Students' Experience of Challenge, Difficulty and Stuckness in Higher Education: A Qualitative Longitudinal Study

Submitted by Rachel Canter to the University of Exeter as a thesis for the degree of Doctor of Education in Education
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Abstract

It is widely accepted that Higher Education should provide students with a challenging experience. Research on threshold concepts provides a framework for exploring challenging content within a discipline and has contributed to understanding how to support students with conceptual difficulties. However, less is known about how individual students experience challenge and difficulty in their academic studies, in particular how they respond and feel when they become stuck. This study explores students' experience of challenge, difficulty and stuckness, how they responded and managed challenges and any associated feelings.

The study, carried out in a university in the Southwest of England, used a Qualitative Longitudinal Research design to follow 16 students through the second year of a degree for Allied Health Professionals. Data were collected using the semi-structured and email interview methods. Data were analysed longitudinally and cross-sectionally using a constant comparison process. The findings and discussion are presented using a 'natural' style which aims to capture the student journey over the academic year.

The study found that some form of challenge, difficulty or stuckness was commonplace in the students' educational experience. The value of challenges which create uncertainty in education is recognised, particularly where students are grappling with boundaries around knowledge. Variation in students' experiences was partly explained by their 'spiky profiles' (influencing factors such as prior education and work experience) and partly by differences in factors relating to strategy use. The students were creative and resourceful in developing a range of specific and generic strategies in several areas: the use of time and space; the management of expectations and acceptance of feelings; and monitoring and reflection.

The study adds to current understanding of stuckness through an examination of the liminal spaces students encountered. The discussion argues for a more nuanced and holistic approach to understanding students' engagement with a

complex cycle of challenges and strategy use, which creates a range of expectations, tensions, feelings and opportunities. It identifies implications for Higher Education practice and calls for an understanding of the impact and interconnectedness of factors influencing students. It stresses the importance of providing structures for students to explore how they learn and develop their academic practice, in addition to discipline specific knowledge and skills.

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Contents

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List of Abbreviations

AHP	Allied Health Professionals
AHPC	Allied Health Professionals Course
ASA	Academic Skills Adviser
BTEC	Business and Technology Education Council
DoE	Director of Education
ETL	Enhancing Teaching-Learning Environments
FE	Further Education
HESA	Higher Education Statistics Agency
HoD	Head of Department
HoDis	Head of Discipline
HE	Higher Education
MRI	Magnetic Resonance Imaging
ME	Metacognitive Experiences
PAL	Peer Assisted Learning
PASS	Peer Assisted Study Sessions
PBL	Problem-Based Learning
PGCE	Postgraduate Certificate in Education
QLR	Qualitative Longitudinal Research
US	United States
WTP	Ways of Thinking and Practising

Chapter One: Introduction

> The “world” understood as a world of plurality and difference, is not only the *necessary* condition under which human beings can come into presence; it is at the very same time a *troubling* condition, one that makes education an inherently *difficult* process (Biesta 2006, p.9) [italics in original].

During the early part of my doctoral journey I started thinking about potential research topics. My reading, my professional practice and my background all influenced the final decision. Gert Biesta (2006, p.27)) raises several complex ideas in his book ‘Beyond Learning’, and what resonated with me was his response to the question ‘How difficult should education be?’ His view illustrated in the quote above, is that education is about students ‘coming into the world as unique, singular beings’ (p.27). He suggests that this process involves encountering ‘others’ and that these interactions may well be challenging and raise ‘difficult questions’ for an individual. (Biesta 2006, p.29). Others in the field of education, writing a century apart, emphasise the role challenge, difficulty and the process of not understanding or being stuck have in the learning process. Dewey (1910, p.120) states ‘our progress in genuine knowledge always consists *in part in the discovery of something not understood…’* [italics in original]. For Schwartzman (2010, p.38) ‘real learning requires stepping into the unknown, which initiates a rupture in knowing’. Meyer and Land (2006, p.xiv) suggest that:

> When knowledge ceases to be troublesome, when students sail through the years of a degree programme without encountering challenge or experiencing conceptual difficulty, then it is likely that something valuable will be lost.

I had grown up with the idea that education was challenging and that difficulties were part of learning. This view was partly shaped by some inspirational teachers during my secondary education at a state school. My mathematics and geography teachers, in particular, put challenges in front of me, but also created an environment where it was acceptable not to understand. There was no expectation that we would be able to do mathematical problems straightaway, taking time to understand and ask questions was seen as the norm. Although there was no mention of ‘academic skills’, their approach was one which

accepted that students needed guidance on *how* to study alongside the teaching of the subject matter. This encouraged me to reflect on how I study and learn.

Despite thoughts about becoming a teacher I was unsure about entering Higher Education (HE), as I was the first person in my family to do this. Although I graduated with a 2.1 in mathematics and economics, I found the lack of contact with teaching staff and the levels of engagement in lectures difficult. I worked hard to understand the subject matter and relied mainly on my peers for academic support. After a mixed educational experience at university, I taught mathematics in a London theatre school and volunteered twice a week at a young people's advice and counselling service. These experiences widened my understanding of how different teaching methods and support mechanisms can impact on individuals' experiences of challenges and difficulty in their lives. I therefore decided I wanted to work in education, so I returned to HE to do a PGCE in secondary mathematics.

I spent the early part of my working life in a variety of voluntary (third) sector organisations, mainly young people's advice and youth centres. Those who used the services were facing a spectrum of challenges: homelessness, financial difficulties and physical and mental health issues. I also spent periods of time teaching in formal educational settings, eight years in two Further Education Colleges and eleven years in two HE institutions. Working in different educational settings gave me experience of how personal, social and economic factors influenced students' access to education and their experiences of challenge and difficulty. As an educator this raised questions for me regarding how I could best support students with these challenges. As Meyer and Land (2006, p.xv) explain 'how might we help our students not to avoid troublesomeness, but to feel more confident coping with it…'

I therefore came to my current role as an Academic Skills Adviser (ASA), in a Russell Group university with three core beliefs underpinning how I work with students: (1) Education is and should be challenging; (2) Students are unique individuals coming to HE with a variety of backgrounds and experiences; and

(3) If students were to gain the most from their educational experience, then supporting them with challenges was an important part of my role.

As an ASA I provide guidance and support with academic skills development or learning development, including critical thinking, academic writing, exam preparation, presentation skills, and project and time management. Cottrell (2013b, p.1) argues that 'we now have much greater appreciation for the role of educational "inputs" on student performance and the effects of "nurture" on what students can achieve'. In my professional experience support with understanding how they learn and associated academic skills, in addition to developing discipline specific knowledge and skills, is often an accepted part of what students expect in HE.

Learning development in my institution has shifted the focus from work with individual students to sessions being offered as part of the curriculum. This change has partly been driven by increases in student numbers, but also by the belief on the part of the ASAs that academic skills development is valuable for all students. The preferred scenario for learning development is where all students 'would learn subject content and become extremely skilful in their academic practices simultaneously' (Verity and Trowler 2011, p.248). It could be argued that this change promotes the idea that studying is a challenging process and difficulties are not necessarily confined to particular groups of students. However, it can also lead to a situation where provision is reduced and less attention is paid to the varying needs, perceptions and experiences of individuals. Samuels (2013, p.16) calls for more research regarding the nature and effectiveness of learning development services. I therefore concluded that by exploring the challenges students were experiencing and how they were managing this, my research could add to the evidence base and therefore inform decisions about the support offered to students.

I currently work with students who are seen as high achievers, having gained a place at university with good entry grades. I expected them to be facing challenges as they entered HE. What troubled me was how hard they were on themselves about the fact that they were finding things challenging. I was aware that they viewed their challenges differently and that this was influenced by

factors such as their previous educational experiences. Many of the students I spoke to in individual appointments or workshops were anxious about the challenges they encountered and interpreted their difficulties as a problem with their own abilities. I often found myself reassuring them that getting stuck with challenging concepts, or with organising the structure of their essay was part of the learning process.

Although only a proportion of the student body vocalised their concerns, I was aware that academic and professional services colleagues were having similar conversations with students. They shared my view that challenges were part of the educational process and were working hard to support students with difficulties they encountered. I became more curious about what was influencing the different ways in which students' experienced challenges and became more concerned that this was affecting their enjoyment of their studies. Staff and student feedback from academic skills workshops suggested that creating spaces to discuss challenges and possible strategies helped manage the difficulties. I was also aware that spaces for this activity were diminishing within a busy curriculum.

My professional experience and that of my colleagues is an important part of informing any developments in practice. However, I wanted to understand more from the student viewpoint, about the types of challenges they were experiencing, how they were managing this and what feelings were associated with these experiences. Students who made contact with me for specific academic skills support had already identified a difficulty. I was therefore keen to research the students' experience of challenge and difficulty outside this context. My aim was to explore both challenges relating to the discipline context and those related to academic skills issues. This I hoped would result in the findings being useful to future students, my HE colleagues and inform my practice as an ASA. The research was therefore conducted with a group of 16 second year students on a three year degree course for Allied Health Professionals (AHPC). The methodology chapter provides more detail about the context and the student sample.

Thesis structure

This *introduction* has set the context for the research project, explained the rationale and how this connects to my personal beliefs and professional practice. The *literature review* examines key theories and research relating to challenge, difficulty and stuckness and provides further contextual information and a justification for the study. It also defines my research questions. Chapter three explains the *methodological considerations* in situating the research, the data collection, analysis and interpretation, concluding with a discussion on ethical and quality issues. *The findings and discussion extend over three chapters*. Chapter four *(findings part-one)* describes the key challenges the students experienced, explaining the influencing factors, associated feelings and specific strategies used. Chapter five *(findings part-two)* explores a wider set of generic strategies students used to manage their difficulties and stuckness. Chapter six discusses the main findings in detail, *drawing together the thesis conclusions.* It also identifies the implications for practice. The *final thoughts* in chapter seven identify areas for future research, the limitations of the study and I close the thesis with some reflections on my learning and the impact on my professional practice.

Chapter Two: Literature Review

Each section of this chapter integrates both theory and empirical research in order to explore current understanding of challenge, difficulty and stuckness. It first discusses *what might be meant* by challenge, difficulty and stuckness highlighting key theories and areas of research which have influenced the study. Section two focuses in more detail on *why* students might experience difficulties and examines potential influencing factors. The third section explores the *experience of being stuck* and discusses how students might respond and manage this process. Section four considers how *feelings* might influence a students' experience of challenge, difficulty and stuckness. The final section draws together these findings and identifies my research questions.

What is meant by challenge, difficulty and stuckness?

Feeling of difficulty

Psychologist Anastastia Efklides' (2006a) research into metacognition highlights links with both affect and the difficulty of understanding concepts. Although much of her research concerns difficulties school age children have with mathematical tasks, her findings are helpful in understanding students in other contexts. Through this psychological lens, a challenge could be described as a disruption in cognitive processing. An individual becomes consciously aware that something needs to happen in order for the task or action to be completed; the completion of the task has been interrupted in some way. One element of this subjective experience of an interruption in cognitive processing is a 'feeling of difficulty' (Efklides 2006a, p.51) Efklides (2006a, pp.51-53) defines 'feeling of difficulty' as one of a number of 'metacognitive experiences (ME)' or the feelings and judgements made by a person when completing a task. Others include 'feeling of familiarity', 'feeling of confidence' and 'feeling of satisfaction'. Efklides (2006a, p.48) also explains (Figure 1) how metacognitive experiences are the 'joint product of metacognition and affect', but distinguishes them from metacognition's other elements: metacognitive knowledge (an individual's theories and beliefs about their own and others' cognition) and metacognitive skills (the strategies used to control cognition).

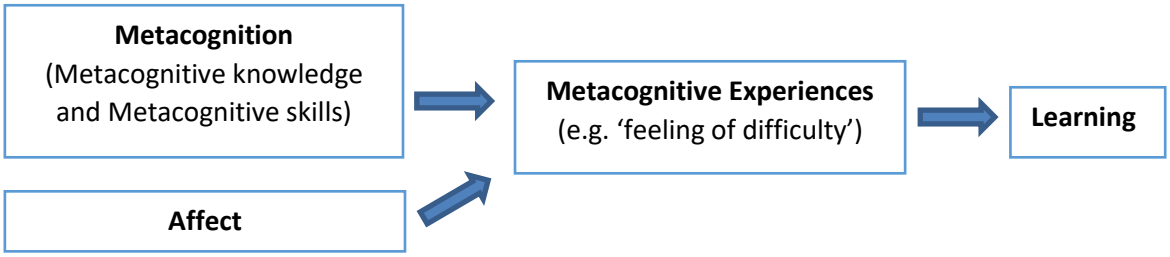

Figure 1: Relationship between metacognition, affect, metacognitive experiences and learning. Adapted from Efklides (2006a, p.49).

Efklides *et al.* (1998, p.208) explain that 'subjective difficulty' is much harder to measure than 'objective task difficulty' (the complexity of a task). In my study I am relying on 'perceived difficulty' i.e. how an individual might rate or describe the difficulty they are feeling (Efklides *et al.* 1998, p.209). Efklides *et al.* (1998, pp.209-212) cite a range of factors which influence these perceptions: cognitive ability, affect, personality factors, gender, level of expertise, task complexity and repeated experience with a task. Some of these factors are discussed further in the next section.

Threshold concepts

Research on 'threshold concepts' (Meyer and Land 2003) is an influential body of educational literature exploring challenge, difficulty and stuckness, primarily in an HE context. Beaty (2006, p.xi) claims that the threshold concepts approach offers a valuable way of addressing 'why certain students "get stuck" and find difficulty in negotiating particular conceptual transitions'. The approach was conceived as part of a project on Enhancing Teaching-Learning Environments in Undergraduate Courses (ETL Project Team 2001-2005). The notion 'threshold concept' (Meyer and Land 2003, p.1) was introduced as a way of defining concepts within disciplines which, when understood, would involve the individual in 'seeing things in a new way'.

> A threshold concept can be considered as akin to a portal, opening up a new and previously inaccessible way of thinking about something. It represents a transformed way of understanding, or interpreting, or viewing something without which the learner cannot progress, (Meyer and Land 2003, p.1).

These concepts were described as *transformative* (involving a change in a student's perception of a subject or sometimes in their personal identity); *irreversible* (in that the change is not forgotten); *integrative* (bringing a new awareness of the connections between elements); possibly *bounded* (where the threshold defines the potential boundaries of a 'conceptual space') and 'potentially (and possibly inherently) *troublesome',* (Meyer and Land 2003, pp.4-5). The authors suggest that these concepts may 'represent', or 'lead to', what Perkins (1999, p.8) describes as 'troublesome knowledge' or as they explain, knowledge that is 'counter-intuitive' or 'alien' (Meyer and Land 2003, p.2).

The empirical evidence for threshold concepts has now grown to include research in 259 disciplines in over 45 countries (Flanagan 2016; Land *et al.* 2016, p.xii). However, it is not without its critics. Schwartzman (2010, p.40) argues there is no agreement on an 'intellectually rigorous, definitive criteria for identifying threshold concepts'. O'Donnell (2009, p.9) claims this problem arises from the fact that threshold concepts are defined by two 'actual' criteria (bounded, troublesome) and three 'desirable' criteria (transformative, irreversible and integrative) and that the desirable attributes may or may not actually occur. It is therefore difficult to use them to identify threshold concepts in a discipline. Savin-Baden (2008a, p.131) warns that if used too prescriptively, 'embedding' threshold concepts in the curriculum could create a 'dominant narrative' and might suggest that students can only become members of a disciplinary community once they have understood these concepts. Although I share these concerns, threshold concepts do provide a framework for exploring challenging elements of content within a discipline and this research has therefore contributed to an understanding of how to support students with such difficulties. As Schwartzman (2010, p.23) points out, threshold concepts can be understood as 'an orientation towards supporting student learning of deeply challenging material'.

Theories of difficulty

In any attempt to define challenge, difficulty or stuckness one inevitably starts to discuss its potential causes. The threshold concepts framework suggests challenging content as a potential cause of difficulty. Perkins (2007, p.31) defines a 'strong theory of difficulty' as one which 'identifies learners'

characteristic trouble spots for a particular area of instruction and includes some causal analysis of why they occur toward improving teaching and learning'. He distinguishes between a theory of difficulty which 'defines the design challenge' and a complete theory of pedagogy which then tackles the challenge through the teaching-learning process (Perkins 2007, p.33). However, Perkins (2007, p.34) also points out that the two are linked in the sense that it may be hard to identify whether the difficulties students are facing are as a result of 'the knottiness of the content' or 'the naughtiness of slack instruction'.

Perkins (2007, pp.40-43) raises several points which are important for my research. Firstly, he suggests that several theories of difficulty may apply concurrently and urges teachers to focus on difficulties relating to content (which we might influence), rather than 'projecting the difficulty on the students or the conditions' (which may be outside our control). I agree that it is important to focus on conceptual difficulties relating to content and to identify the causes. One way to do this would be to separate these issues from those of student backgrounds or available resources. However, I believe that it is in the spaces where these factors interact that it becomes possible to understand the difficulties encountered and this is where I want to locate my research.

Perkin's (2007, pp.42-43) also warns against 'shallow' theories of difficulty which are 'overgeneral', or look at the topic and symptoms without locating the cause or where the solutions involve 'formulaic fixes'. One of the problems with the notion in terms of how it informs pedagogy is that a teacher needs a theory of difficulty which belongs to their own topic (Perkins 2007, p.42). Based on my own professional experience, I would add that a teacher also needs to have theories of difficulty which belong to their own students and context. Whilst I hope my research findings will be useful for practice, I am not aiming to produce an overarching theory of difficulty for the specific group of students or discipline. Rather I suggest that students have their own unique experience of difficulty, so it could be helpful for them to arrive at their own theories of difficulty. This point influenced my research approach and I hope the findings chapters shed light on the factors influencing individual students.

Finally, Perkins (2007, p.44) suggests that '…the trouble with pretty good pedagogy is that it is never quite good enough. It always leaves a residue of persistent trouble spots: conflations, omissions, overgeneralisations, failures of transfer and so on'. This statement appears to assume that the removal of trouble spots by teachers and/or students is always desirable. This view ignores the fact that trouble spots might be part of the learning process and that part of the teacher's role is to support students through the process of being troubled. I am not suggesting that we should abandon the search for ways to make the learning process clearer, or not take responsibility for our contribution to its complexity, but simply that as others have argued (Biesta 2006; Meyer and Land 2006), encountering difficulty is part of that process.

Disjunction and liminal space

Although theories of difficulty and the identification of threshold concepts give useful ideas for why students might find things hard and offer potential ways for addressing the difficulties, they do not necessarily explain the process of being stuck. Savin-Baden (2006, p.162) introduces the term 'disjunction' which she describes as like 'hitting a brick wall in learning' or the experience of being stuck. It can be seen as a form of troublesome knowledge, or a 'space or position reached through the realisation that knowledge is troublesome', a 'troublesome learning space' (p.163). She identifies different forms of disjunction, two which are seen as moments and two as cyclical processes (Savin-Baden 2007, p.11):

- *'A moment of aporia[1]':* when someone else draws attention to a concept which the individual thought they understood, but now they feel confused and stuck.
- *'A moment of conceptual puzzlement'*: the individual realises that they are stuck and are not sure how to move on. They may feel 'paralyzed or fragmented'.

[1] A greek term denoting a 'puzzle' or 'impasse' (Savin-Baden 2007, p.11).

- *'A cycle of stuckness':* The individual may know that they need to move out of the stuck place, but do not know how and keep repeating the same actions and repeatedly return to the feeling of being stuck.

- *'A hermeneutic cycle':* The individual reflects on the issues leading to the feelings of stuckness and reinterprets them. They are now viewing something which seemed familiar and whole, as fragmented with potentially unfamiliar elements.

Within the threshold concepts framework Meyer and Land (2003, p.10) explore stuckness by suggesting that when an individual is struggling to understand a threshold concept they may be left in a 'state of liminality… a suspended state in which understanding approximates to a kind of mimicry or lack of authenticity'. The notion of liminality can be traced back to the ethnographic studies of van Gennep (1960) and work by the anthropologist Turner (1969). In his exploration of 'rites of passage' van Gennep (1960, p.11) defined three stages: 'separation' ('preliminal rites'), 'transition' ('liminal rites') and 'incorporation' ('postliminal rites'). Turner (1969, p.81) explored the liminal stage further, describing 'liminal *personae* (threshold people)' as being 'neither here nor there…betwixt and between'. Meyer and Land (2005, pp.375-376) suggest that in 'liminal spaces' students are in a transition which can be transformational, with them gaining new knowledge, understanding and changes to their identity. However, this process can take time and be problematic, characterised by an 'oscillation between states often with temporary regression to earlier status'. Meyer and Land (2005, p.377) also note that 'mimicry' involves more than just 'surface approaches to learning', with students trying to understand concepts, as well as experiencing partial understanding or 'troubled misunderstanding'.

Savin-Baden (2006, p.163) argues that disjunction can be seen as a bridge between Meyer and Land's process of students encountering troublesome knowledge or a threshold concept and entering liminal space. She makes a distinction between the experience of being stuck (disjunction) and being in liminal space which involves the 'oscillation between states' and potentially elements of 'personal transformation' (Savin-Baden 2007, p.10). Savin-Baden's

forms of disjunction are useful in describing the experiences of individuals, although it may be difficult to distinguish between her two cyclical processes and the experience of being in liminal space. Both Savin-Baden and Meyer and Land recognise that the experience of being stuck and entering liminal space is not a linear process. Meyer *et al*. (2010, pp.xi-xii) have described the learning of threshold concepts as a 'journey through preliminal, liminal and postliminal states' with a 'degree of recursiveness, and of oscillation' (Meyer and Land 2005, p.376; Meyer *et al*. 2010, p.xi). Savin-Baden (2007, p.9; 2008a, p.104) argues for 'a model of transitional learning spaces' (Figure 2) which recognises the 'cyclical nature of learning'.

