In particular, three years spent in Saudi Arabia gave me a deep, although perhaps biased 'ex-pat' understanding of life in another culture. This experience helped me to appreciate that life could be lived and understood through a completely different set of beliefs and perspectives and moved me towards a relativist ontology. This was a significant personal ontological shift having been brought up as a daughter of an ex-army sergeant major with a very autocratic, disciplined and singular view of the world. Although my father's discipline provided me with a deep-seated ambition and need to succeed it did blinker my perspective of other ways of being. The decision to embark on this area of study is thus influenced by my personal desire to learn more about how other people 'do life'. My mother is the antithesis of my father, being less judgemental and more positive in her approach to life. As a result of my mother's influence, I would also describe myself as having a positive and relaxed demeanour, and do not let setbacks get me down. Both these personal attributes, disciplined on the one hand and calm on the other have enabled me to take a measured and dispassionate approach in undertaking this doctoral work.

Research Skills

At the time of the study my research skills were limited to a narrowly-focussed and scientifically-based Master of Science degree. This was a quantitative study where I learned to manipulate numbers to demonstrate comparisons between reporters of scan images. Before this study I had very little experience of conducting interviews and analysing qualitative data.

Impact of the above factors

I now intend to consider the impact of the above factors on three aspects of the study: i) my influence on interview and observational data ii) the decisions I made about which data counted as significant and worthy of discussion and iii) the interpretations I made of that data.

i) My influence on interview and observational data

Student reporting information to me

For triangulation purposes and to enable individual students to be given an opportunity to present their opinions in confidence students were given the opportunity to speak to me through a series of what Spencer-Oatey calls metapragmatic interviews (Kasper, 2008).

However, as I was a tutor students would perceive me to possess status power in this role so did the students really tell me what they thought or were they conforming to their own pre-conceived ideas of what they thought I wanted to hear? Lofland and Lofland identify this potential for misreporting as "social locational skewing of reported opinion" (Lofland and Lofland, 1995), where relationships between the reporter and researcher might influence the veracity of representation.

For instance, students were aware of my bias towards PBL which may have influenced their freedom to talk negatively about this learning method. I addressed this by being open in the way I worded questions and explicitly gave them the opportunity to be critical. In the following extract Jay has just given me a textbook explanation of what he feels the advantages and disadvantages of PBL to be but by challenging his response Jay is then enabled to relate the learning process to personal experiences which provides more insight,

> *Me:*   *I mean that's what the theory says as well. So I don't know whether you're telling me is what you're feeling.*

> *Jay*   *No, that's actually how I'm feeling. It's definitely. I mean it's the first time I've ever done this actually. I've taught GNVQ students and it's been very similar but then the objectives that are given to you and then they go off. But this is actually producing the objectives it's one step earlier. It's actually more motivating because you can tell from the way the group is actually you know, going away and you know, perhaps you can view it in your video sessions obviously more motivated than they would be. Probably be more slouched if it was a normal lecture.*

> *Jay's interview 1*

In addition to social locational skewing, my lack of experience in interviewing may have impacted on the quality of response in earlier interviews. I was occasionally naïve in both my choice of words, which may have lead the students' responses, and my premature interjections. In the

following question I have clearly inadvertently identified my own stance through the use of the adjective 'old' in reference to traditional styles of delivery,

Me: *"So, why do think that we've introduced it onto our programme and that we don't have the old traditional way of just giving you lectures every day".*

I had a dual role as interviewer and tutor. Coffey(1999), identifies this problem and suggests ethnographic fieldwork raises personal, emotional and identity issues for the researcher. I was unable to detract myself personally from the students I was interviewing, especially those who appeared to be very quiet on the observational videos. I tended to want to fill the silences which I anticipated would happen and thereby prohibited or guided their participation. Others who I knew to be lacking in confidence were praised and encouraged for their responses which may have influenced their subsequent choice of topic. Furthermore, when students expressed doubt about some aspect of PBL I wanted to respond to their concerns. I felt I had a moral obligation to ensure that students' doubts were addressed immediately and thus I stepped out of interviewer role and into tutor role on occasions,

Me: What is it you found hard?

Ian: *Just not being used to chairing it. I've been in a PBL group before where the lecturer was the chair and we all, he kind of co-ordinated it, but it's hard to actually erm direct people and lead the group when you don't really have that much knowledge.*

Me: *Sometimes it's like going into a meeting I always say, just the chairperson is in the best position cause they can get everyone else to contribute and just sort of a bit like a conductor in an orchestra, you're not actually playing an instrument you're getting everybody else to do the work. It can be the easiest part the chair but you can feel that the spotlight's on you and you've got to get it right don't you.*

Ian's interview 1

In this extract Ian is expressing his concern about the role of chairing in PBL. This is an important point as it indicates that chairing may be construed as face-threatening by the students which would help to direct my analysis. My response is to attempt to alleviate Ian's anxieties rather than to extract further clarification from Ian. My role as research interviewer is thus subordinated to my role as year tutor. However, as GT allows the researcher to reflect on early results and change subsequent approaches dependent on these findings, I was able to adapt my style. When I interviewed Ian the second time and probed his thoughts about chairing given the intervening period of practice I allowed him to develop the theme further with less interruption from me and

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discovered that as well as lack of awareness of the process, there was a reluctance to put other students on the spot,

> Me: You had a go at chairing didn't you?
> Ian: Yes.
> Me: How did you feel?
> Me: Well I found it quite tough to be honest. When I did it, I think people just were, didn't know what to say or anything and I could feel that cause everybody just put their head down.
> Me: It was a difficult trigger you had wasn't it?
> Ian: Yes. I didn't want to put them on the spot because they couldn't have said anything to be honest.
> Me: Do you think if you'd had a better trigger you might have been able to point to people?
> Ian: Possibly yes. Plus I wasn't really used to it too much. I think only one person or two might have done it before me.

Ian's interview 2

Impact on ability to communicate comfortably

What about myself as a middle-aged white woman? Could these features impact the ease with which each student could articulate their thoughts? Individual's perceptions of their expected relationship with someone who was older/younger, of the same/different ethnic background or of the same/opposite gender would vary depending on their own frame of reference and thus impact on their level of disclosure. These factors have been widely reported as influencing communication in normal conversation (Brown and Levinson, 1978; Leech, 1980; Mills, 2003; Holliday, Hyde et al., 2004; Leech, 2005) why would interview scenarios be any different? Indeed Oakey 1981 (in Landman, 2006) writes of the importance of adopting feminist researcher approaches in interviews of women, such as presentation of researcher identity and a participatory approach to challenge the power relationships, in order to maximise sharing of knowledge between researcher and researched. Others have written of similar difficulties in research at the intersections of gender and race, Black female sexuality and feminists researching men (Hughes, 2006).

An inability to express themselves coherently may therefore have lead to some misunderstanding on my part regarding the topic being discussed. However, again, the GT approach allowed me to confirm statements made at initial interviews with the students. At follow-up, I asked them to reflect on their actual experience of PBL and whether this matched what they had anticipated. This would have helped to identify any misunderstandings in the original interview and provided

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the students with the opportunity to clarify their meanings. The following extract from the second interview with Harry demonstrates how a misinterpretation regarding Harry's concerns regarding communication were clarified and corrected,

> Me: You've got a nice clear voice on this. I was listening to it last night.
> Harry: I've got a clear voice?
> Me: You have yes, actually yes. Cos that was one of the things actually you said last time that you were worried about not being able to explain things properly to people.
> Harry: Oh, well that's not the same thing as a clear voice.
> Me: No?
> Harry: You could have a clear voice but no-one really understand what you're talking about.
> Me: Oh yes, what you're saying what you're talking about that's true. So you really didn't mean it that way you meant that you couldn't really explain things, put them into words that other people would understand.
> Harry: Explain things or put them into context or make them understand.
> Me: Do you think that's still the same or do you think it's changed?
> Harry: I don't really know, I think it's still the same.

<div align="right">Harry's interview 2</div>

My presence in the observational studies

I was present in the observational studies in week 5 as facilitator. I might have subconsciously manipulated the discussion to impact the outcomes of my study. Although I did not intentionally set out to do this, and indeed I forgot about the presence of the video recorder minutes into the session, I will have impacted on the context of the study for I am a different person to the facilitator I was replacing and I have a different interpersonal communication and tutoring style. The students would therefore respond differently to me. However, this change to the study context is representative of the changes that occur naturally; facilitators often stand in for one another on an ad-hoc basis. The way that the students cope with such changes is part of the very fabric of the learning context and is in itself worthy of analysis rather than a cause for concern. Furthermore, Pring argues that it is not so easy to change social context as might be imagined suggesting it to be as difficult as "rebuilding a ship at sea" (Pring, 2000 p108). In addition, my close grained analysis of each speaker's words, including my own, would serve as an audit of the impact of my presence as the facilitator.

ii) Which data counted as significant and worthy of discussion

Identifying the critical interactions

Wolcott (2009 p39) notes that the aim in qualitative research is to decide which of the data collected should be used, to "discover essences and then to reveal those essences with sufficient context". My observational transcripts alone amounted to some 600 pages for analysis and representation. I therefore needed to decide how many of the observational videos and interviews I was going to transcribe. Then I needed to decide whether I was going to analyse all transcriptions to the same depth.

I watched and transcribe all the videos with sufficient detail to perform a discourse analysis. Thus verbal and non-verbal communication is represented including silences and pauses. This was because I wanted to provide a rich description of the development of the group over the course of the year. Each week would vary as new learning demands were placed on the students, different students may be present and the group dynamics would be constantly changing. I also wanted to immerse myself in the data to be able to pull out important themes for further analysis. Through this intense emersion in the data I was able to identify a number of key themes which in turn enabled me to identify a theoretical framework (RM) for a more structured analysis of the data.

Once I had the transcripts I started to carry out a DA on all the transcripts using and adapting my analytical model as I progressed. It soon became clear that I had not the time resource to look at each interaction in depth and again I had to choose which excerpts to focus on. How could I do this in an objective manner, what would influence my choice? My solution lay in the responses the students had given me at interview as to what they found difficult in PBL. Thus I used the participants' accounts of their experiences to help guide me to the critical interactions. As an experienced facilitator I also had my own ideas as to when the interactions appeared to be working or not with regards to learning and felt a need to explore these further. So focussing the lens was undertaken by both insider (participant) and outsider (observer/participant) experiences.

Identifying key themes

One of the key themes to emerge was the impact of age diversity on learning interactions. It might be argued that, as a woman in her late 40's I am becoming increasingly sensitive to issues

of ageism related both to appearance and cognitive competence and that this may have made me sensitive to issues of age in the data. Yet despite feeling occasionally aggrieved by how younger people look upon the older generations, I have remained sufficiently unbiased to observe that, in fact, the younger students in this group were subordinated most often by their peers.

Conversely, I have never felt discriminated against on the grounds of my gender. Perhaps as a result of this I may have overlooked instances of gender- or race-related stereotyping in the group interactions. However, unlike age, students did not refer to these demographics as extra-ordinary in their interviews, and the quantitative participation data did not highlight differentials on these grounds either. I therefore feel confident that foregrounding age above other factors can be justified and was not influenced by my own personal perspectives.

iii) My influence on the interpretation of the data

Interpretation of the meanings of interactions is extremely complex such that Silverman (1993), suggests social research should avoid interpretation of meanings in favour of the study of practices. Other works, however, concentrate wholly on the process of meaning ascription (Jones, 2000). Nevertheless, I *did* choose to present an interpretation as this was important to address the research aim which was to not only provide a description of the context but to make suggestions for improving practice. The methodology section describes and justifies how I attempted to objectify my interpretations, and I used the RM framework to support my claims, but it is inevitable that my role as year tutor influenced how I interpreted students' interactions. For instance, as year tutor, I was aware that some of the students had significant personal problems which may well have influenced their ability to carry out their studies and participate fully in the group yet for ethical reasons I was not able to use this information. I find it difficult to be sure how much of the interpretation I put on the data was influenced by this knowledge.

Earlier I stated how I believe that, on occasion, I have been discriminated against on the grounds of my dialect and this makes me self-conscious in my verbal communication such that I can not always articulate what I want to say. In this study I have come across students who have had similar difficulties, such as Emma and Laura, and I can empathise with them. I believe this personal limitation has thus had a positive effect on the quality of the study, enabling me to be more sensitive to instances of pragmatic failure when analysing the students in interaction. What

I am unable to do, however, is to empathise fully with those students for whom English is not their first language.

Reflexive Turn

Lofland and Lofland (1995) raise issues of emotional difficulty associated with the researcher/participant role, such as issues of disclosure and the breaking of trust, dislike of the subject/persons/society being investigated and the impulse to intervene. In this they are concerned with the impact of the research context on the 'other' life of the researcher. From a personal point of view, this research has made me even more self-conscious of my own communicative style and how I present myself verbally. I am also more self-conscious of how this impacts on the impression others have of me and how my identity is constructed as a result of this. In a reflexive way, this in turn has made me more sensitive to the data I am analysing and also to the needs of my students when I am facilitating PBL.