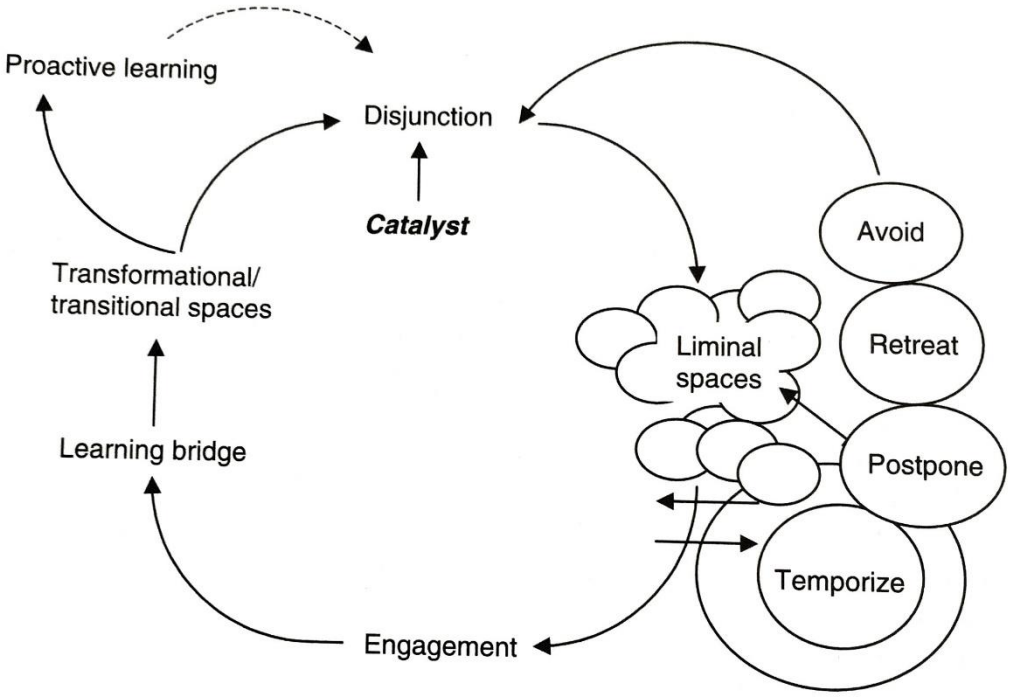

Figure 2: A model of transitional learning spaces (Savin-Baden 2007, p.9; 2008a, p.104).
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My research considers several issues highlighted by Savin-Baden's model. Firstly, she recognises that disjunction is 'multifaceted', difficult to understand and does not occur as a result of a simple 'cause and effect relationship' (Savin-Baden 2006, p.163). Secondly, the model acknowledges that different forms of

disjunction may lead to different forms of liminal space (Savin-Baden 2008a, p.103) and introduces ways in which individuals might respond or move through these spaces. Lastly, Savin-Badin (2008a, p.103) argues that any model of transitional learning spaces will be influenced by the individual learner, so exploring the individual student experience is important.

Factors influencing the feeling of difficulty and disjunction within the learning context

The previous section highlighted the fact that identifying the cause of a student's difficulty can be a complex process and is influenced by a range of factors. This section explores some of these factors in more detail. Savin-Baden (2008a, pp.95-103) identifies 'catalysts', which result in students encountering disjunction or becoming stuck and possibly entering liminal space. Efklides (2006a, pp.52-57) also identifies factors which influence metacognitive experiences and therefore 'feeling of difficulty' (summarised in Table 1).

Table 1: (A) Savin-Baden's (2008a) catalysts for disjunction and (B) Efklides' (2006a) factors influencing metacognitive experiences and 'feeling of difficulty'.

(A)	(B)
1. Modes of knowledge 2. Perceptions of difficulty 3. Disciplinary difficulty (including signature pedagogies) 4. New learning difficulties 5. Prior learning difficulties 6. Threats to learner identity 7. Threshold concepts 8. Scaffolding learning 9. Troublesome power 10. Learning stances 11. Challenging dominant narratives	1. Task difficulty 2. Instructional mode 3. Task context 4. Affective context 5. Person characteristics 6. Self-concept 7. Metacognitive person knowledge

Efklides' (2006a, pp.55-56) factors tend to focus on what is happening in relation to a particular task and how that might be influenced by, and impact upon issues of learning and teaching. She highlights the importance of the affective context which, she suggests, interacts with factors related to the task and the individual student. Savin-Baden also discusses factors affecting individual students' learning and the teaching context. For example through perceptions of difficulty, learning stances, prior and new learning difficulties, threshold concepts and scaffolding learning. However, Savin-Baden takes a wider perspective on disjunction and the process of transition, discussing issues such as modes of knowledge, disciplinary difficulties, troublesome power, challenging dominant narratives and threats to identity.

Rather than examining these factors separately I have combined them into a single discussion, incorporating elements from other theories and empirical research. I begin with *task related factors* (task difficulty, presentation and organisation), move on to *individual learner issues* (self-concept, identity, power and personal voice, epistemological beliefs) and finally explore the *discipline being studied* (bodies of knowledge, disciplinary lenses and their interaction with learning processes).

Task difficulty

If an individual experiences an interruption to their cognitive processing during a task, the lack of processing fluency triggers a feeling of difficulty. They may not be able to identify the source of the feeling, but the search leads them to make attributions (Efklides 2008, p.282). Feeling of difficulty often triggers attributions of task difficulty (Metallidou and Efklides, 2001; cited in Efklides 2008, p.282). Tasks might be perceived as difficult because of their complexity (defined by the number of steps / operations), their conceptual demands, or the way in which the task is presented (the task context) (Efklides 2006a, pp.52-57). Objectively difficult tasks (as measured by mean performance) give rise to greater feelings of difficulty (Efklides *et al.* 1997; 1998). However, Efklides (2006a, p.54) explains that this judgement generally changes with progression through a task. The feeling of difficulty is updated based on information about the task features, prior task knowledge and elements relating to the task processing (i.e. whether

this is fluent or interrupted). She also points out that some students may not update these feelings, particularly where they are relying on others to guide them on how to complete the task (Efklides *et al.* 1999, p.471).

However, it is important to note that judgements about levels of feeling of difficulty do not necessarily correlate with performance (Efklides 2006a, p.57). In the case of familiar or easy tasks, processing is automatic, so the cause of the feeling of difficulty is unclear and might be related to factors such as the presentation of the task, which may have no effect on performance (Efklides 2006a, p.57). With difficult tasks there can be a number of scenarios. The student might have a high feeling of difficulty, experience negative affect and abandon the task. They might however, have some sense of what is causing the difficulty and act on this, which could lead to a successful or unsuccessful performance. Alternatively a student might experience a low feeling of difficulty because the task seems familiar or they underestimate its demands, they then do not invest the required effort and this results in a poor performance (Efklides 2006b, p.10). What is interesting here is what actions students take as a result of these feelings. Efklides (2006b, p.11) suggests it is helpful if an individual can 'learn the meaning of his/her ME [metacognitive experiences] and the conditions that give rise to them if s/he is to be in charge of his/her cognition'.

The objective difficulty of a task clearly has an impact on students' feeling of difficulty, however, as Efklides (2006a, p.64) points out the evidence for the accuracy of this monitoring and the impact on performance or learning is mixed. Efklides (2006b, p.11) suggests that the accuracy of an individual's judgement about a task is adjusted (or calibrated) when they gain more experience with the task or the domain. She adds that feeling of difficulty and other metacognitive experiences can also be influenced by personality and social factors such as 'extrinsic feedback' or 'collaborative interaction', which affect the calibration process. My study explores what factors influence a student's experience of difficulty and therefore addresses Efklides (2006b, p.11) call for more research on what affects this calibration process.

Task presentation and organisation

There are several ways in which the presentation and organisation of tasks can influence a student's experience of challenge or difficulty. Firstly, Efklides (2006a, p.54) discusses this interaction in relation to Sweller's (1988) cognitive load theory. This states that tasks have an intrinsic load (their conceptual difficulty or complexity). However, if the way in which the task is presented is also perceived as complex by the students, the extraneous load is also high which increases the feeling of difficulty. For mathematical tasks, worked out examples (which influenced extrinsic load), helped students understand the task processing demands (the intrinsic load) and improved performance (Efklides *et al.* 2006; cited in Efklides 2006a, p.55). The type of worked out example used was important in terms of how much difficulty and effort expenditure students reported: those which presented heuristic schema (overall strategies or guidelines for solving problems) reduced the difficulty experienced and improved performance, compared to those which suggested explicit sub-goals which needed to be achieved (Efklides 2006a, p.55).

Another factor is how a task is initially described by the teacher. Efklides and Aretouli (2003; cited in Efklides 2006a, p.55) found students responded differently to a mathematical task depending on whether it was introduced as interesting or as difficult. Girls reported lower feelings of difficulty and a higher feeling of confidence and satisfaction when the 'interestingness' was stressed rather than 'difficulty', with the opposite result for boys. However, there were no differences in the case of drawing tasks. This suggests that there may be gender issues in the learning of mathematics which may not translate into other contexts.

The task sequence can also affect feeling of difficulty (Efklides *et al.* 1997; 1998). This relates to the notion of scaffolding learning, which Savin-Baden (2008a, p.101) suggests is a main focus for learning and teaching in HE. The term 'scaffolding' emerged from work by Bruner (1978) and Vygotsky's Zone of Proximal Development (1978). Scaffolding aims to move students from their current level of development to the learning of progressively more difficult tasks or concepts with the structured support of a teacher or peers. Savin-Baden

(2008a, p.102) suggests that ‘staff’s need to scaffold learning is troublesome’, since the teacher may impose their ‘pedagogic signature’ on the students rather than allowing them to create their own. This might ‘lead students around disjunction and into liminality’ (p.102). I do not think that Savin-Baden is suggesting that scaffolding is a redundant strategy, rather that teachers (and in fact students) need to be aware of the impact of how learning is structured and presented.

The order in which potentially challenging tasks are introduced to students and the difficulties this can create is well illustrated by the Problem-Based Learning (PBL) approach. Savin-Baden (2006, p.161) defines PBL as an approach focused on ‘learning around problem scenarios rather than discrete subjects’. She argues that because students involved in PBL are asked to ‘critique and contest knowledge early on in the curriculum’ they may experience knowledge as troublesome before students involved in other learning contexts (Savin-Baden 2006, p.163). As an ASA I have found that students across disciplines find the process of ‘being critical’ difficult, but this is not unique to the PBL context. Several assessments ask students to critique research papers and other literature in year one. Some students understand the ideas or theories, but are not sure how to critique them, or lack personal confidence when making independent judgements. Others say they do not feel they know enough about the subject matter to confidently critique the material. My research investigates whether students were experiencing difficulties connected to the task organisation and assessment, or with learning processes such as being critical.

Savin- Baden (2008a, p.99) suggests that for many students their experience of learning is of a more traditional and didactic form and that engaging with more active forms of learning such as PBL could therefore prove challenging. Although the interactive and independent nature of PBL can place some students in an uncertain place, my professional experience suggests that other students have been involved in education and work-related activities where they were encouraged to participate, ask questions and make their own judgements. For some of these students it may be other elements of the learning environment which creates difficulties, such as feeling inhibited by large lecture theatre experiences, or lower levels of contact with staff.

Individual learner issues

Self-concept

Efklides (2006a, p.57) defines 'self-concept' as made up of 'self-perception' (a person's beliefs about themselves), 'self-esteem' (the degree to which a person values themselves), 'self-efficacy' (a person's sense of their ability and capacity to deal with issues) and 'others' perception of one's ability'. She adds that self-perception in particular has an effect on feeling of difficulty. As mentioned, when students experience difficulty they may attribute this to the fact that the task is difficult (Metallidou and Efklides 2001; cited in Efklides 2008, p.282). However, because self-concept of ability affects feeling of difficulty, a student might attribute the feeling to their lack of ability and abandon the task (Efklides 2008, p.282). In this situation the feeling of difficulty is contributing to the student's self-awareness at the task or situational level, but may also influence the student's interaction with similar tasks in the future (Efklides 2008, p.282).

Efklides and Vlachopoulos (2012) study investigated the relationships between metacognitive knowledge in mathematics, mathematical ability and self-concept in mathematics. They analysed questionnaires, ability tests and mathematical tasks undertaken with 311 school students and 214 university students. They found that when completing mathematical tasks, university students relied more on their self-concept in mathematics (i.e. their belief about their general ability in mathematics) when making judgements about difficulty. In comparison, school students relied more on their metacognitive knowledge in mathematical task processing (based on easiness/fluency versus difficulty/ lack of fluency). They suggest that with age and growing experience, metacognitive knowledge becomes part of self-concept (Efklides and Vlachopoulos 2012, p.236). However, they also observe that university students who are studying non-mathematical subjects have no opportunity to update their metacognitive knowledge and their self-concept in this domain. They are therefore more likely to rely on beliefs about previous difficulties to assess their current feeling of difficulty (p.236). However, Efklides and Vlachopoulos (2012, p.236) point out that the mathematical tasks they used were quite difficult for university students and had they been closer to their ability level and prior experiences, the

influence of metacognitive knowledge might have been different. Feeling of difficulty and metacognitive experiences in general, and their relationship with self-concept and causal attribution is clearly important. What might start out as a task-specific difficulty can become a bigger issue and have a long-term impact on motivation to learn (Efklides 2006a, p.65).

Identity, power and personal voice

Learning is often described as 'identity work' (Cousin 2006, p.264; Davies 2006, p.71; Savin-Baden 2008a, p.16), since it results in a change in the individual. The nature of that change and how it might be experienced and recognised by the individual will vary greatly. An individual may experience difficulty or disjunction because a challenge has arisen which raises identity issues. Savin-Baden (2008a, pp.16-17) advocates a model of 'learning stances' to understand this complex experience, rather than learning styles and deep/surface approaches which she suggests can oversimplify individual approaches. She describes three stances: *personal* (how individuals create their own meaning in a learning context); *pedagogical* (how individuals 'see themselves as learners in particular educational environments'); and *interactional* (how individuals work with and 'construct meaning' in relation to others). These stances can overlap, there is constant movement between them, and they are often 'sites of struggle' (Savin-Baden 2008a, p.17). This struggle might be with concepts, ideas, others' approaches and expectations, and how one makes sense of this in relation to our own understanding, beliefs and ways of operating. Baxter Magolda (2009, p.143) describes this as a journey towards 'self-authorship' or the 'capacity to internally define one's beliefs, identity and social relations'.

Taking a critical approach is a good example of a 'site of struggle' where students may grapple with self-authorship and ways of understanding and expressing their voice. Kant (1992 [1784], p.90) talks about 'tutelage' or immaturity as 'self-incurred' when 'its cause lies not in lack of reason but in lack of resolution and courage to use it without direction from another'. My experience of working with students suggests that being courageous can also be influenced by an individual's beliefs and previous experience, as well as by the context; a student may have a viewpoint, but not feel able to express it. Carr

and Kemmis (1986, p.183) suggest a range of objective constraints (aspects of social situations outside the power of the individual) and subjective constraints (personal perceptions and understandings) which influence or limit how people act. It is therefore important to examine the ways in which these objective and subjective constraints might impact on a student's experience of difficulty and how these experiences influence a student's learning stance or identity as a learner.

Epistemological beliefs

Epistemological beliefs (beliefs about knowledge) are another potential factor influencing an individual's experience of challenge, difficulty and stuckness. For the past two decades educational psychologists have been interested in beliefs about 'knowledge and knowing…because of their recognized importance in the learning process' (Hofer and Sinatra 2010, p.113). Bromme *et al.* (2010, p.11) discuss their series of empirical studies with university students in Germany, examining the impact of epistemological beliefs on metacognition. They build on Winne and Hadwin's (1998, pp.279-285) COPES-model[2] of study tasks, using this to describe how epistemological beliefs modify students' 'internal standards, which in turn influence metacognitive monitoring and control processes'. Bromme *et al.* (2010, p.12) also argue that an individual's epistemological beliefs impact on their learning by affecting how students apprehend the content of a task, or acting as 'a lens for a learner's views on what is to be learnt' (p.8). Their discussion describes and extends two complementary approaches within the COPES model:

- *The consistency hypothesis* (Muis and Franco 2010) claims that students learn more when their 'epistemological beliefs fit with the structure of the knowledge to be learnt' (Bromme *et al*. 2010, p.13).

[2] COPES model (Conditions, Operations, Products, Evaluations and Standards)- 4 stages:
Stage (1) Task definition
Stage (2) Goals and plan
Stage (3) The enactment stage where the plan is carried out
Stage (4) Adaptation stage - strategies adjusted and long-term changes made based on the study experience.
(Winne and Hadwin 1998; Bromme *et al.* 2010, p.11).

- *The calibration approach* assumes that epistemological beliefs influence 'processes of metacognitive calibration' (Bromme *et al*. 2010, pp.13-15). A student could be described as 'well-calibrated' in relation to task complexity if they employ an appropriate strategy for the task.

Bromme *et al.* (2010, pp.8-9) explain that a key theoretical assumption about epistemological beliefs, is that as an individual's education progresses they move from 'naïve' to 'sophisticated' beliefs. Sitting at two ends of a spectrum: 'naïve' beliefs see knowledge as certain and as an agreed set of facts; 'sophisticated' beliefs see knowledge as complex, contextual and uncertain (Bromme *et al*. 2010, pp.8-9). Students with 'sophisticated' epistemological beliefs understand better what content to learn and apply more appropriate 'goal setting and metacognitive monitoring' (Bromme *et al*. 2010, p.15). Mason and Bromme (2010, p.2) in a review of research into epistemological beliefs and metacognition, add that in many studies more sophisticated epistemological beliefs are associated with better academic performances.

However, the relationship between having more sophisticated beliefs and performance is not simple. Although students might perceive tasks through their 'lens of epistemological beliefs' other contextual factors may affect whether they act on these perceptions (Bromme *et al.* 2010, p.22). They add that due to lack of motivation, students might decide not to elaborate more deeply, so although they could act in a sophisticated manner, they might act in a naïve one. Epistemological beliefs may have more impact at the planning stage of tasks, as their influence in the latter stages was only evident if students were prompted to reflect on the task and processes (p.22).

The relationship between levels of knowledge and beliefs is also complex, with more knowledge not necessarily leading to more sophisticated beliefs (Mason and Bromme 2010, p.2). Hofer and Sinatra (2010, p.118) also conclude from their research review that although sophisticated beliefs might be attributed to 'experts' in a subject, studies suggest that domain experts are 'least likely to be metacognitively aware of knowledge judgements, since they make them automatically and routinely'.

My experience with HE students, is that while they might hold particular beliefs about the nature of knowledge, for example about the value of different types of evidence; they have often not discussed this, or analysed how these beliefs might affect their learning. For some, awareness is raised when there is a conflict between their beliefs and what is being presented to them in their course material. Hofer and Sinatra (2010, p.119) claim they are concerned with 'dispositional views and the idea of "consistency" or "fit" between one's beliefs and a discipline'. They argue that learners benefit from understanding how different subtopics within disciplines involve underlying epistemological assumptions and that 'rich, flexible and generative beliefs' allow learners to adapt to new learning contexts (Hofer and Sinatra 2010, p.119). In conclusion, Mason and Bromme (2010, p.2) claim that the relationship between epistemological beliefs and learning remains unclear. My research contributes to this debate by exploring whether epistemological beliefs are an influencing factor in students' experience of challenge, difficulty and stuckness.

The discipline studied

The discipline HE students study is an important contextual feature in understanding influences on their difficulties. Kreber (2009, p.11) suggests a 'subject' consists of two elements, a 'body of knowledge' which 'we look at' and 'a disciplinary lens' that 'we look with and through'. I use the terms subject and discipline to mean both these elements and for consistency I will use the term 'discipline'.

The nature of a body of knowledge

Perkin's (1999, pp.8-10) explains why knowledge can be troublesome. Knowledge can be 'inert' or lying dormant and students do not necessarily use it or connect it to other ideas and examples. Knowledge can have a 'ritual' quality in that it is often used, but is not particularly meaningful to a student. 'Conceptually difficult knowledge' can leave students with a mix of misunderstandings where they have learnt some elements in a ritualised way, but their understanding of the concepts is exposed when faced with problem solving in new contexts. Finally knowledge can be 'foreign' to a student when it conflicts with their own views and values.

Discussing various ‘modes of knowledge’, Savin-Baden (2008a, pp.96-98; 2008b, pp.77-79) explores how knowledge can be a catalyst for disjunction. She cites Gibbons *et al*.’s (1994) description of Mode 1 propositional knowledge, which is produced separately from its use in the traditional ‘academy’, and Mode 2, which is ‘produced in and validated through, the world of work’ and may not relate to a specific discipline (Savin-Baden 2008b, p.78). She also refers to Ryle’s (1949, pp.27-32) earlier description of the terms ‘knowing that’ and ‘knowing how’. However, Savin-Baden suggests that these notions while useful, do not appreciate the ‘boundary spaces between the two forms of knowledge’ (Savin-Baden 2008b, p.78). She explains that Mode 3 knowledge (Barnett 2004, p.251) recognises that knowledge is about seeing and creating these ‘epistemological gaps’.

It can be helpful in many tasks to consider what a student needs to know and be able to do, but this often hides the complex interaction between ‘knowing’ and ‘doing’, particularly in ‘practical’ tasks such as conducting an experiment or teaching peers. In these situations students are involved in ‘doing-action’ or ‘praxis’ (Carr and Kemmis 1986, p.83), defined as ‘informed action which, by reflection on its character and consequences, reflexively changes the knowledge base which informs it’. Whilst the notion of praxis can apply to any discipline, I often observe students grappling with this complex interaction in subjects such as education, drama, medicine, law, psychological therapies and courses for Allied Health Professionals (AHP), where their assessment tasks require them to integrate theory and practice. This relates to Meyer and Land’s (2003, p.7) ‘tacit knowledge’, or

> ‘that which remains mainly personal and implicit (Polanyi, 1958) at a level of “practical consciousness” (Giddens, 1984), though its emergent but unexamined understandings are often shared within a specific community of practice (Wenger, 1998)’.

Savin Baden (2008b, p.78) claims that arguments about knowledge often overlook how the ‘spaces between these forms of knowledge are managed’ and how students and staff might connect them, an area my research explores. She suggests ‘Disregarded knowledge’ (Mode 4), might form a connecting bridge since it recognises these uncertain and fluid spaces and the existence of

hierarchies of knowledge. However, its value is often not made explicit in academic life (Savin-Baden 2008b, p.79). One form of disregarded knowledge is associated with emotional intelligence, for example knowing when to speak and when to remain silent.

Savin-Baden's (2008b, p.79) final Mode 5 knowledge is a position where an individual can work with all the modes of knowledge in a 'complex and dynamic way' and where one is 'treasuring stuckness and sitting with chaos'. Although she explains that this is not a final resting place but one with 'liminal quality', it does feel like the top of the knowledge hierarchy.

The disciplinary lens

Kreber (2009, p.11) defines the disciplinary lens as 'a set of conceptual and methodological tools employed in creating and critiquing this knowledge'. Perkins (2006, p.42) refers to the disciplinary lens when he discusses 'epistemes', defined as a 'system of ideas or way of understanding that allows us to establish knowledge'. Examples include how enquiries are conducted, what constitutes evidence, ways of constructing arguments, and the terminology and language used. Disciplinary lenses or 'ways of thinking and practising (WTP)' have also been used to compare disciplines (Entwistle 2005; McCune and Hounsell 2005).

The extent to which the epistemological structures of a discipline influence teaching and learning is important. Trowler (2009, p.184) suggests that although links are often made with teaching methods, theories of teaching and learning, and interactions with students and the place of student opinion, the links are not clear or reliable. These unclear boundaries around the disciplinary lens could create two problems. Students may have difficulties understanding what the lens consists of and they may find that elements of the lens challenge their existing values and beliefs.

Interactions between the body of knowledge, the disciplinary lens and learning processes

Threshold concepts research explores the relationships between a body of knowledge, the disciplinary lens and connections with 'learning processes'. One development has been to widen the notion of a 'concept'. For example, 'procedural threshold concepts' such as 'variation', 'randomness' and 'probability' have been identified in Biology (Ross *et al.* 2010; Taylor 2008), or 'equilibrium' in Economics (Davies and Mangan 2010). If a threshold concept is likened to a portal, then procedural concepts provide 'the guidance that directs the way in which the pieces are put together', allowing students to organise the structure of their thinking (Davies and Mangan 2010, p.195). Ross *et al. (*2010, p.174) argue that more work is needed to develop students' understanding of these complex processes, so they can cross conceptual thresholds and use these thinking processes when faced with new troublesome knowledge.

The above examples of complex processes have been identified within specific disciplines, but 'procedural threshold concepts' can be applied across disciplinary boundaries. In doctoral studies the notion of 'conceptual frameworks' (Trafford 2008), 'voice' (Guerin and Green 2012) and other concepts such as 'argument' and 'knowledge creation' (Kiley and Wisker 2010) have been identified as threshold concepts for 'doctorateness'. These examples suggest that there may be complex processes or ways of thinking which are discipline specific, and other 'learning processes' which operate in many learning contexts.

My work as an ASA supports students with difficulties they encounter with complex 'learning processes', such as structuring an essay argument or adopting a critical approach. Edwards (2011, p.4) argues that in the context of learning development, students are encountering 'troublesome processes, rather than troublesome knowledge'. She argues that whilst a student might find it difficult to fully understand a specific disciplinary threshold concept, the common challenge for learning thresholds is less to do with understanding and more to do with applying them in the context of the student's own learning. Part of the difficulty may be because the practical application involves changes to

‘ingrained existing academic practice’ (Edwards 2011, p.7). I find that students do need support to understand what a critical approach might mean, but the challenge of putting it into practice is more often the issue. Here, the context is important and the disciplinary lens comes into focus, since separating learning processes and difficulties with them from the discipline is problematic. My research examines whether the relationship between ‘generic learning processes’ and the body of knowledge or disciplinary lens might impact on students’ experience of challenge, difficulty and stuckness.

Experiencing disjunction and entering liminal space

The discussion in the previous section suggests reasons *why* students might experience difficulty and disjunction. However, there are questions to be asked about what occurs, and the ‘kinds of identities that emerge’ in liminal spaces (Savin-Baden 2008b, p.82). Land *et al.* (2014a, p.1) characterise liminal space as ‘difficult to get at’, using Ayer’s (1956, p.54) term ‘incorrigible’. They also suggest that spatial metaphors are often used to describe liminal space, but question whether it can be viewed as a space, a period of time, or a relationship with someone. Schwartzman (2010, p.22) adds that ‘scholarship on liminality…has taken the form of description, metaphor, and analogy’, arguing that there are gaps, or ‘lacunae’ in understanding a student’s experience of liminal space. It has mostly been ‘defined by its consequences’ such as the anxiety students feel or that it will be transformational (Schwartzman 2010, p.26). This section therefore uses theoretical discussions and empirical research to explore the experience of being in liminal space, how students might respond to the experiences and how they might manage the processes.

What do we know about being in liminal space?

An open or bounded space?

Savin-Baden (2008a, pp.13-15) uses Deleuze and Guattari’s (1987) concept of ‘smooth’ and ‘striated’ spaces as a way to think about learning spaces. Striated spaces have ‘a strong sense of organisation and boundedness’ with clear points which ‘one is expected to reach’. Smooth spaces on the other hand are ‘open, flexible and contested’, characterised by free movement, and with no defined

point to be reached (Savin-Baden 2008a, p.13). Although she does not specifically describe liminal space in this way, she does suggest that smooth and striated spaces interact and influence each other, and it is at the borders where the trouble is often found (Savin-Baden 2008a, p.14). Land *et al.* (2014a, p.4) also talk about boundaries and openness in their exploration of liminal space, influenced by Douglas's ideas (an architect), who suggests that we need to see space as something which 'connects' us rather than as 'a container' (Douglas, 2011; cited in Land *et al*. 2014a). Land *et al.* (2014a, p.4) also argue that we need to find ways of helping students move from one point to another in their learning, so creating points of connection may help students navigate liminal spaces. One way to do this might be to use a particular strategy such as asking for advice. My research investigates the strategies used and how productive they are for students.

An unexpected space?

Allen (2014, p.33) claims that liminal space becomes less daunting and full of potential, if one chooses to enter it - 'jumping rather than falling or being pushed', raising issues about power and agency. Giddens (1991, p.113) suggests that 'fateful moments' are sometimes engineered by individuals and sometimes imposed on them. Thomson *et al*. (2002, p.342) similarly map young people's experiences using a 'choice v fate continuum', determining how much events were within young people's control and how they responded. Whether a 'critical moment' became a fateful one depended on the individual's response to the event, which itself depended on the ability to exercise agency and access the necessary resources and opportunities (Thomson *et al*. 2002). Savin-Baden (2008b, pp.81-82) suggests that the unexpectedness of finding oneself in a liminal space means that students are not prepared for it. This raises questions for my research concerning whether the students' experience of challenge and difficulty felt unexpected, how much control they believed they had in the process and how able they were to access resources.

A creative space: temporary or permanent?

Liminal space has also been linked to creativity (Allen 2014; Land *et al.* 2014a; Osmond and Turner 2010). In analysing interviews with HE staff and design students, Osmond and Turner (2010, p.353) describe liminal space as 'being stuck in a bubble' suggesting that this is important to the creative process. When students tolerated uncertainty they gained 'confidence to challenge' and could work with design briefs involving so called 'wicked problems' (Osmond and Turner 2010, p.361). Allen (2014, p.33) claims it is the mix of 'uncertainty, possibility and constraint that characterises creative practice' and argues that creativity might actually involve constantly being in a liminal space. Osmond and Turner (2010, p.359) propose that an explicit discussion about being stuck in the bubble might help students develop coping strategies, allowing them to be aware of the design process. However, they note that this discussion might also hinder creativity which requires designers to fully immerse themselves in the process.

A positive space?

If liminal space is a creative place, it might also be a productive and positive one. As mentioned, Savin-Baden's (2008b) Mode 5 knowledge suggests it is helpful if an individual can treasure the stuckness. A key part of seeing disjunction and liminality positively involves tolerating uncertainty and uncomfortable feelings. I have already highlighted that when working with HE students, many interpret being stuck as a problem which reflects negatively on them and not as a place to be treasured. Land ***et al.'s*** (2014a, p.1) view that liminal space has both a 'conceptual' and an 'affective dimension' is important for my study, since how students experience this space may influence how they respond to difficulties. I explore the role of feelings and emotions later in this chapter.

A transformational space?

Threshold concepts are defined as transformational (Meyer and Land 2003; 2005; Meyer *et al*. 2010) and it is also an idea associated with liminal spaces

(Savin-Baden 2008a). Much has been written about transformation and it is a difficult concept to define, making it hard to identify when it occurs. Mezirow (2009, p.92) defines his theory of transformative learning as:

> 'the process by which we transform problematic frames of reference (mindsets, habits of mind, meaning perspectives)…to make them more inclusive, discriminating, open, reflective and emotionally open to change'.

Mezirow usefully distinguishes between two elements making up a frame of reference – a 'habit of mind' and the resulting 'point of view'. He suggests that points of view are 'more accessible to awareness, to feedback from others' than habits of mind and although a particular experience might change someone's point of view of it might not change their habit of mind (Mezirow 2009, pp.92-93).

Savin-Baden (2008a, pp.71-76) distinguishes changes or spaces which are 'transitional' from those which are 'transformational'. Transitional spaces involve a shift, but transformative spaces involve an 'identity shift' – involving changes in self-perception and new perspectives on the 'political, social and economic ways in which life is lived' (Savin-Baden 2008a, p.74). Therefore both transition and transformation processes may have liminal qualities (Savin-Baden 2008a, pp.72-76), but all liminal spaces may not necessarily be transformational.

Schwartzman (2010, p.40) contrasts 'deep cumulative learning' and 'transformative learning'. The former involves switching between 'thematic foci', but 'within the same field of consciousness'. It is a 'refinement and clarification of one's extant meaning frame' through the process of reflection. Transformative learning involves incorporating new elements into one's field of consciousness and entails a 'reformulation of one's meaning frame' through a process of 'reflectiveness'. She suggests that this distinction raises questions about whether threshold concepts should apply only to content requiring transformative learning, or also apply to that depending on deep cumulative learning.

The discussion above suggests that not all change and deep learning is necessarily transformational. We need to be cautious about assuming that students go through a transformational experience when facing challenges, difficulty and stuckness. For Mezirow (2009, p.92) transformed frames are better because they are 'more likely to generate beliefs and opinions that will prove more true or justified to guide action'. However, who makes the judgement about what is better and what is more true: the student, the teacher, or the wider learning community? Therefore there are questions about the power relationships existing in liminal spaces. Some forms of liminal space are 'socially sanctioned' and others may be seen as less acceptable or 'transgressive' (Savin-Baden 2008a, pp.130-131). Her argument is that it is possible to see different 'liminal identities' and 'threshold identities' which emerge when coming out of liminal space (Savin-Baden 2008a, p.131). Liminal and postliminal variation is also recognised by Meyer *et al.* (2008, p.68).

Students' responses to disjunction and liminal space

Drawing on her previous qualitative studies with students in HE, Savin-Baden's (2006) framework for students' responses to disjunction recognises that decision-making may be conscious and/or unconscious. *Engagement* is a student acknowledging the existence of disjunction, attempting to understand its causes (a 'reflexive examination') and moving towards 'a greater sense of integration'. She distinguishes between the responses of *avoidance* (using strategies to bypass the disjunction) and *retreat* (choosing not to manage the disjunction, perhaps by taking up a particular fixed position on the issue). Two further responses are *temporising* (acknowledging that the disjunction needs to be dealt with, but postponing the decision about how to manage it) and *postponement* (recognising disjunction and through experience actively deciding to put the problem on hold) (Savin-Baden 2007, pp.12-13).

Schwartzman (2010) uses a phenomenological approach to explore data from a case study of her own HE computing science students. She proposes a similar framework to Savin-Baden using the concepts of 'reflectiveness' and 'defensiveness' to explain how students respond to disjunction, which she refers to as 'rupture and explicitness' (Schwartzman 2010, p.34). Defensiveness

involves the student avoiding the difficulty by 'recasting' the source of the problem, for example attributing the difficulty to how the task has been set. Reflectiveness involves the student 'taking on the challenge of uncertainty and its affective components'. Schwartzman (2010, p.35) accepts that understanding the mechanisms of reflectiveness is partial, but suggests the following steps:

- 'Explicitness forces the inadequacies – and the existence- of one's meaning frame into...consciousness awareness'.
- A 'conscious and unconscious examination' of the meaning frame takes place to identify 'its inadequacies and correct them'.
- The 'reformulated meaning frame' which allows for the incorporation of the 'troublesome knowledge' comes into place.

Student feedback collected at the end of a semester by Schwartzman (2010, pp.37-38) which involved retrospective interpretations could be described in terms of defensive or reflective responses, but it was much more difficult to distinguish these responses from feedback collected during a task when students were experiencing uncertainty and confusion. She notes that anxiety during a task does not indicate a defensive response and that a reflective response is not without these emotions. Framing student responses in terms of 'inadequacy / adequacy' is therefore problematic and does not capture what is going on (Schwartzman 2010, p.39). She prefers to use an 'inauthenticity / will to authenticity' frame, defining 'will to authenticity' as a situation where students want to address the real problem despite their feelings of anxiety. Her suggestion is that this notion can help teachers to understand what might be motivating students (Schwartzman 2010, p.39).

Cousin (2006, p.138) also explores student emotions while experiencing disjunction or liminality, drawing on student data from nine UK universities as part of the ETL project (2001-2005)[3]. She describes her term 'emotional capital' as a 'complement' to Bourdieu and Passeron's (1977) metaphor of cultural

[3] Data collected from interviews, focus groups and observations with staff and students as part of the Enhancing Teaching-Learning Environments Project (2001-2005). http://www.etl.tla.ed.ac.uk/project.html

capital. Emotional capital consists of a ‘set of assets’ as opposed to ‘facility to process emotional issues’ associated with emotional intelligence (Cousin 2006, p.138). She states she is not aiming to focus the discussion on the pathologies of individuals, but to situate this metaphor within a social context, recognising the complexities of students’ emotional experiences. Her argument is that students with greater ‘experiential proximity’ to a topic bring more ‘emotional capital to their understandings of them’ (Cousin, 2006, p.138). Although Cousin (2006, p.138) does not specify what assets might comprise emotional capital, she suggests that experiential proximity includes areas such as ‘family and school cultures’, ‘ethical sensibilities’, ‘political awareness’ and ‘social positioning’.

Cousin (2006, pp.138-144) connects emotional capital with four positions which students might take in response to liminality, set within the context of the Cultural Studies topic ‘otherness’: The spectator or voyeur ‘gazes at the other without looking at himself/herself’, taking a distant and disinterested position; The defended learner may be resistant or hostile to learning about the other; The victim-identified learner may over-identify with the other and may express anger about the other’s situation; The self-reflexive learner may have personally connected with the issues which has ‘effected a personal change’. These responses resonate with Savin-Baden and Schwartzman’s frameworks, but highlight more acutely how difficulties with particular subject areas can connect closely with students’ personal experiences, and the importance of recognising the variety of ‘emotional capital’ which exists in a student group. Cousin (2006, p.144) discusses how these different responses need to be sensitively facilitated in the teaching context and points out that ‘how this experience is viewed and harnessed to the learning is clearly a pedagogic question’.

How might students manage disjunction and liminal space?

In exploring ideas about liminal space and ways in which students respond to disjunction and liminal space, strategies emerge for managing the process. Savin-Baden (2008b, pp.82-84) suggests several approaches, although they are challenging and individuals may not find them straightforward to engage with:

- *Embracing dilemmas:* Dilemmas are often ignored in HE because in speaking publically about them we risk sounding 'incoherent' and 'contradictory' (Savin-Baden 2008b, p.83).
- *Living with tensions and moving between tensions iteratively.*
- *Living with open boundaries:* This involves accepting that boundaries are uncertain and changing.
- *Valuing doubt:* This involves accepting doubt cannot be removed from our interactions and valuing it as a 'central principle of learning' (Savin-Baden 2008b, p.83).
- *Acknowledging the importance of 'third spaces'*: These challenging spaces are often 'polycontextual, multivoiced and multiscripted' but offer opportunities for learning and transformation (Gutiérrez *et al.* 1999, p.287).

Particular student dispositions or qualities might mean they are more able to deal with uncertainty and cope with disjunction and liminal spaces (Land *et al.* 2014a; Rattray 2016). Land *et al.* (2014a, p.10) discuss research on 'Psychological Capital or 'PsyCap' defined as an 'individual's positive psychological state of development' (Luthans *et al.* 2007) and includes

- *self-efficacy* or 'having confidence to take on and put in the necessary effort to succeed at challenging tasks',
- *optimism* or 'making a positive attribution about succeeding now and in the future',
- *hope or* 'persevering toward goals and, when necessary, redirecting paths to goals in order to succeed', and
- *resiliency or* 'when beset by problems and adversity, sustaining and bouncing back and even beyond to attain success'. (Luthans *et al.* 2007).

Avey *et al*. (2011, p.128) highlight that although 'positive psychology' has its critics there is 'considerable growing scientific evidence of the value of a positive mind-set and positive beliefs in one's relationships, wellbeing, and work'. Although I largely agree, care needs to be taken not to dismiss feelings which might not fit into this 'positive' framework. Luthans *et al.* (2007) suggest that these traits do 'show some malleability'. Therefore more research on the

role of PsyCap in learning contexts and in managing liminal space is needed (Land *et al*. 2014a, p.11; Rattray 2016, p.74).

Another way of managing disjunction and navigating liminal space is through Savin-Baden's (2008a, pp.109-111) 'Learning Bridges', mechanisms that help connect past and present positions and enable shifts to be made. These bridges could be viewed as the 'connective points' which Land *et al.* (2014a, p.4) suggest are important in managing liminal space. Learning bridges can include

- developing a new (epistemological) position,
- recognising 'new modes of knowledge' (Modes 3, 4, 5),
- 'honing of critique',
- 'reviewing prior experiences of learning', and
- 'legitimating experience'.

Learning bridges relate to the influencing factors discussed previously. If students can identify factors influencing their experience of disjunction or liminal space they may be able to form a learning bridge which helps them manage the process. Creating a learning bridge therefore involves students in reflection and reflexivity. Savin-Baden (2008a, pp.107-110) and Schwartzman (2010, p.35) have highlighted the importance of this process in managing disjunction and this is possibly a key strategy. Savin-Baden (2008b, p.84) suggests 'the main catalyst for moving out of a liminal space in learning is…, a sense of understanding ones story better and "in relation" to other stories, theories or texts.' My research process provides an opportunity for students to reflect on their experiences, and potentially identify influencing factors and how they manage difficulties.

The idea of 'managing' a process raises a question concerning who should be involved in that management. The experience of disjunction and liminal space is a personal one and the ways of managing this described above are focused on the individual. This implies that the individual student is responsible for their actions and emotions within the process and the resulting learning. However, in a learning environment like HE, the teaching and support staff also have a

responsibility for creating conditions which encourage learning to take place. Part of this responsibility is to support students when they experience difficulties.

There are several suggestions for teaching interventions which might help students understand threshold concepts (Land *et al.* 2016; Land *et al.* 2008; Meyer and Land 2006; Meyer *et al.* 2010). A recent study (Berg *et al.* 2016, p.213) identified 'learning strategies' such as students 'doing exercises by themselves' as a way through liminal space. However, there are gaps in the literature regarding discussions about the range of strategies students use in liminal spaces. Savin-Baden's (2007, p.9; 2008a, p.104) model of transitional learning spaces shows a movement beyond liminal space into engagement, learning bridges and transitional or transformational spaces. She suggests that little has been discussed about this process (Savin-Baden 2008b, p.82). There is often insufficient support for students who are trying to manage its complexity (Savin-Baden 2006, pp. 165-166). Schwartzman (2010, p.26) also calls for more understanding of how to support students through difficulty. My research explores how students respond to and manage this process and how the actions of others might impact on this.

The role of feelings in students' experiences of challenge, difficulty and stuckness: a connecting theme?