Willig (2001) also talks about epistemological reflexivity where the researcher considers whether the research questions and the paradigms used to explore the context were the right choices and whether alternative approaches would have unearthed different phenomena. During the study I undertook an inferential analysis of the student interactions based on high and low cognitive level and face threat. I used a multilevel logistic regression analysis and identified some statistically significant differences between 'types' of students for some of the PBL sessions. The 'types' related to demographics such as: age groups; eastern/western; gender; and graduate/non-graduate. Using this positivist approach with hard inferential statistics I was able to present some interesting facts which, on the whole, supported the qualitative data yet I decided not to include this information in the final thesis. The reason was that the philosophy of grouping students into 'types' did not sit easy with me. Throughout the study I have made reference to the fact this is a diverse group of students but the emphasis has been on how diversity per se brings about interactional complexities rather than reduce individual people to categories for which predictions can be made. My approach has therefore been post-modern rather than reductionist. It was not until analysing and synthesising my work that I came to this understanding, influencing the final way I have created the narrative for the thesis and making the decision to omit the statistics all together.

Appendix 4: Photographs of Classroom Layout

Classroom set up for PBL sessions 2, 4, 5 and 9.
The person standing is the scribe

Appendix 5: Interview guidance

Individual Interview Schedule
- Ask if they want a drink.
- Explain the project, explain my role in it, explain the role of the interview in the project
- Explain the conduct of the interview:
    - Length of time
    - That there will be specific questions but the respondent can take as long as they like to answer and go into as much detail as they like
    - That their opinions and experiences are of interest, not academically-worded statements that they think we want to hear
    - That they may refuse to answer questions if they wish or ask for clarification
- Explain purpose of tape recorder and ask permission and test tape recorder
- Explain anonymity and how data is going to be stored
- Ask if they have any questions

    (Adapted from David (1960) in Lofland & Lofland (1984 p58), Gillham (2005 p 74), Spradley (1979 p59)

Establishing concepts and terminology
- What do you think PBL is?
    (i.e. working definition) Establishing we are using the same concepts and terminology

- What do you think the purpose of PBL is? (ie. What are the benefits so why is it used?)
    Establishing whether the student is working towards the same goals, processes.

Establishing attitudes and feelings
- How do you feel about PBL?
    E.g. are they starting off with positive or negative feelings towards PBL, what are their biases) – e.g. do they have any concerns, are they looking forward to it?

- How do you feel about group work?
    Are they starting off with negative or positive feelings regarding collaborative learning?

- What do you think you can get out of the group?
    Do they consider benefits to the individual or to others or both?

- What do you think you have in common with other group members?
    Establishing sense of belonging and socialisation

- Is there anything about you that makes you different from the group?
    Establishing sense of belonging and socialisation

Establishing self-perception of skills and aptitudes
- What do you think you can contribute to the PBL group?
    E.g. do they think they have good team working skills? Are they able to articulate what team-working requires? Do they concentrate on procedural issues – e.g. related to co-operative learning or do they consider group learning – handling differences in knowledge

Thank them. Ask them if they have any questions

Appendix 6: Nvivo 8 screenshot showing development of nodes around study constructs

Appendix 7: Coding Memos

This extract from my research diary demonstrates the thought processes and choices made in the process of coding on from open coding to axial coding. It appears as written, in notation form and written as personal dialogue.

Coding on
After finishing first level of coding saved this to go back to (on G and D drives and in EdD folder)
Copied into new project entitled diverse groups coded for manipulation - use this to code on so original is kept as back up if coding on is not fruitful

Steps
1) Go through each free node and
i) delete entries that don't seem to fit the title of the node well or re-code them into a different node
ii) identify if the node title is correct
iii) identify if the node needs to be merged with another or if it needs to be paired with another within a tree node
iv) identify the usefulness of the node for unit of analysis e.g
a) individual
b) group
c) PBL process
d) learning processes
e) diagnostics
(fortunately Nvivo lists interviews first then PBL sessions so we get how the students talk about the issues then evidence in practice)

Open coding in Free nodes - notes
Age - relevant for individual analysis, group analysis

Benefits of PBL related to work - probably not much use

Changes in participation over time- relevant for individual analysis and group although not many students have commented on the development of the group. May need to look at observations again specifically for this and important to include quantitative data about student participation and levels of cognitive skills and how these change over time

Communication: - relevant for individual progress and how individual's poor

communication impacts on others contributions (e.g Joyce overtalking all the time), PBL skills, learning processes, diagnostics (an IMPORTANT node)

Competition in learning- not a very populated node so not a lot of competition discussed or observed but may help to define some characters so relevance for 'individuals', see right and wrong though

Confidence - similar segments coded to communication in terms of examples from PBL observations because manifestations of lack of confidence impact on communication skills so these two are linked (perhaps join them?). Relevant for individual students. PBL skills and possibly learning processes as lack of confidence may lead them to not pursue a thought or contradict. May also impact on communication of understanding of a concept.

Defensive - captures students complaining about procedural issues which impacted on their performance, triggers, rooms, lots to learn etc. Much of this is about blaming someone or something else for lack in their own performance. Good for individual identities and maybe should be merged with this (Jay and Joyce seem to be the ones who are most defensive and this may relate to their need for approval by tutor, also witnessed in the way they look at the tutor for cues, traditional learning style and right and wrong). Also relevant for PBL processes to uncover operational issues which impact on process. But may not be WP student specific

Differences between members - some of this is related to age (keep the clip in that is related to age as this one is about Ian perceiving himself to be one of the young ones) and others is about difference without being more specific. ** mentions about being Chinese. This is useful for justifying whether students see the group as containing students who are different, so provides strength to support the sample. Relevant for study of individuals and group. Combine with 'things in common' node and subsume under opinions about the group.

Disagreement - this is how students talk about disagreement, sections from focus group rather than what is observed. Observed disagreements are coded in learning interactions under contradictions. Useful for PBL skills to show how students are uncomfortable with the idea of disagreements. Does this match what appears to be the reality as observed in the PBL sessions?