The previous sections highlight the influence of feelings and emotions, suggesting they play a potential role in understanding the students' experience of challenge, difficulty and stuckness. It is useful to firstly explain what might be meant by 'feelings' and 'emotions' in the context of learning. The two terms are often used interchangeably and their definitions are a source of debate (Efklides and Volet 2005, p.377). Metacognitive feelings such as 'feeling of difficulty' can be distinguished from other emotions present during learning such as interest, boredom, anxiety or anger (Efklides and Volet 2005, p.377). Metacognitive feelings 'monitor cognitive processing and trigger control decisions related to it, whereas emotions control action that leads to engagement or suspending of action related to learning' (Efklides and Volet 2005, pp.377-378). I will use the concept of metacognitive feelings where appropriate and generally use the term

feelings rather than emotions to refer to other affective states, unless I am referring to a term used by a specific author.

Efklides (2008, pp.279-280) argues that metacognitive feelings are both cognitive and affective in nature and that affective elements have been less studied. Efklides and Petaki's (2005) research with school students studying mathematics found that 'feeling of difficulty' illustrates this relationship well, as it is associated with negative affect. There are two feedback loops which explain the affective character of metacognitive experiences during tasks: one detects 'the discrepancy from the goal set', and the greater this is, the more negative affect experienced; the 'metaloop' monitors how quickly the goal is being reached and results in either positive or negative affect (Efklides 2008, p.280). The absence of processing fluency creates a feeling of difficulty which explains why feeling of difficulty is associated with negative affect (Efklides 2008, p.280).

The question is whether the negative affect experienced by an individual has an impact on their learning. Efklides and Petkaki (2005, pp.415-416) suggest that positive and negative affect have implications for learning and claim that much research refers to the relationship between mood and cognition, rather than the effects of mood on metacognition. In relation to cognition they suggest that positive mood results in thinking which allows students to be more creative and take risks, but may lead them to overestimate the likelihood of success. In contrast negative mood can result in more careful and analytical thinking, but if this negativity is too excessive the effort is diverted to dealing with those feelings rather than processing the information (Efklies and Petkaki 2005, p.416). Students with a 'positive academic self-concept' make improvements since they are able to accept negative feedback and take on difficult tasks (Efklides and Petkaki 2005, pp.416-417). This connects with Luthans *et al*.'s (2007) idea of 'Psychological Capital (PsyCap)' discussed previously which might help students manage difficulties.

Another example of how affect influences metacognitive feelings relates to extrinsic feedback. Efklides and Dina (2004) found that students who received positive feedback after a mathematical task (regardless of their actual performance), tried harder and reported more satisfaction when repeating the

task. The opposite was found for students receiving negative feedback. Although the detail of the feedback is not discussed, they concluded that it was impacting upon how students interpreted their metacognitive experiences between repetitions of the task.

Efklides and Petkaki (2005, p.416) claim that research into mood and cognition indicates a bi-directional relationship and their findings demonstrate a complex relationship between mood and metacognitive experiences. Sansone and Thoman (2005, pp.508-510) make several comments on this relationship. Firstly they suggest that emotions can influence students at different stages in the learning process, so their impact over time is important. Secondly, they call for emotions to be included in models of self-regulation, since students are 'monitoring their feelings in addition to monitoring their progress, with perceived progress only one possible source of those feelings'. Finally, they challenge the view that some negative emotions (such as anxiety) are 'bad' for learning and positive emotions (such as interest) are 'good' for learning, arguing for a more dynamic pattern of emotional experiences occurring over time and within different contexts. They conclude that more research is needed in order to understand how these patterns of emotions impact on individuals and learning outcomes.

Others also call for greater consideration to be given to the role of feelings in a variety of learning processes. Schwartzman (2010, p.34) suggests that a 'rupture in knowing' involves both cognitive and emotional elements and refers to Segal's (1999, p.87) comment that being attentive involves 'high emotional arousal, either anxiety or excitement'. Timmermans (2010, p.5) argues that the affective nature of learning is 'often minimised, denigrated or altogether ignored' and cites Kegan's Constructive-Developmental Theory (1982) which she suggests acknowledges 'the equal dignity of cognition and affect'. In the context of criticality, Thayer-Bacon (1998, p.137) argues that emotion, intuition and imagination should be included alongside reason in critical thinking theory. She claims that emotions help us choose the questions we want to address because we feel 'troubled', 'unsettled', 'excited' or 'inspired' (Thayer-Bacon 1998, pp. 141-142).

There are gaps in the literature regarding the role of feelings in the learning process. How conscious we are of them and what role they play within the learning context is a complex area for debate. However, feelings weave themselves through the learning context, acting as influencing factors and interacting with other catalysts to disjunction. They are also important in understanding how students experience and manage disjunction and liminal spaces. My research examines the feelings students experience when confronted with challenge, difficulty and stuckness, factors influencing those feelings, and interactions with the learning process.

Conclusions and research questions

Section one of this chapter introduced the threshold concepts framework and the concepts of disjunction and liminal space. Although I am not aiming to identify specific threshold concepts my research does identify the challenges students are experiencing in their academic studies. Empirical research on threshold concepts and Perkin's (2007) discussion on 'Theories of Difficulty' emphasise the importance of teachers identifying conceptual difficulties which relate specifically to discipline content and their potential causes. However, my research is firmly located in understanding the students' experience of challenge, difficulty and stuckness and explores the interaction between specific challenges.

In section two I examined potential factors influencing challenge and difficulty in more detail, drawing heavily on the frameworks of Savin-Baden (2008a) and Efklides (2006a). The discussion focused on task-related factors, those connected to an individual's beliefs and learning stance, and the influence of the discipline being studied and its interaction with learning processes. Although my research questions do not focus on any specific factors, my aim is to clearly identify those which influence the students' experience of challenge, difficulty and stuckness and what the relationships are between these factors.

My first research question and sub-questions are therefore

How do students experience challenge, difficulty and stuckness in the learning context during the academic year?

- What challenges do students experience?
- How do students understand the causes of these challenges?

This chapter has also explored theoretical discussions and empirical studies which explain the process of being stuck and being in liminal space. I have highlighted that the experience for an individual can be a complex non-linear process, partly captured in Savin-Baden's (2007; 2008a) model of transitional learning spaces. The discussion also examines the ways in which individuals might respond and manage disjunction and liminal space and indicates a role for feelings in understanding the students' experiences. Savin-Baden (2008b), Schwartzman (2010) and Land *et al.* (2014a) all suggest that more needs to be understood about how students respond to disjunction and in particular how they experience and navigate liminal space. This is where my research can make a specific contribution by assessing how students respond to disjunction and manage being in liminal space, how these responses change over the academic year and the role feelings play in the process.

My second research question and sub-questions are therefore

How do students respond to and manage challenge, difficulty and stuckness in the learning context during the academic year?

- How do students respond to challenge, difficulty and stuckness?
- How do students describe their experience?
- What strategies are students using to manage the process?
- How do students understand their choices in relation to these strategies?

Chapter Three: Methodological Considerations

Designing a research project is a complex process. Savin-Baden and Major (2013, p.46) suggest that a researcher uses a series of 'lenses' to explore the topic under investigation. I have structured this chapter using four lenses: situating the research (the paradigm and the research approach); data collection; data analysis and interpretation; and ethics and quality issues. Each lens represents a series of decisions which together shed light on how I viewed the data. However, decision making was not linear, involving movements backwards and forwards between parts of the process, often with decisions being made concurrently. Throughout the chapter I point out how and when connections between parts of the research process were important. Figure 3 summarises the research process.

<table>
<tr><td>Decisions on research design

Ethics approval form agreed</td><td>Discussions with key staff and small group of final year students from Allied Health Professionals Course (AHPC)

Pilot interviews</td></tr>
<tr><td colspan="2">Presentation to student cohort from AHPC
Sampling conducted
Information meetings with potential participants</td></tr>
<tr><td colspan="2">First interviews conducted (term one)</td></tr>
<tr><td>Email questionnaires sent out
(term one and two)</td><td>Initial analysis phase
(used to inform second interviews)</td></tr>
<tr><td colspan="2">Second interviews conducted (term three)</td></tr>
<tr><td colspan="2">Transcription of interview and email data</td></tr>
<tr><td colspan="2">Main analysis and interpretation phase (constant comparison and coding of data)</td></tr>
</table>

Figure 3: Sequence of planning, data collection, analysis and interpretation processes.

Situating the research

The choice to undertake qualitative research

A qualitative research approach seemed appropriate for exploring students' experience of challenge, difficulty and stuckness. As Savin-Baden and Major (2013, pp.12-13) explain, 'Qualitative research helps researchers understand individuals, cultures and other phenomenon rather than to analyse relationships between variables or to test cause-and-effect relationships'. To understand students' experiences I needed to generate 'thick descriptions' (Geertz 1973) and detailed accounts. Relying primarily on quantitative data would not allow me to understand the 'process' of meaning and how students make sense of their experiences (Merriam and Tisdell 2016, p.15).

My philosophical perspective underpinning the qualitative research

Explaining my philosophical position entails clarity about how my views of reality (ontology), and of knowledge and how it is generated (epistemology), interact with my research questions and process (Savin-Baden and Major 2013, p.54). My aim is to understand individual students' experiences and I believe that individuals create their own subjective interpretation of the world and their own truths. Similarly individuals constantly interact with their environment, so 'reality' constantly changes. Biesta and Burbules' (2003, p.66) reading of Dewey's pragmatism asserts that knowledge 'is always provisional', therefore my research outcomes will be an interpretation of reality at a certain time point in a specific context.

The constant interaction of individuals with their environment explains how I see knowledge being created in my research. Students will create 'knowledge' by interpreting their interactions with their environment. Simultaneously I will create knowledge by interpreting my interactions with my environment (i.e. the students and their accounts). This view of knowledge creation is consistent with an idea derived from Dewey's pragmatism, 'transactional realism' (Sleeper 1986, p.3). This asserts that knowledge is 'a construction that is located in the organism-environment transaction itself…it can be argued that knowledge is at

the very same time a construction *and* based on reality' (Biesta and Burbules, 2003, p.11) [italics in original].

The research approach

Dewey's view of 'experience' as a transaction resulting in knowledge creation influenced my research approach. For Biesta and Burbules (2003, pp.45-46) time is important in understanding Dewey's view that action and reflection are key elements of knowledge creation. The decision to follow students through an academic year provided time for them to encounter challenges and act upon their environment. The research process also created spaces for them to reflect on this action. I therefore decided that a Qualitative Longitudinal Research (QLR) design allowed me to explore the student experience over time. Saldaña (2003, pp.3-5) hesitates in defining a specific amount of time which makes a qualitative study longitudinal, but suggests nine months (or an academic year) as a guideline for educational research. My time frame was a ten month period September 2013 to June 2014 inclusive.

Time is an important concept within QLR and studies reveal 'processes and the relationship between a linear clock time and the complexities of time as lived that encompasses subjects and researchers' (Thomson *et al.* 2014, p.12). The time frame chosen by the researcher affects what they observe and with a 'wider temporal perspective the linear gives way to the cyclical' (Adam *et al.* 2008, p.8). In the literature review I discuss how the experience of challenge, difficulty and stuckness is described as non-linear (Meyer and Land 2010; Savin-Baden 2007; 2008a). I therefore needed to attend to how these processes might operate differently over time. For Adam *et al.* (2008, p.7) time is 'complex and multi-dimensional', so in addition to the study timeframe, other 'types' of time may impact upon the students' experiences. For example, *timing,* how individuals co-ordinate different actions or perceive them to be happening at the right or wrong time; *tempo*, the 'speed, pace and intensity at which activities are conducted'; and *sequence,* whether experiences or actions occur in a particular order, happen concurrently, or are prioritised (Adam *et al.* 2008, pp.8-9). These 'types' of time and their relevance to the students' experience are explored further in the findings and discussion chapters.

Another dimension of QLR is change through time (Saldaña 2003, pp.7-8). Although the research questions were not focussed on any specific changes through the academic year, students' perceptions of changes in their experiences of challenge, difficulty and stuckness were of particular interest. Assessing change 'requires at least two reference points through time' (Saldaña 2003, p.7) and my research involved interviewing students twice in order to achieve this. Multiple interviews are common in QLR designs (Thomson *et al*. 2014, p.12). Interview one was in term one, after the students had had time to settle into the academic work. The second interview was in the third term towards the end of the academic year. It was not practical to interview students in term two, as they were in work placements across the region's hospitals. During this time I used an email questionnaire to assess their experiences instead.

This design could be criticised for limiting me to capturing 'snapshots' of the students' perceptions at the points of interview and email responses (Neale and Flowerdew 2003, p.191). However, Neale and Flowerdew (2003, p.190) use Berthoud's (2000) 'snapshot' to 'movie' metaphor to explain how QLR designs create opportunities for capturing a more 'dynamic' picture. In particular the use of repeat interviews allowed me to incorporate both prospective and retrospective elements (Thomson and McLeod 2015, p.246). In interview one, the students could reflect on the term so far and think ahead to the coming months. Interview two included discussions about the future, but was mainly an opportunity to reflect on the year and consider changes they had experienced.

Data collection (theoretical considerations and the practical process)

Before choosing participants I made two further decisions regarding the context for data collection.

Several factors influenced my decision to choose AHPC students. I am not a member of the AHPC department and I have never studied the subject, but I have worked with departmental lecturers for several years and co-taught academic skills workshops for a year one module. I therefore have good working relationships with staff, facilitating access to a participant group. There

was also sufficient distance between myself and the students, as I did not know them well and I was not involved in formally assessing them. I did know that each student intake included individuals from a wide range of ages and backgrounds and that the course has a diverse curriculum including mathematics, physics, patient care, clinical imaging and research methods. Students also undertake hospital placements, so they study in both work-related and academic environments. Students are also assessed in a variety of ways, including exams, written assignments and practical assessments. The literature review highlights the role of factors related to individual students, the subject studied and the task set, in influencing experiences of challenge and difficulty. I concluded that sampling this cohort of students would maximise my access to the diversity of student experiences.

The second key decision was to collect data throughout the second of the students' three year degree programme. During my planning period (February to August 2013) I informally interviewed a small group of AHPC students (four males and one female) who were nearing the end of their third year. They agreed that the second year was the most challenging in relation to the content and to time management. This was confirmed in interviews with the Head of Discipline (HoDis) and the Director of Education (DoE) for the AHPC.
I discussed my research design with the Head of department (HoD), Head of Discipline, Director of Education and a Lecturer, who all supported the study proceeding and the HoD signed an agreement form (appendix 2).

The participant group

Sixteen participants were drawn from the AHPC second year cohort (13 females[4] and 3 males). Seven of these were mature students (Higher Education Statistics Agency 2016)[5]; six had studied outside the UK; and they had a range of entry qualifications including Access courses, BTEC diplomas, A Levels and international equivalent qualifications (see appendix 3).

[4] Two students chose the pseudonym Lucy, so they are referred to as Lucy1 and Lucy2.
[5] A mature student is aged 21 or over at the start of their course (Higher Education Statistics Agency HESA, 2016).

The sampling process

I first contacted an AHPC lecturer who taught the second year students, who agreed I could make a short presentation during a lecture in week two of the autumn term. This included information about the research topic and design, ethics, confidentiality, participants' involvement, and potential benefits to them (appendices 4 and 5). I also answered questions about the research. I asked students to voluntarily complete a form expressing their interest or not, in joining the study (appendix 6). As the key focus of the study was to understand students' experience of challenge, difficulty and stuckness, the form also asked them how challenging they had found academic work in year one. This gave me some initial information about the cohort's experiences of challenge (appendix 7).

Following this presentation 56 forms were returned (approximately 93%[6]), and 40 students wanted further information. Of these students, 30 stated a preference to attend a group meeting and 10 to meet me individually. For practical reasons I could not include 40 students in the study. Patton (2002, pp.244-245) suggests that small sample sizes in qualitative studies should not be compared to the samples needed in probability sampling. He explains that there are no rules for sample size in qualitative research and that the decision depends on the research questions, what will yield credible data and the time and resources available. Initially I aimed to have 10 students, a manageable number to follow through the year and collect in-depth data from, as well as allowing for some diversity and attrition within the group.

Using the 40 information sheets I employed a stratified, purposeful sampling method (Bryman 2012, p.419). It was purposeful because I was choosing the sample with my research goals in mind (Bryman 2012, p.418). In order to maximise variability, I stratified the sample by gender and year one experience of challenge. Using the resulting groups and in the interest of fairness, I anonymised the forms and randomly allocated the students to either a sample group of 10 or a reserve group. I contacted the sample group, but only three of

[6]The AHPC routinely recruits a cohort of 60 students.

them wanted to participate, so I also contacted students in the reserve group. Although this sampling strategy was theoretically a systematic one, in reality most of the 40 students did not respond to follow up emails, or decided not to participate in the study. Instead I therefore used a 'convenience' sampling strategy, where students were chosen based on their availability and interest (Corbin and Strauss 2008, p.153).

I conducted individual and group meetings with all students who expressed an interest in participating. I explained the research study in more detail and answered questions (appendix 8). I gave students the option of signing the consent form, or taking it away and returning it after further consideration (appendix 9). Eighteen students signed consent forms (15 females and 3 males). This exceeded my goal of 10, but because maintaining sample size in QLR designs can be a challenge (Patrick 2012, p.1), I expected some would withdraw during the year. Actually none of the 18 students voluntarily chose to withdraw. Two were unable to attend the term one interviews, so I excluded them because the absence of their data from interview one made assessing changes over the year difficult.

Data collection methods

My main aim was to explore in depth the students' experience of challenge, difficulty and stuckness. Although methods like questionnaires with open-ended questions can provide detailed qualitative data, interviews allowed for a richer set of responses. Interviews also created the potential for exploration (Brinkmann and Kvale 2015, p.199), providing the opportunity to ask follow up questions and clarify points. For Patton (2002, p.340) interviews allow us to find out things that we cannot observe. For example I was able to ask students what they were feeling and thinking and how they interpreted what was going on in their environment (Patton 2002, p.341). As Brinkmann and Kvale (2015, p.199) point out: 'the force of the interview is its privileged access to the subjects' everyday world'.

Interview approach and structure

I used a semi-structured interview approach, a method which 'attempts to grapple with complex experiences' (Cousin 2009, p.72). The interview's flexible structure was key in helping me manage the complexity; it has a series of 'questions or issues' to be explored, but the order and exact wording can be varied (Merriam and Tisdell 2016, pp.110-111). The first interview with each student included a broad opening question regarding what they found challenging or straightforward within their academic study. I then aimed to cover a series of topics with a list of questions under each topic area. These were used in a flexible way according to the student's responses (appendix 10). A weakness of semi-structured interviews is that although they allow for some flexibility, they can limit the extent to which an individual's 'unique perspective' can be captured (Savin-Baden and Major 2013, p.359). As it was important for me to understand each student's experiences in detail, I included some unstructured space in the interview for students to take things in their own direction.

Terms used in the interview

In the discussion I had with the small group of final year AHPC students prior to the pilot and the main interviews, I was able to check an important issue related to terminology. I gave them three words *challenge*, *difficulty* and *struggle* and asked them to write down what these words meant to them. Their feedback suggested that *challenge* seemed to be a more neutral word, whereas *difficulty* and *struggle* had more negative connotations. This informed my choice of language in the interviews. I used the word *challenge* and only referred to *difficulty* or *struggle* if students used these terms first themselves.

Pilot interviews

Before proceeding further, I conducted two pilot interviews with second year students in different disciplines (appendix 11). The timings, topic areas and questions generally worked well, so I did not change these. The pilot interviews did however raise two issues. Firstly, students quickly moved away from talking about academic challenges to personal challenges. My literature review

highlights the impact of personal issues on academic challenges. I did not want to stop students talking about these areas, but because they were not the main focus of the research, I would need bring discussions back at certain points to academic challenges. Secondly, from my professional experience of conducting individual appointments with students I knew that a discussion about their feelings is a sensitive area, particularly when meeting them for the first time. My approach in the pilot interviews of prompting students about their feelings in the context of the different topic discussions, rather than seeing this as a separate area for questioning, proved effective. It appeared to help students feel more comfortable and this was confirmed at the end of the pilot interviews when I informally asked the students for feedback.

Linking the two interviews

During the first set of interviews the topics covered and the depth of responses varied as expected in semi-structured interviews. As anticipated the students included some topics originally not on my schedule. For example, the role of identity, power and personal voice was only followed up if mentioned specifically by the student. These large and important issues are beyond the scope of this research project. The interview time available meant I had to prioritise what I saw as key questions, based on my literature review and the pilot interviews.

The second interview was also semi-structured including specific topic areas, but again with some flexibility. I tailored a schedule for each student after creating a short summary of interview one and identifying areas and questions for follow-up (appendix 12). I could therefore focus on areas students had talked about in interview one, but I could also ask about topics not previously covered and let students raise new issues. Consistent with the QLR design and my research questions I was also interested in changes over the year, so interview two involved more elements of reflection than interview one. I specifically asked whether any changes had occurred over the year in relation to them as students and/or individuals. A challenge with QLR is to ensure that there is ‘structure and focus, using findings from one wave to inform the design of the next’ (Smith 2003, p.275).

The interview context and establishing rapport

Each interview lasted 30 to 70 minutes and was conducted in small, comfortable meeting rooms in a student services centre. This allowed some level of confidentiality since the rooms are used by many different services and students. I wanted students to feel as comfortable as possible, so at the beginning of the interviews I explained the process, the type of questions I would ask and confirmed their consent to the audio recording. I also explained that they could stop the interview or ask questions at any point. At the end of the interview I thanked them, explained the next steps and asked if they had further questions. My professional experience of conducting individual appointments with students has given me an awareness of body language, active listening and checking for understanding during interviews. These behaviours help develop rapport in interviews, a significant challenge according to Savin-Baden and Major (2013, p.370).

The email questionnaire

Although the two interviews with students provided the main data source, I also used a short email questionnaire (appendix 13) for two reasons. Firstly, I hoped to capture some of their feelings at the point when they were actually experiencing challenges and difficulties, so-called ‘in-process data’ (Schwartzman 2010, pp.37-38). This would be difficult to do with only the two interviews. Individual diaries or logs are one approach which can track this type of experience, but given the students’ busy schedule I thought this would be burdensome. Instead I emailed them before the term one interviews and twice in term two. Secondly, I hoped that emails would help maintain contact with participants, which can be problematic in QLR studies (Patrick 2012, p.1). Miller (2015, p.296) suggests that the internet and social media have made this process easier.

I was aware from my professional experience that email feedback often does not yield a high response rate. Nulty (2008, p.303) reports that online survey response rates were 8 to 37% lower than paper-based alternatives, with 47% being the highest online response rate. However, Dommeyer and Moriarty (2000, pp.47-48) found that questions embedded in an email, rather than an

attached questionnaire yielded a higher response rate (37% versus 8%). I therefore used an embedded approach with easy tick boxes and the opportunity to comment in more detail. The rating scale was suggested by the AHPC Head of Department, to give a snapshot of how students were managing challenges at that time-point. I also included the range of positive and negative feelings for students to choose from (appendix 13). I tested the ease and appropriateness of the email questions with the participant group at the initial information meetings prior to the interviews. Their feedback was positive.

On reflection, the email responses did provide snapshots of the students' feelings which was useful data, but in most cases qualitative comments were limited. This underlined the importance of the interview data for gaining an in-depth understanding of the issues. I therefore decided not to report in detail on the email data in the findings and discussion chapters, but used it to inform the overall analysis. In line with the points made above, not all the students responded to the emails (average response rate 65%). Nevertheless all 16 students remained in the study which suggests that even if they did not respond to the emails, the contact with them may have contributed to a sense of belonging to the project and the zero attrition rate.

Data analysis and interpretation

Data analysis was a constant activity throughout the research process. Here, I discuss the processes of transcription, coding, interpretation and presentation of the data.

The transcription process

I transcribed the interview data myself, partly to minimise costs, but more importantly because I was convinced it would enable me to stay close to the data and enrich my analysis (Brinkmann and Kvale 2015; Merriam and Tisdell 2016). It was a time consuming process as I had data from 32 interviews (16 students x two interviews each). Most interviews were 60 minutes long, creating approximately 32 hours (1920 minutes) of audio data. However, the act of moving between immersion while listening and standing back as I transcribed into text, allowed me to understand the data at both 'gut levels and as a whole'

(Savin-Baden and Major 2013, p.420). Having this understanding of the content and structure of the data was helpful before starting the 'breaking apart' process of coding (Savin-Baden and Major 2013, p.420). See appendix 14 for more information on my transcription style.

Analytic approach: constant comparison and the coding process

Thomson and Holland (2003, p.236) explain that a QLR approach to data analysis needs to look in 'two directions', 'longitudinally' and 'cross-sectionally'. I aimed to understand an individual student's experience through the year and to compare experiences between participants. The latter aim was less about identifying significant patterns or 'truths' and more about exploring the diversity of experiences. Thomson *et al.* (2003, p.186) argue that comparison is an important 'analytic and interpretative strategy'. I therefore used 'constant comparison' as an analytic technique, since it can involve the comparison of data between individuals and comparing the same individual's data across time (Charmaz 2006, p.54, p.82). Constant comparison was developed by Glaser and Strauss (1967) as part of their Grounded Theory approach. However, it has now become a more common method of qualitative data analysis for researchers who adapt it for use within other approaches (Savin-Baden and Major 2013, p. 436).

Coding the data is a key part of the constant comparison process. I adopted the two main stages of *open* coding and *axial* coding (Savin-Baden and Major 2013, p.437). *Open* coding is the first stage, with the creation of wide-ranging codes and some initial categories and sub-categories. In *axial* coding links are made between first level categories and codes and it can involve looking for differences, similarities and patterns in the data (Bryman 2012, p.569). It is also a way of 'bringing data back together again in a coherent whole' (Charmaz 2006, p.60). Organising my coding process in this way allowed me to reflect at key points and I believe make better informed decisions.

<u>Stage One: *Open* coding</u>

Saldaña (2013, pp.25-26) advises the novice researcher to practise manual coding before using coding software. I therefore decided to hand-code a

manageable sample of interviews and then reflect upon how the initial codes were developing. I chose six participants who I felt represented a wide range of backgrounds, views and interview material. I used two techniques suggested by Saldaña (2013): I reorganised the transcripts into three columns creating space for preliminary notes and first level codes; I compiled a list of codes which I added to as I worked through the six participants' data. These first level codes were a mix of 'Descriptive coding' (describing the topic or point being made), 'In Vivo coding' (using terms from the participants' own words) and 'Process coding' (capturing 'action in the data') (Saldaña 2013, pp.87-100).

Open coding this data set manually produced 700 initial codes and I was aware that I had 12 more students in the sample. At this stage I did not want to lose or combine any individual codes until I had completed the first level *open* coding for the rest of the students' data. Bryman (2012, p.577) reassures qualitative researchers not to worry about having too many codes early in the analysis, as it is important to remain 'as inventive and imaginative as possible'.

At this point I decided to start using the electronic coding package NVivo 10 to manage the large amount of data and numerous codes. The advantages over hand-coding are noted by Saldaña (2003, pp.28-34): NVivo can organise many codes into hierarchical structures which are easily manipulated and viewed; I could quickly search and view all data extracts highlighted under a particular code, important for a cross-sectional viewing of the data; and the search function displayed how specified codes appeared throughout a students' data set (i.e. across two interviews and email responses) allowing longitudinal analysis.

Before moving the coding process to NVivo and *open* coding the remaining student data, I reorganised the 700 codes into initial categories, a process described as 'code mapping' (Saldaña 2013, pp.194-198). This produced a hierarchy of 10 main categories, 50 second level categories and the 700 initial codes (see appendix 15 for a summary). The 10 main categories included descriptive elements such as types of challenges and strategies, groups of codes relating to feelings, qualities and behaviours and a category 'time-scales' related to changes over the year. More conceptual codes also emerged such as

the ‘boundaries’ category. This included codes representing student comments expressing tensions and dilemmas which seemed to be about attempts to draw boundaries, for example, codes such as ‘prioritising’, ‘deep versus surface learning’ and ‘need to cover everything’ when studying. I explain more about this emerging category in stage two below.

I then transferred the hand-coded transcripts to NVivo and used the software to *open* code the remaining student data. During this process I reviewed the coding hierarchy, renamed some of the 10 main categories (Table 2) and reduced the 700 first level codes to a more manageable 520.

Table 2: The final list of the ten main coding categories

Transition
Challenges
Straightforward things
Placement
Boundaries
Qualities-behaviours
Views on learning
Student strategies
Teaching strategies
Time (feelings, attitudes, behaviours, changes)

Careful thinking was required about when to create a new code or when I coded something against an existing code. As I proceeded the number of new codes decreased**.** Sometimes I did not need a new code to explain a student’s comment. I was either thinking about the issue differently, or the comment was a variation of the same concept. For example under the category *‘views on learning’,* I changed the code *‘more time on task may not improve performance’* to *‘time on task and effect on performance’.* The renamed code then incorporated a spectrum of relevant views. At this stage I adopted a strategy of

highlighting larger sections of text under particular codes which helped preserve the narrative nature of the data.

Stage two: *Axial* coding - moving from analysis to interpretation

With minor changes to categories and codes at this stage, I maintained the hierarchy of ten main categories, 50 sub categories and 520 codes. I therefore aimed to avoid Bryman's (2012, p.569) criticism that *axial* coding narrows the data too early on. I was however seeing more connections between the categories. *Axial* coding can include identifying a 'core category' (Savin-Baden and Major 2013, p.437) which integrates the other categories. Several codes in the 'boundaries' category overlapped with codes in other categories. For example the idea of 'making connections' was a code in the 'boundaries', 'qualities-behaviours' and 'views on learning' categories. For this reason the boundaries theme was emerging as important and I suspected it might be a core category.

I therefore investigated further how the boundaries category connected with other categories. I used diagrams, lists and tables (appendix 16) to explore connections. Savin-Baden and Major (2013, pp.464-465) recognise the usefulness of mapping tools for analysing and interpreting data. I often draw manually or on the computer to help clarify and organise my thinking, particularly when I am confused. While working with these diagrams I constantly returned to the transcripts to check the students' comments. Through this iterative process I identified 12 sub-categories within the main boundaries category.

To be confident that I had identified a core category and that I was not forcing the data interpretation so as to ignore important details, I went through the student data again to see if their comments could be grouped under one or more of these boundary sub-categories (appendix 17). I noted areas which could not be effectively integrated into this framework. For example there were several issues relating to feelings and also 'transition' factors, which seemed important, but did not immediately fit within the boundary category. At this stage I thought that they might be issues which would thread through the analysis, so

I made a note of this. This process developed over a two-month period, during which I kept returning with fresh eyes to review the codes, categories and the idea of the core 'boundaries category' as an interpretive lens.

Eventually four boundary categories emerged:

- *Boundaries around knowledge*
- *Boundaries around Time (and space)*
- *Boundaries around self and others*
- *Boundaries around 'ways of thinking and behaving'*

This process revealed the importance of 'boundaries' as a core category or theme in the data, but I was not yet sure if the four boundary areas above fully captured the story of my data. They seemed to offer explanations for the challenges students were facing, but I was concerned about how they connected to the strategies students used to manage these challenges. There were other connections between categories relating to strategy use. For example a sub-category 'time management' appeared as a code in two main category areas 'challenges' and 'strategies'. This connection raised the point of whether a challenge might become a difficulty when there is no strategy to manage it. Strategy use was therefore an important theme throughout the data. It was through the writing up of the findings chapters that the relationships between boundaries, challenges and strategy use became clearer.

Alongside the coding processes, I used two reflexive techniques to help me begin interpreting the data. Firstly, throughout the analysis stage I wrote reflective notes on issues which appeared interesting or unusual. Saldaña (2013, p.22) suggests that researchers should ask themselves 'what strikes you?' as a way of checking assumptions and positionality. For example I was surprised by the range of strategies students used to manage the challenges and difficulties, as well as how confidence levels impacted on their self-perceptions and behaviours. I had some awareness of these issues from ASA work, but the complexity of their experiences challenged me to think more deeply about the types of support offered to students at the University.

Secondly, Savin-Baden and Major (2013, pp.457-458) suggest consulting the literature at analysis and interpretation stages, as a way of framing the research. I returned to my literature review several times, as elements included there were resonating with coding categories and emerging meanings within the data. I also became aware of issues in the data which I had not emphasised in my literature review, such as the students' focus on exam assessments and the value of placements as a context for learning. I aimed to balance seeing the data with a fresh perspective, as well as documenting connections with previously discussed literature.

Presenting the data analysis and interpretation

My aim was to analyse an individual's data longitudinally, as well as between individuals, an opportunity provided by the QLR design (Thomson and Holland 2003, p.239). I therefore present the data in a way which captures both these elements. Throughout the two findings chapters I include student comments representing the similarities and differences between their experience of challenge, difficulty and stuckness, feelings and strategy use. As the findings chapters progress there is a sense of time passing, so the findings part-two includes more quotes from the second round of interviews and captures more elements of change in the students' ways of thinking and behaving.

The two findings chapters illustrate points using direct quotes from the students as much as possible, although sometimes I have summarised the students' comments. This is consistent with my aim of providing a 'thick' description of the data and to retain the student voice. The quotes are attributed to each student using their chosen pseudonym (appendix 2). There is some discussion of the findings illustrated by the quotes in these chapters and connections made to relevant literature and implications for practice where appropriate. However, the discussion and conclusions chapter draws together the key findings in a detailed thematic discussion, highlighting the key implications for practice. The overall structure of these three chapters can be described as a 'natural presentation' which is suitable for studies that 'demonstrate a process' (Savin-Baden and Major 2013, p.511). Although the findings cover a linear time-scale,

the chapters are designed to take the reader through the students' non-linear experience.

Ethics and quality issues

This section discusses issues of ethics and quality in the research process. In particular I highlight how the QLR design and the research context create specific ethical dilemmas.

Ethical considerations

The ethics approval form was completed and the study approved before commencing data collection (appendix 18).

Informed Consent involved providing information so that a student's decision to participate in the study was made with an understanding of the research process, their involvement and the implications of this. Using a QLR design changes the nature of informed consent, so that it becomes an on-going process (Neale and Hanna 2012, p.2). As McLeod and Thomson (2009, p.23) point out, participants may not realise the level of exposure created through 'the cumulative power of the data set' in a QLR design. I therefore checked consent with the students at several stages in the research process. The initial lecture, information sheet and subsequent meetings provided information and opportunities for questions and discussion. I gave students information about the aims of the research, the 'risks and benefits' to them, the nature of their involvement and their 'rights' within the process, which included the ability to withdraw at any stage (Savin-Baden and Major 2013, p.322) (appendices 4, 5 and 8).

Students could also meet with me as part of a group or individually. The individual meetings ensured that students could ask questions or share information which they might not feel comfortable doing in a group. I also encouraged students to email me with queries or concerns. Although all the students signed a consent form at, or soon after the information meetings, I continued conversations with them about their participation at interview one, through emails and at interview two. This process of 'refresh and remind'

addressed ethical concerns ‘at each wave of data generation’ (Neale and Hanna 2012, p.2).

Another ethical issue arising from the QLR design is how contact is maintained with participants (Neale and Hanna 2012; Miller 2015). Miller (2015, p.298) highlights the tensions involved in repeatedly contacting participants which may ‘feel (potentially) coercive’. I reassured students at interview one that responding to the email questionnaire was optional. However, I was also emailing them to arrange the second interviews and a few students did not respond to this contact. I carefully worded a reminder email in an attempt to maintain contact without applying pressure and which allowed them to withdraw at this stage if they wanted to.

Maintaining and reviewing confidentiality was another on-going ethical issue which I discussed with students at various contact points. In the information meetings and at the start of interview one I asked them to choose a pseudonym and explained how this would be used. My commitment was not to disclose to anyone, including the other students, who was involved in the study, although most of the students seemed unconcerned by this. Their comments in the interviews made clear that they were openly discussing their involvement with each other. Cresswell (2009, p.90) notes that some participants may not want confidentiality in order to ‘retain ownership of their voices’. I believe students saw their involvement as evidence of positive engagement in a research project, one of the benefits I had suggested in my initial talk. Indeed, after the interviews one student asked me to confirm her participation to a third party as part of a job application.

Another confidentiality issue is how data was collected, stored and used. All of the students agreed to audio recording of interviews, but I reassured them that I was happy to make written notes if they preferred. I explained that all electronic data (audio files, interview transcripts, researcher notes and email correspondence) would be stored in my University password-protected account, which is regularly backed up. Paper-based data including signed consent forms or documents linking pseudonyms to real names, was stored in a locked filing

cabinet. The students could access copies of their audio files or transcriptions if requested and one student did ask to see her transcribed interviews.

Confidentiality was also a consideration when making decisions about how to represent the students' views in the written thesis. Several students asked about confidentiality in interview one, particularly when they felt they were making negative comments about the course. I reassured the students that comments used would not be connected to specific members of staff. The challenge in representing these views was to be honest about the issues raised, not avoid controversial or difficult statements and to understand the context in which comments were made and express these constructively. Cresswell (2009, p.92) states that it is important 'not to misuse results to the advantage of one group or another'. My working relationship with the AHPC staff highlighted this dilemma, but I would argue that all qualitative researchers need to be aware of this ethical issue.

The points above are not specific to my research project, but do raise ethical concerns for my role as an Academic Skills Adviser (ASA) in the same institution. Sikes and Potts (2008, p.3) define an 'insider researcher' as someone with 'an attachment to, or involvement with, the institutions or social groups in, or on, which their investigations are based'. I needed to keep staff informed of the aims and progress of my project, without disclosing any specific information provided by the students. Several times I felt conflicted in my role as an insider researcher. For example some students gave me useful feedback about the course structure or specific difficulties they were having with assessment methods, which I knew would be useful information for academic staff. I managed this tension in two ways. Firstly, students could often share their comments directly with staff through established mechanisms for course feedback. I also continued to share my expertise with staff in my job role, which was informed by my discussions with the students. I was however careful not to divulge specific comments relating to individual students.

My dual roles as employee and researcher in the same institution also created ethical tensions regarding my relationship with the students. For example I clarified how I would be separating my ASA job role from my researcher role,

particularly if the difficulties students experienced were seriously affecting their physical or mental health. In QLR, managing research relationships over an extended period 'requires careful consideration of professional boundaries' and of what types of support can be provided to participants (Neal and Hanna 2012, p.3). In the initial meetings I explained to the students that during the research project I would not see them for individual academic skills appointments in my role as an ASA. This ensured that they would not be at an advantage over other students in the cohort. They could of course still use the services of my colleagues. On one occasion I did suspend the interview process early, in order to make sure that the student could access the support she needed. I did not move fully into my ASA role, but did ensure that she knew what support was available. I also confirmed with her that she would be meeting with her tutor to discuss the issues. This was in line with Patton's (2002, p.406) advice that researchers suggest referrals to other sources of support for issues which arise as part of the interview process.

It could be argued that ethical responsibilities relating to confidentiality and representation of data are common to all researchers, particularly when the project requires an extended time in the field. Adler (2004, p.107) suggests that because we are social beings, we are always an insider in some contexts and an outsider in others. However, the dual roles created by researching within one's own institution does require the researcher to be particularly sensitive to potential conflicts. Smyth and Holian (2008, p.39) point out that working through these tensions can lead to new learning and the strengthening of relationships. I hope that my research findings will be useful to staff and students in my institution and it is important for me to share these constructively in a context of change and development.

Throughout the project I developed a 'two-pronged approach' (Neale and Hanna 2012, p.1) to ethical practice: a 'pro-active strategy' of addressing issues prior to stages of the research process and a 're-active strategy' responding to ethical dilemmas as they arose. Two key techniques employed within both strategies were reflective memos and supervisory discussions. Smyth and Holian (2008, p.40) highlight these tools as effective ways to maintain a critically

reflective stance on the role of the insider researcher. I found them important in managing ethical decisions throughout the project.

The quality of qualitative research

The quality of my research is an ethical issue which requires a detailed explanation. I have structured this section in line with Savin-Baden and Major's (2013, p.469) suggestion that researchers should articulate their view of what quality is, how it might be recognised it and what strategies they used to achieve it. There is debate about the use of criteria to define, recognise and accomplish quality in a study (Denzin and Lincoln 2005, p.206; Savin-Baden and Major 2013, p.476). I have heeded the warning not to be over-reliant on criteria, but to ensure that I discuss the practical details of how the research was conducted (Savin-Baden and Major 2013, p.476).

Lincoln and Guba (1985, pp.294-301) developed four criteria, to judge the trustworthiness of qualitative research:

- *credibility (*results are convincing and can be believed),
- *transferability* (findings can be transferred to other contexts),
- *dependability (*findings will 'endure over time'), and
- *confirmability (t*he researcher has attempted to minimise personal bias which might include involving others in confirming data interpretation (Bryman 2012, pp.392-393).

I found these criteria relevant and useful substitutes for those traditionally used in quantitative research (internal validity, external validity, reliability and objectivity) (Lincoln and Guba 1985, p.300). Here I discuss their relevance in my study and describe the strategies I used to address them.

Internal validity is not applicable to my study since it relates to the trustworthiness of conclusions drawn about a causal relationship. My research explores multiple realities and a range of influencing factors, which need to be 'convincing' (Bryman 2012, p.390) and therefore *credible*. One strategy for ensuring credibility is 'prolonged engagement' (Lincoln and Guba 1985, pp.301-303). Cresswell (2009, p.192) argues that the more time spent understanding

participants and their context ‘the more accurate or valid will be the findings’. The QLR design entailed contact with the students for the academic year. Two interviews and email contact, rather than one data collection point, arguably allowed me to collect richer data and gain a more detailed understanding of the students’ experience over time. Lincoln and Guba (1985, p.303) also suggest that prolonged engagement allows the researcher to ‘build trust’. This enabled the students to feel reassured that ethical issues were adhered to and that their input was valued.

The credibility criterion was also addressed by producing a ‘thick description’ (Geertz, 1973) or a detailed account at several stages in the research process. I gave detailed descriptions of the methods used and a critical analysis of limitations and the ethical issues encountered. Savin Baden and Major (2013, p.475) suggest that credibility implies that findings represent ‘some sense’ of the ‘participants’ reality’. A thick description therefore involves ‘showing’ rather than ‘telling’ (Tracy 2010, p.843), so I quoted extensively in the two findings chapters to stay as true as possible to the students’ voice. The creation of thick descriptions relied on my approach of staying close to the data and its diversity at all stages, from my decision to transcribe the interviews myself to the management of a wide range of codes during data analysis.