Discourse of being a radiographer. Several sections. Words used which identify them as becoming a radiographer (use of them and us) have been moved the

then and us section. The rest fall into three categories i) about using technical words in their explanations of complex radiography discipline concepts such as physics and how x-rays are produced, ii) the use of radiographical/medical terminology (jargon) for instance patella instead of knee cap where the issue is not one of complex concepts but just terminology, iii) similar to two but related to learning jargon, particularly for instance coming up with learning outcomes. Move the first to cognitive interactions and code as 'explanation'. The second and third are aspects of communication and relate to confidence. Relevant to analyse who engages, who avoids (Den and Pam), how they support and encourage each other to use the jargon, how facilitator does this, the students opinions about jargon-rich explanations is also seen in some of the interviews.

External influences - lots of issues including:
1)family commitments; children - time consuming, sharing PCs, noise and distractions; parents - elderly and dependent,
2) influencers on decisions, attitudes and behaviours towards teachers,
3) support from those at home - have they been to university, can they empathise/encourage/support:
4) previous educational experience; traditional tutor-centred methods,
5) living at home versus living at uni, distractions, the student experience, travel
6) previous job / life experiences, being a mum
7) changes in way HE is delivered in state schools/colleges, experience of group work and other student-centred approaches, class sizes, target driven
8) views of others having experienced PBL: children, peers,
9) Understanding from others regarding pressures for each other as parents etc,
10) Influence of curriculum (trigger, facilitator, fixed resources, clinical placement
(7-10 may not be just issues for WP students though). This is a large section and needs breaking into barriers and drivers perhaps. If I do this then I need to add some of the other factors into this perhaps (ability to communicate as a result of WPness). Not always impacting on the student's experiences and ability to engage in a negative way

FTAs - see separate sheet

Humour- identifies who uses humour in the group. This is Jay. Harry also uses a lot of humour. Ian, Joyce, Marian and Ed some. The younger students don't seem to have used any at all according to this node. Jay suggests in his interview not enough humour is used in the group. Ian says that the older

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students appear to have the same sense of humour as a result of their age and have stayed together after the year as a result of this. Jay uses humour to take the mickey out of others especially Harry and sometimes Ed. Joyce uses laughter a lot but not associated with funny incidents or comments, more done as a nervous response. Is humour associated with better learning interactions? Is it done to alleviate tricky face threatening occasions? Facilitators seem to do it to reduce FTAs, Harry does it as a chair to make light of his singling out individuals for feedback. Students use is as a form of modesty to protect them from imminent face threat. Is it important for effective PBL?

Individual identities- helps to demonstrate how each one engages in the PBL sessions and their progress over time. Can link some of their skills and characteristics to whether they have been successful or not and therefore show which skills and characteristics are required for effective PBL. Needs to be linked to the quantitative analysis of student participation over the stages and as the year progresses. Have hand-written these - need to type this up.

Irony - deleted or absorbed into humour

Layman's explanations - this is about how to explain things to people and the terminology used. Needs to be absorbed into communication which is then absorbed into skills for PBL. Not sure how it will contribute to the study on its own as an individual theme. Could be used to show students are still using layman's terminology at the end of year one but suspect this is not a complete node as not all examples are in here. Interesting that the students want to hear Layman's terminology and explanations from each other but not from the tutors which is therefore maintaining the 'them and us' distance.

Maintaining links after the group - change this to maintaining links outside the group meetings as some of this refers to socialisation during the period of the study. Useful for showing social characteristic of the group. They don't tend to socialise during the study although they do meet up a couple of times for a meal or drink. They don't tend to sit together in other learning activities such as lectures. After the group changes they stick together according to age. Harry comes across as the most social member as he maintains links using electronic media. Argue that this is not a socially close group and this can support the possible reason for avoidance of face threatening acts

Misunderstanding - three instances where language or accent has caused some misunderstanding and resulted in incorrect response or lack of response or

interpretation by other. Some face threat avoided as students have not addressed the misunderstanding. Need to consider if there are any other examples. This needs to be absorbed into communication

Motivation- to be absorbed into individual identities. Some of these things are also about external factors for motivation but they have been saved in external influences. Therefore delete external factors and save in individual identities to contribute to discussion regarding skills and attributes

On- stage - this could be captured in a re-coded node called attitudes or could be captured in students perceptions of PBL as it is obvious that there is an 'on stage' script which has different language and the players take on different identities and roles. Even facilitator is different on and off stage. Students talk about rehearsing their feedback and knowing when it is their turn. In social talk there is a different structure to what they say and who talks. Although they sometime also talk about learning on these occasions too. Social talk never or normal conversation does not penetrate the learning drama though. What does this mean for the study and the student's ability to progress and engage in PBL? Perhaps breaking down these barriers and getting them to see the two aspects as one would stop 'stage nerves' and encourage them to participate more especially in face threatening acts or to see those acts as non-face-threatening. Who is directing the play - the students are still looking to the tutor to be director as they identify issues not covered when the tutor leaves the room (Joyce and Ed do this on two separate occasions)

Opinions about the group - unanimous opinions that the group is a good group in terms of respect, politeness. Also talked about as a quiet group and Jay says there isn't enough humour but there is no-one with any negativity towards the group or its function. This contains what people talk about regarding the group whereas the node 'establishing group style of conversations' should be the group forming in action (delete statements about the group from that node). This will be useful in study for showing what the students value about the group and the lack of critical reflection on the group as a learning group (except Jay). So what they value in a group is harmony rather than conflict and this might impact on their learning

Other's perspective - this is more about sharing knowledge. When one comes back with something that others haven't then they share this. So it is less perspective and more knowledge. There is also some sharing which takes places because students have different way of explaining things too and this overlaps

with communication. Laura for instance refers to older students explaining things in different ways. This node could fit into sharing too. From the study point of view the skill is the ability to share (which is an attribute rather than skill) but also skills of explaining which has been discussed under communication. It also is evidence that co-construction of knowledge takes place so the PBL principle is working. Laura mentions people from different backgrounds having different perspectives too and Harry mentions how people's minds work differently therefore understand things differently. This node title might therefore be changed to **co-construction of knowledge or Learning from Each other** which is about the skills, cognitive differences, cultural and age differences and ability to explain. This is all talking about rather than witnessing. One observation item (Den bringing back Chinese herbs) but there are others e.g. Jay perspective on alternative medicine. There are also examples of each one chipping in information but it is not obvious when learning has happened within an individual as a result of that. Perhaps need to look at non-verbals such as students writing down info when another student has spoken.