Negative case analysis (Lincoln and Guba 1985, pp.309-310) is another strategy used at the data collection, analysis and interpretation stages to ensure credibility. It involves seeking out contradictory elements in the data. Although Savin-Baden and Major (2013, p.478) warn this can result in ‘forcing data into themes and categories’, I saw this as a way of taking a critical stance and maintaining diversity. During data collection and analysis I took care not to discount any viewpoint. In particular my coding strategy of retaining many codes kept me alert to alternative and minority perspectives within the data. By using coding categories representing continuums, rather than ends of a spectrum, I could include a wider range of views in a coherent way, so-called ‘multivocality’ (Tracy 2010, p.844).

The use of thick descriptions and grounding the interpretations within the data (Savin-Baden and Major 2013, p.475), should enable readers to make

judgements about the second quality criterion, the ‘transferability’ of my findings to other contexts (Lincoln and Guba 1985, p.316). As mentioned, transferability is often used in qualitative research to replace terms such as external validation or generalisability. Decisions about transferability can only be made if the reader has information about the ‘sending and receiving contexts’ (Lincoln and Guba 1985, p.297), so a detailed account of the research context and my own positionality was important. My research did not aim to make generalisations to other HE student groups, but I did use a form of generalisation about the students within the study. For example I highlighted similarities in the data between the students, which Haggis (2008, p.152) describes as an example of qualitative researchers attempting to ‘create abstractions that transcend the complex particularity of the data’. However, she also points to other possible ‘types of connection’ which do not rely on trying to find ‘deep structural principles’, such as comparing data on individuals longitudinally, something I also did in the study.

‘Dependability’ as a substitute criterion for reliability takes account of the changing nature of reality (Lincoln and Guba 1985, p.299). In my study it is not about others being able to replicate my results, rather that my findings might add to current understanding and inform future studies. Ensuring dependability required me to consider factors relating to ‘instability’ and ‘phenomenal or design induced change’ (Lincoln and Guba 1985, p.299). An audit trail is one way of doing this (Yilmaz 2013, p.320) and involves keeping detailed records at all stages. I kept notes and reflective memos on the students, research design decisions, methods and data collection tools. I also used software applications to store and interrogate the data: Endnote, a database of research papers and NVivo, a database of transcripts and coding strategies. This strategy may not guarantee that research is high quality, but does enable the researcher to avoid missing out important information (Savin-Baden and Major 2013, p.477). I would also argue that including detailed extracts from the audit trail in the appendices, makes the research process more transparent.

An audit trail also ensures the final quality criterion is met, ‘confirmability’ (Lincoln and Guba 1985, p.319). Confirmability essentially relates to whether the findings can be confirmed by others. Although I kept a detailed audit trail,

the individual nature of doctoral research means that other researchers could not verify my data collection methods and findings. However, it could be argued that the nature of the close supervision by two academics acted as a form of 'external audit' or 'expert' checking (Savin-Baden and Major 2013, p.478). As well as commenting on drafts of my thesis, my supervisors critiqued the methods used. Shenton (2004, p.67) observes that 'frequent debriefing sessions' ensure credibility through identifying 'flaws' in the process and highlighting researcher 'biases'.

Researcher bias and influence is a concern addressed by taking a reflexive approach, the final strategy employed to ensure quality and in particular confirmability. Berger (2015, p.220) defines reflexivity as:

> …the process of a continual internal dialogue and critical self-evaluation of researcher's positionality as well as active acknowledgement and explicit recognition that this position may affect the research process and outcome.

I have described my reflexive activities throughout the research process. I was transparent about my background and philosophical stance highlighting how this influenced my research interests, questions, design, data analysis and interpretations. This should enable readers to make judgements about how the conclusions were arrived at (Merriam and Tisdell 2016, p.249). The analysis and interpretation frameworks section includes examples of how systematically questioning the data uncovered issues relating to my assumptions and beliefs. The ethics section stresses the importance of being reflexive as an insider researcher and how supervisory discussions and reflective memos provided spaces to do this. I also used audio recordings throughout the process which helped create an 'internal dialogue' (Berger 2015, p.220), where I questioned my assumptions and processes.

This chapter has explained how I conducted my research and I now move on to describe, analyse and interpret the findings.

Introduction to the Findings and Discussion Chapters

In the next three chapters I aim to give the reader my interpretation of the students' journeys over their second year and in doing so provide a detailed response to my research questions:

How do students experience challenge, difficulty and stuckness in the learning context during the academic year?

- What challenges do students experience?
- How do students understand the causes of these challenges?

How do students respond to and manage challenge, difficulty and stuckness in the learning context during the academic year?

- How do students respond to challenge, difficulty and stuckness?
- How do students describe their experience?
- What strategies are students using to manage the process?
- How do students understand their choices in relation to these strategies?

Chapter four (findings part-one) discusses two challenges for students which I describe and explain as boundary challenges around knowledge. It also explores factors influencing these boundary challenges, the specific strategies students used to manage them and how tensions, expectations and feelings connected with their experiences. Chapter five (findings part-two) discusses the generic strategies students used to manage disjunction and liminal space. Both chapters use the students' words in conjunction with my interpretations to illustrate their experiences and where appropriate, highlight implications for practice. Chapter six (discussion and conclusions) draws together the main findings, shedding further light on the nature of liminal space, the role of challenge in education, the links between challenge and strategy use and implications for practice.

A note about terminology

In the chapters so far I have used the terms *challenge*, *difficulty* and *stuckness*, however the literature review suggested that they are not synonymous. I propose that the term *challenge* describes something which is a potential stimulus for a 'feeling of difficulty'. *Difficulty* could be described as something which is experienced when faced with a challenge. However, the initial discussions I had with students when planning the research suggested that *challenge* implies a more neutral experience than *difficulty*. I therefore use the term difficulty to describe situations where students were finding things *more* challenging. The literature review introduced and explained the terms 'disjunction' and 'liminal space' (or liminality). I have suggested that both disjunction and liminal space are used to describe situations where individuals find themselves in 'cycles of stuckness' (Savin Baden 2007, p.11). *Stuckness* implies that there is no obvious way to approach a challenge or difficulty and that the individual is struggling to move on. It is in this context that I use this term and therefore refer to it when describing the overlapping elements between the experience of disjunction and liminal space. When I am referring to specific theories I will use and explain the terminology proposed by those authors.

Chapter Four: Findings Part-One
Boundary Challenges Relating to Knowledge: Influencing Factors; Specific Strategies; Tensions, Expectations and Feelings

The main challenges cited by the students were managing the volume of subject content, exams and revision, time management and understanding concepts, particularly challenges with partial or fragmented understanding of concepts and processes (appendix 19). Through the students' comments this chapter explores their experience of these challenges and my interpretation of the connection to boundary issues. I identify two key challenges where boundaries around knowledge were unclear and potentially shifting for the students: uncertain boundaries around the breadth and depth of knowledge which raised questions for the students about what they should be learning; and uncertain boundaries around understanding, particularly when encountering 'difficult' concepts and processes.

Challenge one: uncertain boundaries around the breadth and depth of knowledge - what should I learn?

A challenge for Ruby and Matilda was how they managed the subject content in modules. They perceived the content as too large to study to a standard that they felt comfortable with in the time available before the exam deadline:

> *…I think it is just a large volume of stuff that you've got to learn, it's just challenging to go over it and then revise it, as well as being examined. So it got to the point with our exams last week, it was about a week before and I realised I was only just up to date, you know vaguely understanding it all let alone remembering it* (Ruby-interview1).

> *…but it's just too much you know…I'm just overwhelmed with it, literally, and I don't feel like I'm doing anything particularly well. I don't feel satisfied with how I'm learning and how I'm performing and I haven't got any results so I don't know…*(Matilda-interview1).

I interpret this as a challenge where the students were uncertain about where the boundary was around the breadth and depth of the knowledge they needed

to learn. Pressure was created, since understanding these boundaries felt important if they were to pass the exams in the available timescales. As Lucy2 points out, the second year exam marks count towards the final degree classification:

> *Trying to figure out from the sheer amount of information what parts are more likely to be on the exam is daunting….Because the grade matters this year and I want to do well…I am no longer in the position of the year of the pass* (Lucy2-email1).

The students differed in whether they experienced this challenge as manageable, or as an overwhelming difficulty (see appendices 20 and 21). Strategy use (type, timing and effectiveness), and the students' expectations and feelings were significant factors in understanding their different experiences.

One strategy that students like Matilda used, was to assume that at minimum they needed to learn everything presented to them in the lectures:

> *We're learning everything. We're learning disease processes and pathogens which is fascinating, but we can go into a lecture and we'll get a handout…and in those 60 slides could be anything between 8 and 12 different disease processes and things and we're meant to learn them* (Matilda-interview1).

HE students are usually told in their first year by lecturers or ASAs, that the lecture is the basis for their learning and that further reading is expected to achieve good grades. This seems like a straightforward message, but there was some confusion about the meaning of 'extra' or 'outside' reading and how important it was. For example for Alya and Jane, covering all the lecture notes was the first step and extra reading meant going beyond the content of the lectures:

> *You have to include everything in the lecture notes, but also go and read other books*…(Alya-interview1).

> *…I think if you want to get a 40-50 mark then you just learn the lectures. But you have to read around it so much…in Pathology you have to go and read as it is a broader topic…* (Jane-interview1).

However, reflecting back to year one, Jane had felt confused about whether relying on the lecture content provided enough depth to get a good grade in the exam:

> *For Anatomy…I thought it had to be in the text book. I think that was my trouble, but someone else who received a good mark, said I was like going too deep, and to just focus on the lectures. Then I wasn't sure how to revise and what to look for* (Jane-interview1).

Matilda was unsure whether core text books counted as 'extra' reading since she felt that she could not learn anything new from them:

> *…If you want the low grade then you just use what's in the handouts, if you want more, read the core text and use the information to support your argument….So I'm like I can't learn anything extra from the text book* (Matilda-interview1).

Gloria focused on the lecture notes, did extra reading if she had time and did well in the exam, so concluded that the extra reading was not essential:

> *Well they said if you just learn what's on the lecture notes, you will probably get 40% in the exam. But halfway through my revision I was referring to books about everything, looking up articles online. Then I thought this is taking me forever, I've not got the time for this….Then I got 82% with just looking at the lecture notes. So I think they said that to us to try and make us do background reading, cos obviously as a radiographer you would have to do that all the time…*(Gloria-interview1).

Here, Gloria is making a distinction between knowledge gained from reading which was about passing the exams or 'revision' and knowledge from 'other reading' which she did from a professional interest:

> *…I subscribe to a couple of the radiography journals from the Society of Radiographers, so that's quite nice to sit down and have a read of. But I will do that in my own time and not when I'm revising. I wouldn't count that as revision. I think alright it might help me pass the exam if it comes up, but there are certain articles where it's just more beneficial for you if you're working than if you are trying to pass the exam* (Gloria-interview1).

The separation between these two types of knowledge relates to Savin-Baden's (2008b, p.78) discussions about Mode 1 knowledge (of the academy) and Mode 2 (of the workplace). Perhaps both these knowledge elements contributed to

Gloria's good grades, but she was not fully recognising the connections at this point.

Reflecting back over the year, Louise's comment showed how clarification and reassurance from lecturers was helpful in understanding how lecture notes connected to other reading:

> *I just assumed everything was going to come up, so it was more pressure. But now I went to speak to them….They said half of these things are additional information to try and explain the main subject...so it is just trying to help you…it is basically like me going into a book and reading about that information. So instead they have put the book and the lecture notes together, which is very good because they went and put the relevant things…*(Louise-interview2).

Although in term one students like Dennis attempted to cover as much material as possible, this continued to create difficulties and felt like a boundless situation:

> *…I stay up really late, I stay in the library for 2 – 2.5 weeks, every day, take-aways, nights, trying to catch up with my note-cards as I'm quite determined to finish it, like finishing writing all my note-cards before the exam, but that really stressed me out…the vast amounts of information is almost impossible for me to study it all fully* (Dennis-interview1).

In Dennis's previous study he told me he had gained good grades by covering all the content presented by his teachers. He was aware of the difference in his studying now, but was still struggling with the idea of not learning everything:

> *…at GCSE or A Level I can study everything that the teacher tells me… But in Uni it is less spoon feeding and more directed self-study. So I'm still developing at the moment the way to choose the area what I am studying and what I want to really revise on. I am picking bits, selective study, not studying everything that I'm told, because it is simply impossible. I am learning how to do it, I'm still learning it because sometimes I just want to cover everything* (Dennis-interview1).

For Dennis the boundaries around knowledge were shifting. His previous 'naïve' epistemological beliefs about knowledge being fixed and certain (Bromme *et al*. 2010, pp.8-9) were being challenged and he was thinking about how to manage the complexities and uncertainties.

Recognising these difficulties, the students used several strategies to draw boundaries around the material. These primarily involved some form of prioritisation or selective study. One prioritisation strategy was using the exam as the basis for what to learn. As with all closed book assessments, the students did not know the exam content. They perceived that this information was held by lecturers and was beyond their control:

> *…I find myself worrying that I might be concentrating on the wrong things and overlooking areas that might come up in the exams* (David-email1).

This created a tension where lecturers could not tell the students the exam content, but the students were relying on the lecturer to indicate the important topics they needed to learn. They used several methods to work out what the information might be. For example explicit statements about whether a topic was important, or more implicit lecturer behaviours such as whether they talked more about a topic or included more PowerPoint slides on that topic:

> *…Well I think cerebral vascular diseases, I think that is going to come up because there is a huge weighting towards stroke and things. So it's kind of going by the weighting of what is in the handout, that's kind of what we are revising. But I don't know* (Frances-interview1).

> *Yes that is what I noticed that they* [lecturers] *would repeat certain sentences over and over again…but I will notice when they say something again and I'll kind of put a star by it. So when I'm going back reviewing my notes I think okay wait a second, if they have mentioned that four times, surely that must be on the exam* (Lucy2-interview2).

Although some students used these 'hidden' messages as a guide to the exam content, they were aware of the risk of relying on this strategy and often used the word 'luck' when they had revised the correct topics:

> *…you don't know what's going to come up. They could just throw anything in there. So it is just trying to decide which is the most important stuff to learn. It is just really pot luck whether you've revised the right stuff…*(Frances-interview1).

Some students like Julie also used past exam papers to make assessments about the exam content and what she needed to learn:

> *…having looked at the questions and stuff and I think okay this is what I need to know. You can sometimes when you look back at lecture notes you think oh actually if I was to answer this question properly the lectures notes don't do that. But the lecturers do explain that to you. They say, this is guidance, you still need to do your own bit of research and that's fair enough* (Julie-interview2).

Gloria used the term one exam questions to make decisions about what to learn in the term three exams:

> *…I did take an assumption that if they were in the previous exams questions then they wouldn't be in the recent one, which was true. But I guess there is nothing to say it couldn't be otherwise, I just took a risk there. But that is something I've done my whole life, you're not going to have the same question as a past paper. So I don't concentrate on those things as much* (Gloria-interview2).

Another prioritisation strategy the students used was to learn material they saw as relevant to their future career. For example this was a particular motivational factor for Dennis:

> *…Sometimes when I think something is a little bit irrelevant, then I'll just read it through and not make an effort to remember it…so I think I sort of carry an attitude towards being a good radiographer more than being a good exam student. I want to learn more practical and a broader spectrum of knowledge to help with my real work and I know exams are just part of it…and when I study I always think about how this content is going to relate to my practice so this motivates me a lot more. If I'm studying something irrelevant to what I am doing, I will have no motive to do it, why am I studying so hard for something that I won't use in the future* (Dennis-interview1).

Lucy1 also mentioned enjoying those topics that she saw as relevant:

> *We've done a bit on MRI*[7] *and I've quite enjoyed it…it's probably because it's relevant, because it's specific. Part of the thing with the Maths is that… I do laugh when they are talking about x-rays attenuating through a body and things like that and how much comes out the other end. I'm thinking when you go for an x-ray you don't ask the radiographer, oh well how much is still floating around, you know. So I'm not sure as radiographers we're going to take away the maths part of it into our career, we're not going to sit there and work things out* (Lucy1-interview1).

[7] Magnetic Resonance Imaging

Matilda had similar feelings about the relevance of the mathematics and physics topics, but saw the importance of studying and understanding Pathology:

> *Well because the maths in reality I don't even know if I will ever use it doing that job….If something goes wrong with the machine or we have to calculate doses, for the next 5 or 6 years there will be someone way more senior than me who will be doing that. So it doesn't really matter. I understand how x-rays work and I understand the inverse square law and all the stuff I need to know to do the job at that level. But with the Pathology you need to get it. You need to understand. I don't want to read a request from a consultant or a GP and not have a Scooby do what it means!* (Matilda-interview1).

The relevance of material to the workplace also influenced the students' views on what the curriculum should cover. There appeared to be a difference between those students who saw the course primarily as a training ground for the job and those who saw it as a degree which could take them in several directions. Lucy1 and Matilda were mature students making a career change. They were clear that they wanted to be radiographers and mainly wanted to learn topics they saw as relevant to the workplace and the job role. On the other hand Julie was less clear about her future goals and felt happier studying a broader curriculum:

> *…A lot of people moan and are like why are we doing this Project Studies with the research strategies and all that or why are we doing this physics and I'm kind of thinking, saying nothing, but thinking actually I think it is a good thing that we're getting more of a broader understanding, cos I think I'd probably complain more if they were just oh you're only pressing a button, we'll just teach you what exposure you need to use, if that makes sense? Because I don't really know when I've finished the course whether I'll go into Radiography or maybe study something else, so I don't know, I'm definitely gonna stay in the health related area a couple of years*…(Julie-interview1).

It could be argued that for Matilda and Lucy1 there was an inconsistency between the structure of the knowledge they were expected to learn and their epistemological beliefs about what this knowledge should consist of. This conflict affected their learning in that they felt frustrated and less motivated to learn topics which they saw as less relevant to the workplace. However, for Julie, different types of knowledge did not conflict with her belief system, since she felt it was all relevant and gave her flexibility for the future. This suggests

that the relationship between beliefs about knowledge and learning is not just about whether individual beliefs are consistent with those of the discipline (Muis and Franco 2009; Bromme *et al*. 2010), or whether students have fixed or flexible beliefs, but whether they can see the relevance for their own learning and future goals. This finding sheds some light on Mason and Bromme's (2010, p.2) concerns about the need to understand the relationship between epistemological beliefs and learning.

A further prioritisation strategy was to focus on topics or modules which the students felt they were good at, or were interested in and covering other topics in less detail. For example, in year one Jane focussed on topics she was doing well in, because she was motivated by feeling that she was good at something. In hindsight she felt that she should have spread her time more evenly:

> *…the problem with me is once I understand something, instead of moving on to something else I find difficult, I think okay I understand this I can get a really good result and I really focus on it because I want to get the best result possible. Even though I've had that good result now I'm just like let me try and get 10% more (laughs)….I've got to trust the fact that I can understand that now, so you still go over it, but I've definitely got to focus on the other modules* (Jane-interview1).

Although Jane continued to find it difficult to spread her efforts more widely, she told me that she had made progress with this change in strategy by the end of year two:

> *I think I actually had a case where I had one module where I got 69, I did really think oh that is so close to 70, but I had to still look at it but obviously step back from it and think, understand that, but you need to go to the ones that you got 50 and focus on those…*(Jane-interview2).

Liesje focussed on topics which interested her and continued with this strategy throughout the year:

> *…I am being realistic Rachel and thinking I can't learn everything, so I'm just going to learn the things which really interest me and then I know if anything comes up I can answer that and as long as I know enough about the other areas* (Liesje-interview1).

Reflecting back on the year:

> *I got almost 70 in my pathology exam. What I had done is concentrate on things like cancers, because all that it means something to me because I have family members who've died of cancer and it interests me. I'm a bit morbid in that sense. I like to know everything about it….And then the things which didn't really interest me, I would look at and think okay I know that. I know enough to answer a question on it and I've done that all the way through…*(Liesje-interview2).

This could be a risky strategy, but Liesje drew some boundaries around her knowledge, being selective in order to manage the workload within the time she had available. This strategy allowed her to study some topics in more depth, which kept her interested, but she was still able to perform effectively in the other exams. Julie used a similar strategy in term one:

> *…So I think I will probably end up revising what I have learnt and reading through one or two of the good text books and using them as a reference when I'm doing my notes. But I think I will only go to the level in the lecture I wouldn't be probably reading too much around as in like stuff that I don't need to know for the exam. Whereas with the Pathology, because I find it a bit easier, it will be something that I will be comfortable to read….I know this isn't going to be in my exam but I find it interesting and I think it is good to know* (Julie-interview1).

By term three she felt uncomfortable about this process, using the term 'wasting time' to describe doing additional reading, perhaps because it seemed like a boundless activity:

> *I think it is one of those subjects* [Pathology] *as you say you can just kind of get like stuck. You can waste time, not even waste time, as you say you are reading some topic and you think oh I don't know what that is and you look that up and it goes on and on and you are learning more and more. I think when I'm not under pressure, if I'm just studying in general I will do that, waste time, but then I'm sitting there and thinking this has to be beneficial because I'm widening my knowledge I guess. But when it comes to those weeks before the exam and it's the intense study and I know this is what I need to do I am quite strict and I'll just say, no this is what they've covered in the lectures…I'm not going to waste time I'll just do this and keep going. That is kind of the way I try and do it.* (Julie-interview2).