Participation unacknowledged - this is for a few reasons: some students voices are not heard as they are not assertive when talking against louder more dominant students (Ed, Laura), Den is ignored often because his statements are long (lack of brevity maxim) and accent strong, Jay is deliberately ignored by facilitator in places ((im)politeness. The way this is identified is that the quieter students become quieter and their suggestions not aired or discussed in group, Den's monologues are followed by silence and students non-vernal reactions (looking bored, not writing anything down), facilitators (im)politeness identified by blanking out Jay's direct statements and going back to previous speaker. This section useful for discussion about skills needed to enable balanced communication in group and enable all voices to be heard so useful for individual level and group level analysis. Students need to be given confidence to speak out, need to not overtalk around others, need to agree on brevity, need social level of interaction which would enable face threat (e.g. to go back to Den to ask for clarification and enable Ed and Laura to say, hold on a minute, does anyone have an answer to my question etc. Could be absorbed within skills and/or communication

Personalising concepts - there are two aspects to this. The first is students using anecdote to strengthen their point. Sometime this is personal (e.g. family/college) stories and sometimes it is about what they have seen in clinical practice. The other issue is using this anecdote as evidence (esp when they refer to what they have seen take place in hospital where they are rely on what

the staff as experts are doing) thus this is replacing reference to evidence and is more apparent after placement and is also more apparent in some students than others. Pam and Jay personalise more than others. Why is this? These two students are also weaker in the feedback sessions which suggests lack of reading around the subject and the understanding of the requirement for evidence to support statements. Are they conscious of not having done the work and are they making up for this by reference to anecdote? This might be a marker for lack of engagement at stage 6.

Positive feedback - only one entry which is where I encourage them to give each other positive feedback. Spontaneous positive feedback is not apparent elsewhere (may need to check again). If this is an important area for discussion in the project need to perhaps expand on the positive feedback group discussion we had.

Previous knowledge- PBL theory suggests this is a key element of PBL (Zone of proximal development etc). Attitudes towards PK - Students appear to have different attitudes to expressing previous knowledge. They all acknowledge the importance of this. Some identify that other students have previous knowledge others talk about their own. Some talk about PK as being beneficial to themselves as individuals (Joyce, Harry) and Joyce even finds out what is on the timetable the following week and prepares for the triggers, giving them an advantage, making them feel included, others talks about it as being beneficial to the group and sharing (Den, Emma, Laura, Ian) - that PK can be shared by the group. Den talks about not telling people he has knowledge of radiography as he wants to feel the same as everyone else and wants others to have a chance.

Some talk about PK in terms of academic subject knowledge Marian mentions life/family experiences although only in relation to Joyce. Ian mentions life experiences, e.g. in a shop as important knowledge. Age and knowledge linked by some: Anne says younger students have fresher knowledge, Emma says her knowledge is 'just from college' inferring the same thing but Laura talks about older students having more knowledge.

Some students are reluctant to tell other students what PK they have (e.g. Den re Bradford and technology degree, Harry software degree, Joyce Bradford course and computer HND). It may be that they discuss it outside the group though as it is not evident on videos (students don't mention these courses) but some other students are aware of one another's PK. Perhaps students don't want to mention it in front of tutor for fear of being expected to get things

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right thus saving face. e.g. when asked by facilitator how she knows about cardiomegally Joyce says she just does. Is there also a politeness effect here - not wanting to brag, being modest.

In displaying PK there is also a difference. Some students use it to enhance face using technical terminology (Jay, Joyce). Den is unable to express himself clearly regarding his PK although this might be a communication/accent/language problem. Pam likes to link it to her knowledge of hospital based experience mentioning this many times. Others don't appear bothered about PK to either suppress or enhance (Anne, Ian, Harry, Marian). Examples in node. Students seem to find it easier to bring back longer term PK but find it difficult to make links with newer knowledge - perhaps it isn't yet consolidated. Emma talks about knowledge on course as PK rather than just longer term knowledge, suggesting that triggers will get easier (later triggers do include more discussion of clinical experience and anecdotal knowledge). Facilitators have to work at this. Students need to be encouraged to discuss the role of PK, the lack of expectation they have to get everything right and the need to share experiences and knowledge with one another. Need also to learn how to link new knowledge with previous learning.

Reflection - Look at this one again (see notes in pad)

Relying on others - this only has four references where students talk about this concept. No examples. This is where students talk about being able to say they don't understand something and be helped by the group to understand things - more about cognitive processes than sharing factual knowledge

Repeating/agreeing- two types of agreement, one is to say they agree or say yes etc the other is echoing of the other persons words. Joyce and Marian engage a lot in echoing. Jay engages a lot in saying he agrees and this is in a leadership manner, almost congratulatory/reflective. Not sure of value of this as there is nothing to compare with to say whether group agrees or less than normal. Marian does a lot of agreeing and this might account for her high number of utterances. She also waits for someone else to contradict then agrees with the contradiction before she is prepared to contradict herself. There is little learning value but more social value in this strategy. Perhaps compare this to disagreement/contradiction to see whether students find one easier than the other. Can be seen as supporting others but also interpreted as 'I know that too' - esp echoing where you are demonstrating you have the same words as someone else.

Right and wrong - this is an interesting issue as it demonstrates that the students are unable/unwilling to see learning as an exploration but rather that it is about getting things right, that there is a right answer and they must find it, and that the tutor holds the right answer and it is a game of trying to guess what the tutor has (esp re learning outcomes). It is therefore also linked to "tutor-centred". Strong evidence in non-verbals, looking at tutor for confirmation, tutor nodding emphatically if they have it 'right'.

The link with the project aim is less clear as this is more about students in general rather than WP students but could be linked to confidence. Students from WP backgrounds may lack confidence (see communication and confidence) to have a go and be prepared to 'get it wrong', examples in Marian, Ed and Laura who often mutter or modify their suggestions with 'that's what I think' etc. If this is the case then even more important to ensure these students understand the aim of the PBL discussion - to make suggestions and have a go. To share ideas and explore alternative perspectives, move away from a positivist paradigm which is not easy within science and HE assessment-driven policies. Some students are more acutely concerned with right and wrong. E.g. Joyce talks about rehearsing feedback, looks up what is in following week's trigger. Talks about not feeling stupid as nobody's a real expert, therefore element of competition too. This may be a facet of her character rather than her age (as her WP characteristic) as Anne is the opposite. Marian is also afraid to get it wrong. Jay identifies this issue in his interview by expressing frustration with brainstorming - everyone wants to get it perfect.

Self-directed learner - This needs to be linked with motivation, individual identities and external factors. There are intrinsic and extrinsic factors which impact on whether a student is self-directed in their learning but the outcome impacts on whether they engage at stage 6. Might change this node title to attributes required for effective stage 6?

Some students have lots of evidence of being self-directed - Ian, Emma, Joyce. Den and Laura have some evidence. Joyce appears to do most additional work (also noted by students) but does also seem to demonstrate that she is extrinsically motivated by this (e.g. competition and to impress?) as she admits to procrastinating, not doing work during holidays and she figures highly in competition node. Is this a problem? Harry admits to being extrinsically motivated by the PBL timetable of weekly triggers. Marian's ability to be self-directed affected by family commitments. Ed, Jay and Pam - nothing comes up but their feedback is weak so perhaps not motivated at all or external factors too great?? Self-directed learners seem to fair best which is not surprising but

nice to show this correlation. Laura and Den don't do well although they leave due to illness rather than failure.

Links with WP - external factors may have a bigger influence on student success as these stop students being self-directed which appears to result in failure. Intrinsic factors are non-specific to WP. Might suspect that graduate entrants would have more skills to be self-directed (Harry, Jay, Den, Ed) but these students do less well. Again - skills less important than external or internal factors.

Sharing - needs to be incorporated into students' perceptions of PBL although some of the comments are also about sharing that goes on in this particular group. They have been coded there too. Use this to support context-setting description of what the students think about PBL and the group. Not really WP issues here although sharing might conflict with notion of competition which is prevalent in some students possibly as a result of traditional education system and Joyce - American education where individualism is prioritised.

Skills for PBL - change this node to attributes? some are skills needed and some are skills promoted. Sometimes it is difficult to differentiate between these two as all skills should be developed and is it possible to identify the initial baseline level of a skill required?
Make Skills a grandparent node with skills needed to start and skills developed as parent nodes? Individual skills discussed and observed as issues are
Roles
Chairing - how to direct, bringing in other students, not putting them on the spot but being able to challenge each other, summarising, misunderstanding role thinking the chair needs to be the subject expert (have the knowledge)
Scribing, spelling, summarising, listening, legible writing (dyslexia issues)

Technical
Article searching, literature management (do they need this up front?), Powerpoint

Cognitive
Reflection and self awareness of own learning needs (Pam, blames others)
Ability to articulate needs into learning objectives which clarify breadth and depth, Motivation and self-directedness to carry these out (see motivation node)
Conceptual thinking, ability to summarise and link with previous knowledge (e.g. brainstorming stage and summary stage)

Critical appraisal of literature/information used (Harry MR knee, Den Dr Herbs, Joyce Head injury guidelines)

Communication:
Social - students suggest it promotes interpersonal skills - does it? Do students need these first? Especially as role of chair requires these (e.g to bring in a quieter student)
Face management - self and others
Managing groups, managing different types of people
Listening skills (not jumping in)
'Talking info from top of head' (Harry) - paraphrasing, ability to express complex concepts
Using technical radiographic/medical terminology accurately
Using educational language accurately (learning objectives)
Confidence to do these things (although not a skill and captured in sep node)
Presentation delivery
Teaching (eg Den brings back resources but puts the whole article on a powerpoint)

Socialisation - gives support to the claim that this is not a group which puts socialisation before the learning. There is also evidence that certain of them socialise more than others based on commonalities such as age, being mothers. Younger students socialise on facebook. Could add some evidence from the tea break talk to show that much talk during this time is also related to the programme. (see annotations for this work). This links to group communication strategy and reluctance to breach FTAs as the social distance is too great. Link to FTA

Student centred - not useful for study questions and only has two examples. Is more about PBL as a learning process rather than skills etc which are better discussed under self-directed learner so delete

Students perceptions of PBL (changed name from different way of learning). This shows what each student thinks PBL is and emphasises what is important for each student. e.g. discussion and sharing, searching, applying etc. Shows how each students is different too - e.g. Joyce traditionalist. This would be good for differences between students in an analysis of individuals (and group) and PBL processes. What do students think it is - can then follow up with what they think it is in second interviews (?separate study). Do students with an incorrect perception (lack of understanding of key elements such as self-directedness and

sharing) struggle more and if so is this 'attitude' something that needs addressing as part of preparation.

Them and us- this is about student seeing themselves as different to the tutors and different to the radiographers so the two elements are them and us in PBL and them and us in clinical placement. Subsume into students perceptions of PBL for first element. This can be used to explore what the students' expectations of the tutor are and the relationship between the tutor and the students (students refer to academic staff as they, them, she, he but as a collective rather than individuals). Some students acknowledge being different when the tutor isn't around and this is evident in videos although this may be more about being different when the PBL play isn't being performed as students make these admissions in front of the camera even thought they know it is still rolling therefore a tutor is still present in the form of the camera. Students ignore me when the PBL isn't running (but when I am in the room) but talk freely with me when the performance is on (links also to 'on-stage' node)

Despite the differences between the students solidarity as a group as different to the tutor is more pertinent. This links closely then with the tutor-centred node too as if students see the tutor as different and the tutor acts to take control of the learning, the students expectation of PBL and the tutors expectations of PBL are mismatched. Traditional relationship boundaries need to be broken down in the PBL curriculum otherwise it will be hard for the students to make the learning student centred and take control and ownership of, for example, learning outcomes. Becomes a guessing game of what the tutor wants.

Them and us re clinical is about students developing their identities as clinical practitioners. This happens at different rates for different students (depending on what? - look at in-group out-group theories and how people become 'in' quicker than others). What is the impact on the learning - PBL becomes learning for understanding practice rather than learning theory for the sake of it. May also limit open-mindedness to consider alternative practices (parochialism). Students are from mixed practices but if they are developing professional identities at different rates (and are struggling to voice opinions) these other practices may not be articulated.

Remember to link this back to diversity. This will be around student solidarity despite difference, differences in student ability to integrate in practice and become 'in' (mature vs young vs minority group etc) and previous experiences of education. Maybe also closeness in similarity between tutor and student (age, ethnicity, educational level)

Things in common - Den's quote about all being students therefore they have a lot in common. Other commonalities identified - more mature students. Not much identified as being in common even though they are asked. Combine with difference node and opinions of the group. Will help to support claim that they are a group with little in common, providing contextual information.

Transmission mode of learning - not really relevant to this study as it could be applied to groups of traditional learners also. It is more about facilitator skills than students skills.