By term three Matilda was also uncomfortable about prioritising in order to pass the exams:

> *…I think in the end I just had to accept that I couldn't absorb it all and I chose topics and I chose subject areas. I had to make, I don't know if it was an informed choice, but I had to sit and look at how much we had covered stuff and think okay well that might come up in the exam. So I may not have learnt what's relevant to our job…I kind of just made a decision to focus…so it just became a passing an exam thing. I don't think that is the right way to do it, but it might be the way it's done. I don't know if that's how uni courses work, it's the first one I've ever done…and it is still not how I want to do it and I think this was a horrible learning experience. I think the first year was a good learning experience… it was the right pace* (Matilda-interview2).

There is a tension here for students like Julie and Matilda between the need to study topics which are about passing the exam and those which they are interested in, or see as important for the workplace. If there is a perceived mismatch between these goals, then the decisions about what to learn can be more difficult, leading to frustration and disappointment. This point is elaborated on further in chapter six.

Challenge two: uncertain boundaries around understanding - encountering 'difficult' concepts and processes

This challenge connects to the previous boundary challenge because it can be difficult to decide what to learn when you do not understand the concepts. At the same time understanding concepts may require in-depth study as well as coverage of several topics simultaneously. This section explores why the students stated that they found certain concepts, topics and processes difficult, what they attributed this to, and how they managed these specific challenges.

Some of the students judged that they were finding a mathematical or written task difficult, based on how long the task took, or how quickly they understood the concepts. Speed seemed to be equated to ease and ability. For example:

> *…there are a lot of really good mathematicians in our class so I wouldn't say I'm amazing at it. I have to spend some time on it and then I can catch on to it* (Jane-interview1).

Gloria and Julie talked about the time it took for them to write an essay:

> *I had to donate two weeks of my time to that cos it just takes me so long, cos I'm not a very good writer and I'll sit there for five minutes trying to think of a word, that kind of thing, so I have to give myself a lot of time. But I've known that all my life, I've never been great at English* (Gloria-interview1).

> *…like the lit review is more literate and if you have a flair for English it is easier to express what you want to say, whereas if you are like me and you struggle a bit, it's quite slow and trying to get through is quite stressful*…(Julie-interview1).

These students assumed that if you are good at something, then understanding should be instant and writing should flow quickly. If it takes time or you have to think about it, then you are not good at it. This relates to Efklides (2008, p.282) research on 'feeling of difficulty', which she suggests can be triggered by a lack of processing fluency. The students did not attribute this feeling to the difficulty of the task, but related it to their 'self-concept of ability' (Efklides 2008, p.282). However, through experience with the tasks and feedback, Gloria and Julie adjusted their views on themselves as writers (their self-concept), and about the time required to produce a good piece of work (the task's difficulty), (Efklidies 2006a; Efklides and Vlachopoulos 2012).

> *My results for the essays are always really good. I got 80% in the case study and 76% on the one for equipment. I still don't like writing them and I still don't think I'm good at writing them, but obviously I'm doing something right! (laughs)*…(Gloria-interview2).

> *…looking back, I think a lot of it with written assignments is that I tend to leave them quite late….I think having talked to some people who are quite good at the written assignments they seem to get stuck into them early and get them written up early…like they might do a draft and edit it three or four times at least before they send the final one. Whereas I think looking back I've just now come to the realisation that my biggest problem is typing it all and then just having a quick flick through and not reading it properly and sending it…I think I really have to address that for third year* (Julie-interview2).

For some students, self-concept was influenced by comparison with others in the group who they saw as 'more intelligent' and who therefore found things easy and did not need to work as hard:

> *But then it depends if you're cleverer, if you're somebody who totally gets physics first time, then you're not going to need to spend time…*(Frances-interview1).

> *I'm thinking I'll probably not get a first, because I'm probably not as smart as the people who, well you can see the people who are really like they breeze it and they don't study very hard* (Matilda-interview2).

Here, the students appear to be separating effort from intelligence. Jackson and Nyström (2015, p.394) argue that in most western cultures 'effortless academic achievement is equated with authentic intelligence'. However, the students' perception of others may potentially conceal a more complex picture. For example David might be viewed by his peers as an 'intelligent' student who did not need to do much work:

> *I seem to have built up this reputation as being quite good at exams so people will ask me. I mean I don't get that good marks, I get good marks….They'll generally come up to me with an exam question and ask how to do this. And I won't have done it either because I don't really do the past papers much until a couple of days before the exams. But usually I can look at it and figure out where it's coming from and tell them where they need to look and what they need to* study (David-interview2).

Although David told me that he completed his assignments and revision in short timescales, he also said that he worked for many hours late into the night, so his study processes were hidden from his peers. He also worried about his grades and study methods and did not always perform as well as he wanted to in the placement assessments:

> *It's generally been, I don't want to say worrying, but it's definitely been harder than the first year. I've been more stressed about not passing, which I'm not now because I think I did fairly well in all of the exams and I seem to have passed everything else. But this has been much more of a panicky year than the first year was….So this is the year where I've come up against, not walls, but proper challenges in studying and had to put some effort in.*

> *…I mean I didn't get great marks in my placement assessment. Well I got good marks in most of them. There was one I specifically didn't. I just passed it…I hadn't done enough of them to be confident in positioning the leg…and the patient was quite shaky and I could get it positioned on there. That sort of threw me and I was nervous for the rest of the year* (David-interview2).

The students also attributed their ease or difficulty with activities to whether they had previous experience of studying the topics or of completing the tasks. David felt that his previous A Level study had been helpful:

> [the science module] *isn't really challenging because, like I said I did physics at A Level and there is a lot of that which carries over and just because in general I quite like Science, it is the kind of thing that catches my attention and I'll read about it in my spare time anyway. So all the stuff we've done in that has been mostly been stuff we've done before, one or two new equations. So no it's easy for me…*(David-interview1).

Aniri recognised her different experiences with mathematics and physics influenced the level of difficulty she experienced:

> *…Calculations were not difficult for me because I did maths at AS level, so I know how to do logarithms, I knew how to rearrange equations, that was straightforward for me.…I would say because I didn't do physics I struggled the most with the theory, the laws of physics and with theory questions…*(Aniri-interview1).

For Frances not having studied enough mathematics, particularly recently, created considerable anxiety:

> *When I first started it, because I only did GCSE maths and only intermediate, we didn't touch on logarithms and exponentials and things. So to be given an equation and shown right you rearrange it and that's what you get there. And it's like but where does that come from? I hadn't got that kind of basic mathematical knowledge. I left maths behind at 16 and I thought I'll never ever have to do that again. There's no way I would put myself through rearranging equations and then you come to do this and it's like I have to rearrange equations oh my goodness! The calculator even, was a struggle* (Frances-interview1).

For Julie it was about a lack of experience in writing assignments:

> *…even just like referencing and stuff, that was something we never really had to do much. In Biomed we didn't have assignments it was all assessments, so I'd never done these assignment essay style questions* (Julie-interview1).

Dennis recognised the affect his lack of work experience had on his ability to interact on the placement:

> *…when I go on placement that is a bit difficult for me because I've never worked before. I've worked a little bit, I worked for a month in a hospital before and in other voluntary organisations like dog rescue….I think other people who have worked before, or mature students, find it a lot easier to interact with patients and with other staff. Being in the working environment for me is quite hard. So I think I have to work towards that…so I just have to gain experience basically* (Dennis-interview1).

On the other hand Darryl was a mature student with work experience, which he felt helped him communicate effectively on the placement:

> *I definitely don't think I'd have been able to do placement without working full-time…I know it is just a retail business, but all these companies strive for customer quality and customer care…so I think it helped learning how to deal with the most difficult kind of people at work over such menial little things, to sort of develop the way the way that I can speak to patients and be happy and nice around them and try to make the experience better for them* (Darryl-interview1).

These comments demonstrate the range of knowledge, skills and experiences that the students brought to the course (appendix 3). Although the students were in Year Two, many of them still perceived their previous experience, or lack of it, with topics or tasks, to be partly responsible for the difficulties they were experiencing. There were still gaps in their knowledge and partial understanding of concepts which continued to create challenges and feelings of uncertainty. For example some students had specific challenges with the mathematical elements[8]. Darryl found it difficult to follow the steps involved in rearranging equations and was aware that stages in the process were missing in his understanding. He wanted to understand these steps and how they fitted together:

> *It took a while to get my head round it because I specifically like, I don't like to accept something is the way it is, because it is. I want to know what and literally understand it. So I had a few friends who were trying to teach me how to work these equations and they were getting really irate with me because I'd ask why at every single step. Why has that happened?* (Darryl-interview1).

[8] For example logs are a mathematical concept used in the AHP course to describe the behaviour of x-rays. Mathematical equations are also used to describe a number of physical concepts.

Liesje was confident at getting the numerical answer when solving an equation, as she had experience of working with figures in her paid work, but like Darryl she did not initially understand the steps involved:

> *I don't know how I get the answer Rachel, I'm so used to working with figures and percentages I just do them in my head and don't use a calculator. But what I have to do is that I've got the right answer and I have to put down how I got there, so I have to do the equation and rearrange all the equation. For me that's what I don't like is having to do all that side of it when I've already got the answer. I then have to say how did I get there, A = B and Y and X (laughs)* (Liesje-interview1).

Darryl and Liesje both found ways of managing the mathematical difficulties in term one by doing extra work and by asking others for help. Both felt that these strategies helped them fill in the gaps and embed their knowledge, so that they could apply it to a variety of questions and scenarios:

> *…we* [peer group] *got to a point…where there is this wall / board thing…we had drawn it all out with all the reasons why, like if something switched sides what happens and stuff like this. Until I eventually grasped an understanding and once that had cracked it was actually okay, all the rest of the equations I can do them all now and I'm actually quite pleased with that. Because when I first looked at it is was terrifying and they are just letters and numbers and to me I'd prefer if it was still words. Once we had got to that point where I understood why things were happening and could visualise it in a more realistic manner now I can do most of the equations that are coming up* (Darryl-interview1).

> *…I have to say with a lot of work over the past 7 weeks, my Father-in-law is really good at physics and maths and so is my son….So they're very good and they sat down and explained everything to me, so when you put something on one side you have to put it on the other side and divide it and all that. Now all of a sudden it's clicked, it's there.…I went into the exam and I came out and I felt so good Rachel, cos I thought I have answered every one of those questions and I've been able to do it because I've remembered it and I know how I get there* (Liesje-interview1).

Lucy2 mentioned the abstract nature of the physics concepts as a factor which contributed to her partial understanding. A friend helped her understand the concepts more fully by using practical and visual explanations:

> *It is just the way the explanations are made. He breaks the information down in a way and he'll use physical props to actually show me….This guy went and got a bicycle tyre…and he said all the atoms have a spin, so*

> *you've got to think of the tyre like an atom….So for me I actually needed to see the physical properties of what was actually happening….But his idea of using it with a tyre gave me the whole picture rather than just part of it…*(Lucy2-interview1).

Aniri also found visual and verbal strategies helped her interact with the material, understand it and make it meaningful.

> *…Reading doesn't help me to learn, I read something and it might not stick in the end, so I try to do questions, so that when I do the questions and I can't answer the questions I go back and find it out in the book I've just read, that helps me to memorise, writing questions and asking them to myself….Electromagnetism where I've struggled in physics, I go to YouTube videos, they really help visualise it, when I see how this happens they show us the experiment….I'm a visual learner….I don't quite learn it until I write and draw it myself. So I am more visualising it myself and talking to myself (laughs). It sounds really odd, but it does help. If you are speaking to yourself…especially if you are with a friend and you try to explain it to someone* (Aniri-interview1).

Aniri also drew on the support of others. She did not live close to the University, so the Facebook group was helpful for sharing resources and for feeling connected to her study community:

> *…But what I really liked, we as a course, we stayed together, we have this facebook group and we are always discussing something. Some people find a really good book online, which I went to read and that really made sense….It is amazing how many resources you can find on the internet, what you can do to help yourself to learn something and find loads of different ways that you can learn (Aniri-interview1).*

These students found strategies which developed their understanding and closed some gaps. They monitored the successful strategies and this meant that they did not remain stuck with the material for long periods of time. Efklides (2006a, p.57) suggests that if students can understand what is causing the feelings of difficulty and act on this, they may be able to improve their performance. However, this is not always the case. Louise used strategies in term one drawing on the support of others, but her knowledge remained fragile and her confidence shaky, which created anxiety before the exams:

> *I noticed that I was struggling quite a bit. I'd keep trying to go back to see lecturers, go to study groups to try to understand what it is…I used to*

> *remember every time we are getting our results, everyone has higher marks and I'll be sitting thinking, why don't I have higher marks.* (Louise-interview1).

When asked about how confident she felt, she replied:

> *…not so great, because I know every time there's going to be a different equation. Trying to remember all the equations and to put them into a certain question in the exams is going to be very hard. I don't know how I remember some of them, or how I end up working them out because it is so tricky…so I don't think I am as confident as I want to be* (Louise-interview1).

Frances found extra sessions with the lecturer helpful, but like Louise she felt her understanding was still partial and her confidence fragile before the exam:

> *The lecturer's really good. She'll do a seminar…where you go in and she goes through worked examples. And by being shown how to do it, it kind of goes in. If I was just presented with the stuff and told just to go and learn it I wouldn't be able to do that. So they are really good. They realise that a lot of us, well not a lot of us, but some of us struggle with the maths* (Frances-interview1).

When asked about confidence levels, she said:

> *With the ones* [example questions] *they've shown us but if it was doing some sort of A Level random maths where you are just presented with something. I only know how to do them because I have been shown. Occasionally I get the right answer. But it was really irritating. One of the exams we did last week, I just rearranged it wrong at the very last stage and got the wrong answer* (Frances-interview1).

Matilda accessed peer support, but the strategies she used were not enough for her to feel she was managing things:

> *I was worried about the maths so I approached the 4th year physics guys doing their Masters and there's a group of us, they're giving us tutorials, maths tutorials once a week, so I'm not sitting and just moaning about it. I'm trying to be proactive and take full advantage of what's there. It is just overwhelming* (Matilda-interview1).

This discussion demonstrates how the students' understanding developed at different rates. Even though the strategies they used were helpful, going into an

exam with a partial understanding of the concepts continued to create uncertainty and concerns. Part of managing this uncertainty was recognising which gaps they needed to close, particularly for assessments, and grappling with how deep to delve into subjects. David, for example, recognised that he did not need to understand all the concepts in detail:

> *…MRI physics is quite difficult because it is all theoretical spaces…you can't really see the effect of it, it just works. You're explained why and you kind of have to accept that. There's nothing between the person and the final image that you can look at and say oh I see how it's done this. So that was quite difficult…but as long as you know basically what they are referring to then that's fine in the exam.…It's something I'll go home and look up on Wikipedia…I'd rather go and fill in those gaps so that I've got it for the exams....But saying that I still don't know what actual proton spin means, so I didn't look that up and find out* (David-interview1).

Discussions with the lecturer helped Aniri understand where the boundaries lay and she started to accept that she did not need to go into the subject quite so deeply:

> *…she said to me you are going too deep into it, you don't need to know that much because you are going into Quantum Mechanics! (laughs) and you don't need to know that…because as a Radiographer we're dealing with all this machinery, we have to know how this works and we have to know a little bit of physics behind it, but they can't give us all the physics.... We're not learning all of and that's when we don't understand because it's with gaps… I would say it was a little bit worrying because I didn't understand it and I don't want to say really bad things (laughs), but she didn't explain to me…she just said don't go into detail, you are actually understanding it really well, but in my head it didn't make sense….So I don't know, that kind of put me at ease that the questions weren't going to be too difficult….So anyway it made a picture in my head now* (Aniri-interview1).

Alya also found the lecturer's guidance helpful and this positive experience encouraged her to ask more questions:

> *…I would go to the lecturer sometimes if I didn't really understand the concept or email her and she'd email me back right away and try to explain things…and tell me not to dwell on it too much because it is a very small part of the module, so that was what I tried doing. Giving myself an understanding so it wouldn't be just a hole that I didn't know about, or just skip over it, but try to understand the surface of it really and not go into too much depth because I didn't have enough time and would just be too*

> *hectic to work through all of that…it definitely encouraged me to reach out for help because I never really tend to do that…so I felt really encouraged and started to ask a lot more* (Alya-interview1).

Many of the students' comments show that they found it helpful to use 'others' (peers, family, lecturers and ideas from the literature) in developing their understanding. However, Lucy1 found discussing ideas with other students confused her when she was still trying to understand the concepts. At this stage she needed to take control of her own route through the material. She did however see the value of working with others to reinforce material once she had a better understanding of it:

> *…I don't think I'm very good at learning in groups of people because I get distracted or things like that….Everyone has their own different bits that they understand and I have always found that I might understand something and then somebody else will go…well it's this and it changes my view of what I might actually understand. And I think with groups you sometimes end up that there are some people that sort of dictate what you are actually learning…and it might not be what you actually want to learn. I don't mind sitting with people and doing stuff, but I have to sit there and put my headphones on and concentrate on what I want to do, not what somebody else is doing….Then I think that if you know a subject quite well then it helps your recall of it because some people are asking you, because you go oh I know that and it reinforces what you understand* (Lucy1-interview1).

David also found working alone allowed him to understand concepts better. He did however use the internet as he felt he was good at finding information:

> *I think that I find that is probably the best way for me because there are no distractions and if I get stuck on something I can figure it out myself and get from the point of not understanding to the point of understanding without someone telling me the steps in between. I think I am more likely to remember it that way…* [talking about the internet]…*it's sort of like asking someone else I suppose…I think I'm generally just good at working my way through problems like that. I don't really need to consult anyone else. Sometimes I do obviously. I'll send someone a Facebook message or something like that. But usually I'm alright on my own* (David-interview2).

Like Lucy1, David chose to engage with others' views in a way which was within his control. Although he did not know what ideas he would come across on the internet, he could choose when and how he engaged with them.

In this section the second boundary challenge discussed related to the students' need to expand their current knowledge or deepen their understanding. Where they could not make sense of the material, the boundary around their knowledge was uncertain, blurred, or felt fragile. The students' used a range of strategies to help them understand difficult concepts and processes, close gaps and connect ideas to their existing knowledge. For example, if the students did not understand how the stages in a process were connected, as with the mathematical equations, understanding these steps helped close the gaps. Efklides (2006a, p.55) found that worked mathematical examples providing an overall strategy or set of guidelines for solving the problem ('heuristic schema'), reduced students' experience of difficulty and improved performance. However, the students also had to accept that there would sometimes be gaps in their knowledge, a strategy which they used to manage the uncertainty. The students had varying degrees of difficulty with this approach. Their different knowledge backgrounds meant they wanted different levels of detail or explanation from the lecturers. In most cases once the students had a basic understanding, which allowed them to complete the assessments, they were happy to accept that they did not need to know a topic in more detail.

This chapter has discussed the students' experience of two boundary challenges around knowledge, factors influencing their difficulties, specific strategies used to manage these challenges, and tensions and feelings associated with these challenges. The next chapter explores the generic strategies the students used to manage challenge, difficulty and stuckness.

Chapter Five: Findings Part-Two
Generic Strategies for Managing Challenge, Difficulty and Stuckness: Movement in and out of Liminal Spaces

In addition to the specific strategies discussed in the previous chapter, this chapter uses the students' comments to demonstrate the mix of generic strategies used to manage challenge, difficulty and stuckness, and in particular the experience of being in liminal space. These strategies relate to the role of time and space, the management of expectations and acceptance of feelings, and the use of monitoring and reflection in change processes. A detailed discussion of the points raised in this chapter and a fuller examination of the implications for practice are included in the next chapter.

Strategies related to time and space

Creating time and space through a range of postponement strategies

The students used a range of responses to challenge, difficulty and stuckness which I have interpreted as postponement strategies. These responses connect to Savin-Baden's framework (2007, pp.12-13; 2008b, pp.80-81) of five responses to disjunction (retreat, avoidance, postponement, temporising and engagement).

One example of using a postponement strategy was when Frances decided to postpone attempts at understanding a particular concept**.** She judged that it was not crucial to what she needed to know and was not preventing her from understanding the overall topic:

> *There's a lot of physics. It is amazing, I don't know who figured all that out, but that's a lot to get your head round. I suppose there are certain aspects of that I'll never understand, like this thing called k-space[9]. I've written down and someone must have said at some point, it's the inverse of reality…how can I understand something that's not real, I just can't get that. So I'm just hoping that doesn't come up. If it does that's a few marks*

[9] k-space is a concept in Magnetic Resonance Imaging (MRI) involved in the image creation.

> *down. I can accept that I will never never understand the concept of k-space…it's a very small part…but it might be one of those things that the penny will drop at some point and I'll say ahh okay I get that now* (Frances-interview1).

Alya also added that this strategy only works if the postponement does not stop your learning from moving forward:

> *I think it depends on the subject sometimes. Sometimes I'll accept something and move on, but if I feel like it is stopping me from understanding the next step or the next concept then I have to know what it is otherwise I can't move on* (Alya-interview1).

Frances's response could look like 'avoidance', where she accepted the potential loss of exam marks, or 'retreat', where she decided not to engage with an abstract concept (Savin-Baden, 2007). In Savin-Baden's (2007) framework these responses are not about engagement and managing being in liminal space. However, Alya's point about context is important here. In this context Frances made a potentially sensible and considered decision. It is unrealistic to expect that a student will 'engage' in understanding every instance of disjunction. Each response needs to be seen in the light of their overall learning experience. Schwartzman's (2010, p.39) argument about not framing students' responses in terms of 'inadequacy / adequacy' is relevant here too. Responses which 'avoid' or 'retreat' do not need to be seen in opposition to 'engagement', but can be part of a range of strategies students are using to manage different forms of disjunction.