For interaction tree nodes refine and add categories as required
change seeking clarification and questioning to questioning and quizzing

Stage 2
Refine and merge nodes as per notes above

Expand some nodes where there are sub-issues
- Opinions about the group changed to shared group identity (to reflect Spencer-Oatey's 'face' element of RM). Sub-sectioned into child nodes for descriptors used. Node itself is demoted into one called group. Also to include group communication (management of rapport), group similarities and differences. This node of 'group' will form the bulk of results for question 3.
- Moved most of others perspective into learning as a result of sharing as this was the emphasis students placed on the advantages of mixed group and PBL. Broken up to look at the sorts of things that are shared, e.g. knowledge, explanations, different perspectives, different ways of explaining, mutual agreement and confirmation
- External influencers in non-traditional students mode broken down into factors and moved to non-traditional students in groups, then retained in free node for future reference but do not need to do anything with this any more (? redundant)

Change names of nodes to better reflect developing theory
- Discourse of being a radiographer changed to Using new Discourses to be discussed within the communication for PBL section and some also in learning interactions observed section 5.
- Maintaining links after group changed to maintaining links outside the group to reflect developing socialisation at the time of the study too (to merge with socialisation?)

- Relying on others moved into learning interactions and re-coded 'learning as a result of shared interaction'. May need to move this into sharing within students perceptions of PBL though as these are probably the same. Within students perceptions of PBL it is about what they envisage PBL will be. Within learning as a result of shared interaction it should be what they have reported having engaged in PBL - check this distinction is clear. Also need some observation data to support this here. Look for the examples the students cite in their interviews if possible.
- Repeating/agreeing moved into learning interactions however this concept is also about social support. Need to identify the purpose of the agreement. This is a fairly unique communication strategy for group learning as individual learning does not have this social feature associated with it.
- Participation unacknowledged and misunderstandings merged into a node in q4 called pragmatic failure. These failures may be due to a number of different reasons and will need classifying when report the results

Formation of models related to questions (overarching project, and questions 2 and 4 complete)

Import project nodes into models for each question and decide on relevance for the question

Re-merge according to models and delete redundant nodes
- Personalising concepts moved to interactions and attending to own face as it appear to be a strategy to enhance or save face. Allows detailed feedback but without underpinning knowledge. May also be viewed as a process to reduce group social distance though
- Added age into differences between member in 'group' and also into non-traditional students
- Moved right and wrong into non-traditional students but need to move interactional issues and examples as a result of right and wrong into relevant learning interactions folder
- Roles for PBL moved into students perceptions of PBL. This needs to be broken down into specific roles. Need to also look at what is coded into parent node of students perceptions to make sure there are no duplications
- Using new discourses moved into interactions but will also need to include in Q1 requirements of PBL
- Communications skills - Moved in to roles for PBL and Managing roles depending on whether it was talked about or an illustration of how the communication skills affected roles - don't delete yet in case I decide to

keep this a separate node

- A number of individualistic attitude nodes merged into individual identities. These may or may not be related to WP but will be useful for reference to psychological and personality traits as an area not covered in the discussion section
- Moved FTAs into individual group roles where the FTA is experienced or observed. Need to go to social interactions tree node and do the same.
- 'On stage' moved to acting out performance in Q1 unique demands of PBL
- Them and us split into tutor centred within q2 student diversity characteristics to show which students look to tutor to guide the session. Some moved to Q1 where students are talking about PBL being about student rather than tutor centred.
- Confidence broken down into q1 re which roles the students say confidence is needed for. There may be examples of lack of confidence too so go back to this (still in free nodes) when looking at q4 and q5 for evidence.
- Transition mode and tutor centred moved to students extrinsic factors in 2b. Transition mode is where students state a preference or demonstrate a preference for this as a method. Tutor centred is where students defer to the tutor (e.g. looking at the tutor for confirmation or directly question them - look at relationships node to support this too) or where their actions are impacted by the tutor's presence or input. Some of this is observed so may be better discussed in 4 or 5.
- Using new discourses broken in to q1 and skills/attitude sections in q4 where there is evidence than a lack of skills or attitude in using discourses limits progress. Some also saved in managing FTA in 4 as evidence that each of the students approached this requirement with different levels of confidence. As a result some incorrect usage goes uncorrected or laymans terms are used instead of technical discourses, again without moderation by the others.
- Previous knowledge broken down to fit into questions 1 where it relates to what students bring as a result of being different to each other or as a result of them being a non-traditional student with previous study and experience. Also moved to management of FTAs and attitudes to look at how they manage their PK to benefit themselves or others. Also put into q5 where there is evidence of students bringing PK back to the discussion (examples so far seem to be stage 7 so look for some examples in stages 1-5 too - this now done for the 4 sessions where a detailed analysis has taken place)

Redundant

- Benefits of PBL related to work - deleted as not related to project focus

- Things in common and differences added to new parent of 'group'
- Disagreements captured in how students manage these and stored within learning interactions. Comments about whether the group disagrees captured in group identity
- Positive feedback deleted (not specific to project focus, only one entry)
- Resources as external influencer. There was only one ref to computers (Anne sharing with Kids) as young student may also have to share computers with other students. Not a strong argument

Decided on detailed analysis of triggers 2 (done), 4,5 and 9 adapted to consider high and low order goal achievements. Some of original categories combined. 2 chosen as feedback trigger one was about individual learning so not much construction to be had also 2 had Ed there too. 4 had everyone, 5 had me, and 9 was the final week with all stages. Chose a session rather than a trigger (i.e. feedback on previous week's trigger rather than the same trigger as the same people would be present for the whole session and could compare inputs across stages. Categories of learning interactions split into high and low order for ease of analysis but also combined some other categories and split others according to what the original coding showed.

Appendix 8: Maastricht 7-jump process model

Stage 1: Identify terms and concepts not understood (come up with a working definition)

(CLARIFY TERMS AND CONCEPTS WHICH ARE UNCLEAR OR WHICH YOU DO NOT UNDERSTAND: All in the group should understand and be in agreement about what terms and concepts in the case/situations mean and entail).

Stage 2: Identify the main problem or problems (what is the trigger trying to get you to learn)

(DEFINE THE PROBLEM/PARTIAL PROBLEM: What phenomena or facts need to be explained? Before the group continues, all in the group must be aware of what problems are to be dealt with.)

Stage 3: For each problem ask, "what do we currently know about the topics raised in this trigger?"

(ANALYSE THE PROBLEM
What explanations or ideas are there in the group regarding the problem? Begin to analyse a problem if you have defined several. Use about 5-10 minutes for "brainstorming" around the problem. Do not discuss or reject suggestions; just note down all the ideas.)

Stage 4: What questions remain?

(MAKE A SYSTEMATIC INVENTORY OF THE EXPLANATIONS THAT HAVE EMERGED IN STAGE 3.
Process the suggestions and explanations that have emerged. Try to look for connections, categorise, sort out what appears to be irrelevant).

Stage 5: Construct the learning outcomes

(FORMULATE TARGETS FOR THE LEARNING NEED. (LEARNING OBJECTIVES)
What is it that you do not understand and cannot explain? Are the solutions the group has come up with complete and correct? What is it that the group must gain more knowledge of? Formulate and set concrete targets for the learning need that appears in the analysis in Stage 4.)

Stage 6: Acquire knowledge in relation to the learning need
The group and/or each group member should make it clear for itself how they/it will effectively obtain the knowledge it needs. The group will obtain for itself individually or as a group the knowledge from the targets that have been formulated in Stage 5.

Stage 7: Synthesis and check newly acquired knowledge and information
The newly acquired information and knowledge should be scrutinised and described in relation to the problem. The new knowledge should elucidate the problem and answer the questions put by the group.

Appendix 9: Sample trigger (actual trigger 6 for this study group)
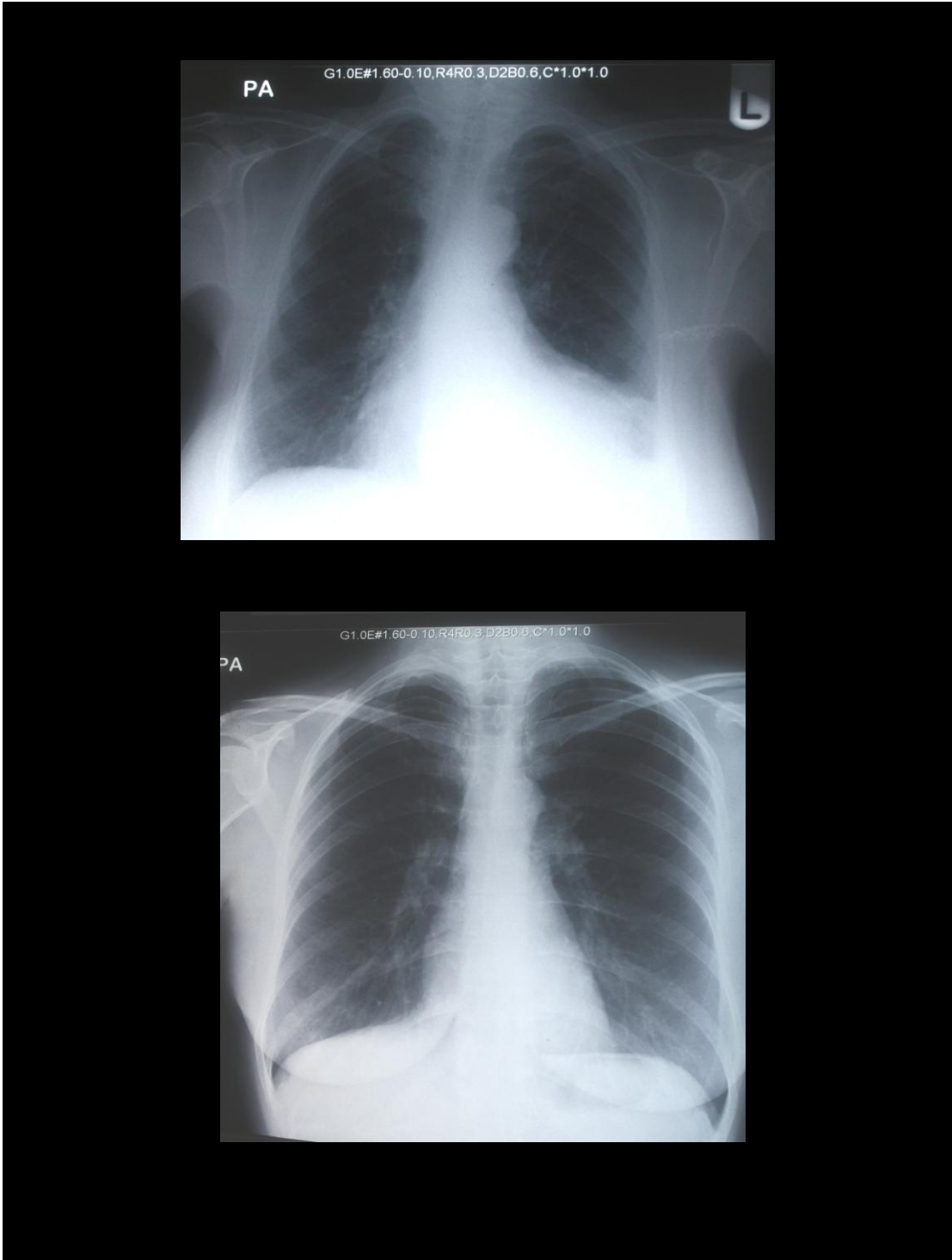
X-Ray Request Form   Manchester Acute Hospitals *NHS* Trust

NHS No.   124587

Surname: Smith

First name(s): Mary   **Middle initial:** B

Male/Female: Female   **Date of Birth:** 10.06.35

Address:
65, Carligoe Court
Upper Euxbury
Bury

Post Code: BU 7 9LD

All Points Hospital

Compass Road

Greater Manchester

M6 6PU

Referring Clinician Name:…………….……….………   **GP Name:** Dr Desai

Referring Clinician Addres:…………….……….………   **GP Address:** The Copse Clinic

…………….……….……….……….……….……….……….……..   Bury New Road, Greater Manchester

…………….……….……….……….……….……….…….

Do you wish us to book Transport ?   **NO**   YES   Sitting Car   Ambulance 1 / 2 Man
                                                     (please circle)

Ward patients only   **Walking**   Trolley   Chair

Could the patient be pregnant ?   **NO**   YES   *(please circle)*
LMP date:…….……….…

Previous Imaging ?   NO   **YES**   Year: 2002
Films enclosed ?   **NO**   YES

Is the patient an infection risk ?   **NO**   YES
            (e.g. MRSA)

Clinical history/indications for examination and clinical question to be answered:

Shortness of Breath, Raised BP

? Cardiomegaly

Referring Clinician *(Print)*
Dr N Desai

Referring Clinician *(Signature)*

Dr N Desai

Date: 13.11.07

Examination requested:

PA Chest

Operator's Signature:

…………….……….……….………..

Date:…………….…..

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