David and Julie applied a short-term postponement strategy when not immediately understanding lecture content in term one. They both trusted that if they put further strategies in place, their understanding would develop. Interestingly both students had studied degree courses for at least a year before joining this course. They both had experience of dealing with challenging content in lectures, a factor which influences the use of 'postponement' as a strategy for managing disjunction (Savin-Baden 2007, p.12). For example Julie commented:

> *…I think you panic a bit, you think oh god how am I going to get through these exams….I think it was a case of by the second week I was thinking*

> *like every single lecture I don't know what is going on, I don't know any of this stuff, but I think if you just kind of work with it if you can, not finding it easy, but you kind of calm yourself down and think if I do this I'll get through….Yeah of course there are still things after looking over them again I'm thinking like I don't know what that is, but for the most part it comes together….I got a text book for that case which was going into it at a more basic level, so it wasn't quite at the level that I was going to need to be at, but it kind of introduced the topic to me and just let me get like a basic like cartoon picture in my head of what they were talking about. Then I find once I've got a basic level then I can start processing and bringing in all the other information* (Julie-interview1).

With Tegan, postponing working on difficult concepts was about taking a break and returning to something with fresh eyes:

> *I kind of just leave it for a while and go back to it and sometimes it will be like oh okay I understand it now….I think when I go back I have a fresh start to it, so I might get the things that are confusing me out of my head and go at it again* (Tegan-interview1).

Alya reflected on how she postponed working on certain topics or modules in term one in order to manage overwhelming feelings:

> *I was having a really hard time coping with the amount of information that we were getting all at once and I think I found everything challenging in the very beginning. I felt really overwhelmed, I felt I couldn't get a good grasp on one thing. So then I guess I try not to let myself panic, but I felt myself heading towards that way, so I just sat down and separated everything and just started tackling one thing at a time, prioritising what I needed to do first, what our exams were going to be on and putting things that were, I guess not less important, but nothing that needed my immediate attention* (Alya-interview2).

Alya's use of postponement may be considered as a form of prioritisation and is not necessarily a response to being stuck with difficult concepts. However, Alya does claim to be in a stuck place as she feels overwhelmed and unsure how to move forward. Her postponement strategy created time to focus on certain topics, which helped her begin to navigate the liminal space.

However, some students had difficulties with the idea or act of postponing understanding concepts, or working on particular tasks. For example, postponement was not a realistic strategy for Ruby when she got stuck just before the exam. This created stress and panic:

> *If I feel like I've given it a good enough go and I'm not in the mood to carry on then I'll leave it and I'll pick it up later. But if I feel like I really need to do this, then I phone a friend that I study with and I'm like - help me…I got stuck a few days before the exam on something and then it was not a happy time…and sometimes say it hasn't been helpful, or say I don't want to bother her again as I've bothered her twice that evening or whatever and sometimes you do get quite bogged down in it and that can be a bit stressful, so I think sometimes you get stuck when you've got the time pressure and you get quite upset by it I guess?* (Ruby-interview1).

Prior to the exam Aniri postponed understanding the concept fully, instead employing a strategy of memorising basic definitions, which allowed her to control her anxiety and move on to other things:

> *I try not to memorise too much. If I'm really stuck with something I try to memorise the definitions. If something is going to come up in the exam that I've memorised and not understood, well at least I would get some marks rather than not doing it at all…that's what works for me* (Aniri-interview1).

For Jane using a postponement strategy felt uncomfortable and she was unsure about her decision. She felt she was not being an effective student by not completing formative assessments and was possibly creating more work for herself later in the year:

> *We have to be taught everything but we've not had anything marked for* [specific module], *all of it's in the third term. So it is a bit difficult. Obviously our lecturer wants work from us, but it is hard to do that when we have all these exams coming up…so knowing it is the biggest module I'm thinking like what should I be doing…I'm like am I wrong to put this to one side, but obviously knowing that the exam is months away…*(Jane-interview1).

Frances used a similar strategy, but felt that other people were probably coping better than she was:

> *…I feel like I'm under a lot of pressure just now. I feel like I'm running out of time. I mean there are certain modules that we're not getting an exam on this term, so I've just literally done no work on one module at all. I'm just hoping that when we are on placement I'm going to be able to sit and go through my notes then…but it is bad that you've got so much work that you have to completely ignore one subject, but that's what I've had to do. I'm sure other people are managing to do it, because I have other commitments I just have to* (Frances-interview1).

Postponement of this type can be viewed as a negative strategy. Because entering this type of liminal space was not an active choice for Jane and Frances, they felt a lack of control over their learning. This supports Savin-Baden's (2008b, p.82) point that 'disjunction is often a position one seems to find oneself in' and Allen's (2014, p.33) argument that being in liminal space is often a more positive experience if you have chosen to be there. Frances decided to return to the topics while she was on placement and Aniri substituted memorisation instead of understanding as a short-term strategy. Having these plans in place may have allowed them to feel in control of the situation and accept postponement as less of a negative strategy.

How students' decisions were viewed in retrospect depended on the success of the strategy. Julie felt that she had partly avoided a topic in term one, had achieved lower grades and therefore created more work for Year Three:

> *I think looking back…if I had addressed that module the way I did say Pathology and made notes from the start, it would have saved me a lot of hassle and I probably would have done a lot better…I think if someone had drummed in to me at the start of second year the importance of actually paying attention and knowing these different techniques would really help you with your project. I think I completely overlooked that….I think I probably did push it aside thinking oh I don't want to waste time on this if I want to do well on the other stuff. I think if I had actually sat down and looked at the credits….I would have actually thought day one oh actually I still need to well on this* (Julie-interview2).

Julie's retrospective account is closer to Savin-Baden's (2007, p.12) 'temporising' than 'postponement', as she described her response as one of postponing, but not making a decision about how to manage the disjunction. She suggested that she might have acted differently if she had understood the module weighting and the value of doing work on it at the time. Along with some other students Julie made judgements about using postponement as a strategy based on the timing of formative and summative assessments, i.e. how urgently she needed to study the materials and understand particular concepts. This appears to be a reasonable strategy, but students do need to be aware of how postponing tasks might affect their overall grades and future workloads.

Creating time and space for understanding and meaning making

Chapter four highlights how the complex mix of challenges and strategy use led to the students sometimes feeling frustrated about their quality of learning. The use of prioritisation and postponement strategies created time and space to focus on their learning and appeared to help manage different forms of disjunction and liminal space. However, the use of these strategies also affected the students' enjoyment of and interest in the subjects. This section explores further how having time and space to consolidate material was important for the students in the process of understanding and meaning making. It also discusses whether students used an awareness of this fact as a potential strategy for managing disjunction and liminal spaces. This is a complex issue and raises questions about what the students' meant by 'knowing' something: was this about 'memorising' or 'understanding' and how did they interpret those concepts?

For Matilda, the pressure created by revising large amounts of material for the exam meant that she felt she was unable to learn things properly, compared to how she had worked in Year One:

> *…I will go into cram mode…so I'm going to pick out three things and try to learn those things. I'm not very good at doing bits and pieces in a day. I have to just absorb myself in something in a day. I'll just try to write them in points and remember stuff. But to me that doesn't feel like proper learning, cos I don't necessarily fully understand what I'm doing. I'm learning phrases and words that fit you know what might come up, so that's kind of frustrating* (Matilda-interview1).

When asked what felt like 'proper' learning, she described wanting to immerse herself in a topic so that the knowledge stayed with her. She appeared to equate understanding with remembering something over the longer term:

> *Well like fully understanding something like the stroke pathway…so I ended up doing like a flow chart thing. I read it, I went on the website links for the NHS and did it all. I really understand that now, but it took me about probably 4 or 5 hours to do it and to type it all up and to get it the way I wanted it. Then I shared it with my friends in our study group. So that to me felt like I'd learnt that properly and I can remember that now. So if that comes up today in an exam I'd probably get 20 marks or 18 marks on that because I can remember it. So it's about absorbing yourself in it and fully*

> *understanding the steps and what's going on…I haven't got the time to spend that amount of time on one topic* (Matilda-interview1).

Aniri also had concerns about how revising for exams and the time constraints affected her ability to be creative with her study methods. However, she still incorporated some creative study activity into her free time. It is interesting that she distinguished between 'pressured revision' and 'relaxed learning'.

> *There's not always enough time to be creative, because we have to learn a lot of detail and sometimes we just stick with the reading and writing. Sometimes even in my free time when I try to do YouTube videos, maybe I'm eating my lunch or something. I'm in the relaxed position, I'm watching something, whether I'm going to remember it or not, I'm making myself watch it. Or I don't know, writing flashcards and maybe I read one a day or something. I'm not actually revising, but I'm looking up little things, but I'm doing it in a relaxed state, not stressed and that makes me learn* (Aniri-interview1).

By term three Aniri was recognising a connection between depth, understanding and interest, but felt that learning in this deeper way was incompatible with covering enough material:

> *…When I don't understand something I just want to read this and if I am in a rush memorise it, but it will be gone because I have just memorised it. When I understand something it makes it interest me more because I understand how it works, I can explain that and it sticks in my mind. So I think I kind of need to make myself, if I don't understand the topic, even if it doesn't interest me at all, I need to go into depth, then I kind of make some understanding about this topic and then it starts to interest me…it is difficult yeah. Sometimes you already find something and think oh that is really interesting, but again you need to make yourself stop, but that is not the only one you are learning, which again is difficult. It is a really really powerful self-control that you have (laughs)* (Aniri-interview2).

For Dennis not consolidating material meant he might not perform well in the exam which created uncomfortable feelings:

> *The amount of information is the reason for all the pressure, struggling, overwhelming feelings I'm having. I am comfortable learning hard things with enough time, but not learning lots of things in short time. Although I can understand the new concepts and content, I don't have enough time to revise and consolidate them, and I am not good at cramping things in memory before the exams* (Dennis email1).

Jane felt that she needed to make time to consolidate her understanding in preparation for the placement. She was also balancing the desire for in-depth study with the need to cover enough material to pass the exam:

> *…I'm wondering am I able to remember what they've taught me. You know I'm saying that after the exam I forget about it, which is maybe what happened in my assessments. I'm wondering if I'm not taking it to the placement and remembering things like that – if that make sense?....I need to go through the lecture, make my own notes for it, read through it, then do the questions. That's when I will understand it really well at that point, but it takes me quite a while….I need to pass my exams but I think in the summer…I need to go back through some things and actually understand it, not be pressurised for the exam* (Jane-interview2).

Similarly for Louise, understanding was important for her professional responsibility and patient safety:

> *…We've been taught to say that if you cannot mention the specific pathology when you are working in a multidisciplinary team then how will the next person understand?...So you have to know what you are doing, know what is happening in order to make sure that the patient is going to be alright at the end of it, so one wrong step could be fatal for the patient* (Louise-interview1).

By the end of the year she explained her view on the differences between memorising and understanding:

> *What I have learnt is the difference between understanding, remembering and applying it….So if you are remembering…some people can remember it just for that exam, or saying I need to remember that for next week…so there is memory and there is actual understanding. Understanding in a way that if somebody was to walk up to me now and say I have no idea what an MRI scan is, can you please tell me what that weird banging noise is? And why they put something so close to my chest and why they strap me in and why they ask me to stay still and is there any radiation involved, am I at risk? It is things like that. So if I am able to explain all of that it means that I have learnt it, I understand it and I can say the information to someone else in a way that they will also understand it. If I was asked a question in an exam, it means I understand it and I can apply it any way and I can answer what has been asked rather than just saying things that I've remembered* (Louise-interview2).

While writing assignments, Darryl and Lucy1 created spaces for understanding, although problems were associated with these strategies:

> *My method is the worst method for getting decent marks….I will read books and I will browse the internet and I'll go out of my way to learn it and get an understanding of it and then I'll turn to it and I'll have forgotten everywhere where I read and everywhere I looked. I'll make sure I understand a certain topic first. So if someone on the street asked me this I'd could recite it all to them….I've never been one for being able to reference very well. Because I can write an entire assignment off the top of my head. Then when it comes to referencing I have to go on the internet and find references that support what I've said*…(Darryl-interview1).

Lucy1 underestimated the time she needed for an assignment task, but decided to make time to understand the material and hand it in late:

> *…I went to see the lecturer the next day and just said just so you know, I probably didn't give myself enough time, it took longer than I thought, I'm not going to be handing it in. I'd rather hand it in and still put a good amount of effort into it, rather than try to rush it and it be a poor effort…although I got penalised for handing it in late, but I got a better understanding than I would have got just trying to rush through it and not think about what I'm doing and be tired*…(Lucy1-interview1).

Both Darryl and Lucy1 prioritised making time to understand over gaining a good grade. Lucy1 took this risk in Year One, but did not want to be in the same situation in Year Two when the grade counted towards her final degree. Darryl seemed prepared to continue with this strategy. These students, particularly Darryl, took a risk and created learning space within the structures of the course. This may partly be because they felt they had more control over the assignment process than with exam schedules. However, not all students would feel confident about acting in this way. Both Darryl and Lucy1 were mature students which may have contributed to their agency in this situation, as Lucy1's comment to herself suggests:

> *…You are there now, there is nothing you can do about it, you're an adult, they're not going to shout at you, you have to deal with it* (Lucy1-interview1).

Creating spaces over time (making connections, understanding and meaning making)

Using the work placement as an example, this section illustrates how some of the students used this learning space as a strategy to consolidate understanding and manage the feelings associated with liminal space in term one. For others, it was a learning experience in term two, which on reflection then became a way of thinking and a potential new strategy for managing challenges and liminal space. I also discuss how making connections (between theory and practice and between different topic areas) played a role in helping the students manage their difficulties.

Louise found the year one placement helpful. She therefore thought ahead to the second term placement in order to manage difficulties with remembering material in term one:

> *I'm struggling with Pathology. I think the only way I've remembered the ones that I know right now is from placement….If there wasn't placement and looking at request cards that say this patient has consolidation in their lungs, or they need a chest x-ray, then I probably wouldn't be associating consolidation with chest and with something in the lungs. So I think when I go on placement again I will probably get really high marks on the exam in the third term* (Louise-interview1).

In term three she followed this strategy using the support of radiographers on placement to increase her understanding:

> *So I knew I was struggling with MRI and I was told that it was always best to ask the radiographers who are working in there….I tried to get as many different people to try to explain how the machine works, so that I can see which ones are much more easy to understand. I wrote all my notes and put them together and this is then what I need to revise. So based on that and then looking at books as well to help me read. I will just see how the exam goes after that* (Louise-interview2).

Alya was also looking ahead to the second term placement and using this knowledge to manage her partial understanding in term one:

> *I've definitely consolidated things and I've really learned it at placement….I think we'll get more MRI time as second years, so that will definitely help,*

> *once we are there and actually see it in person. It is different when someone on the job is actually explaining it to you cos it is nice getting it from different people, people explain things in different ways, people learn things in different ways* (Alya-interview1).

For Aniri, knowing that her understanding would deepen through the placement experience helped her manage the difficulties with understanding in term one:

> *…In the beginning you learn this. You don't see it and you don't know how it works. But you kind of need to make yourself go through it and you need to keep going until you get to the placement. Then on the placement that is when you realise, not with everything, but with some points you think oh I understand why I learnt that because I can see it now here. That makes a lot of sense. I think the kind of sandwich course really helps to go from the academic side to the practical side. That helps to connect the knowledge. I'm not saying everything, but it does help. That's how I manage* (Aniri-interview2).

Reflecting on the year, Julie had changed her view about how her understanding took time to develop. Like Aniri, she was now seeing this way of thinking as a strategy for managing challenges associated with not understanding difficult concepts:

> *…I think I found when I came back to it over placement and again when you come back finally for the exams, the more you look into it, the more it was like oh it kind of clicks and it made a lot more sense I think. I found that was a strategy I never had before whereas I used to be one of these people who'd like spend loads of time and just be like oh I can't give up, I'll keep trying it has to make sense. But I've now found that if I leave it and go away and come back and it might make a bit more sense…I've found it actually stays with me better* (Julie-interview2).

However, there were also instances where the placement did not help students consolidate their knowledge. For example, Darryl told me that not using mathematical elements for three months on the placement meant that he found it difficult to return to these topics in term three:

> *I think it was because like I said with Pathology, that door opened and that took over in my mind and over placement I paid attention to things I was seeing and I could continue learning that. Clinical* [modules] *again I could continue learning for them on placement. But you can't really learn maths on placement* (Darryl-interview2).

Students recognising that understanding increased over time involved them being able to make connections between theory and practice. For example, by the third term Dennis could see the value of learning so much content in term one:

> *It is really different seeing it retrospectively. What I see now is that it is worth it to learn all those modules in such urgency before the placement, because I do realise that everything that we tried to cram in from September to December is really useful and they can be applied on our placement….But I guess in December I was so stressed, all I thought was oh there is so much information that we have to take in for our placement, but it is really worth it* (Dennis-interview2).

In his year two placement Dennis focused more on the big picture and less on details. His increased understanding gave him the confidence to engage more. Making connections between theory and practice meant he saw his learning in an integrated way which made it more interesting:

> *…I have no experience of working in a hospital….In my first placement…I'm worrying more about my practical exam, so worrying about my own boxes, learning about how to do all the standard x-rays, that was my main concern, filling in all the documents….But in my second year, I already had the basis of all that…so I start to think about broader things and ways of thinking. If I can see all the links between the different departments and I start to ask more questions. Yeah I think when I learn more, then I know better what sort of questions I should ask. Then I get better information and more relevant information on my practice….So when I come back and flip through the lectures and I realised oh the lectures mentioned that. But that wasn't going into my mind before the placement because I didn't see it and it didn't stand out to me. There is a lot of different examples like that, where in practice then some of my memory from the lectures flash back and it all collaborates together and that's when my study becomes more interesting* (Dennis-interview2).

In contrast Lucy1 found it more difficult to make connections between theory and practice partly due to the separation she felt between the lectures and the placement:

> *…You know I want to know if that is broken or not broken, those sort of things rather than about how RNA and DNA works. Which now this week we've had* [the lecturer] *saying x-rays interact with the DNA, a bit more of the Radiotherapy side of things. But I find what we do here is completely separate to what we do on placement…I would rather it wasn't clear and*

> *separate. I would rather I could look at it and go oh yes I understand why I'm learning that*…(Lucy1-interview2).

Working in a busy hospital where radiographers may not always have time to share information also meant that it was challenging for Lucy1 to make connections:

> *I didn't have lots of time. It would have been nice maybe for someone to explain or say something and I actually go okay I get that, I understand that….But to be honest they are that busy as well, that in the end you just sort of get a patient off, change whatever needs to change, put new blue roll on and get help that way rather than sort of sit there. You did have a bit more time* [with MRI scans] *to chat about things because the imaging is longer, so you have a bit more time to ask questions and you did see some really good stuff that they did. But nobody went in to putting the theory into practice* (Lucy1-interview2).

As well as making connections between theory and practice, it also takes time to make connections between different parts of the content. For example seeing where overlaps exist, or how understanding one concept might support the learning of another. In term one Darryl and Louise used information management strategies to organise and simplify the material. For example Darryl's note-making strategy used Latin terms for diseases to group information together. This helped him see connections within the content so it appeared to shrink in size:

> *It's definitely that cracking the Latin. So if 'Haem' is in the word at all, we know it has something to do with the blood. So like on placement… someone said the patient has got haematuria…I could pick up that it was something to do with the blood and 'uria' I thought it is something to do with the urinary system - and it is blood in the urine…it was like it opened a door in my head…because now I've got that understanding everything since then sort of fell into place and everything started to interlink…. Pathology back then was impossible. Pathology is now something I feel I've got under my belt*…(Darryl-interview2).

After the first in-class tests Louise talked to her lecturer and devised a diagrammatic way of connecting up large amounts of information. She told me that condensing it into a manageable visual story enabled her to do better in the exam at the end of term one:

I managed to ask one of the tutors what to do when I'm trying to revise things like pathology because they throw at you lots of diseases, illnesses, symptoms. So I started to just draw up a person and say this person has this specific disease….I was able to draw up a massive map which links in most of the illnesses….When we had this meeting [in term one] *it was when we were having the first in-class tests. It was the second ones that I managed to do better on….It was trying to break down the large amount of information that was thrown at us. Yes it helped a lot. It is still helping (Louise-interview2).*

In term one Julie began to see links between subjects which helped close some of the gaps in her knowledge. This was partly about the order in which concepts were being taught:

…But I do think this year you can really see that all the modules are interconnecting…so we had already started the MRI, but we didn't know the basics behind it, so it was even more difficult to make sense of it. After a few weeks when we had done the lectures on magnetism and theories and stuff, it was now like oh that makes sense now and I know what they were talking about in that module (Julie-interview1).

For Dennis this was also about understanding the purpose of the exams and moving on from a process of learning detailed information to seeing a bigger picture:

I was studying everything last time in December. But after the placement and during the placement I start to look through the lectures quickly to have a glimpse of the overall content. I also realised that the final exam, the questions are set in a different style. Because in the mid-term exams the lecturers want us to gain maybe more technical knowledge, but in the final exam it is more about comparing and contrasting and evaluating, pulling different information from different lectures, maybe even cross module questions. That makes me realise that rather than drilling on to everything, remember all the notes, I'd rather have a better overview of different modalities. So when it comes to evaluating and thinking, then I've got a better idea of what is going on overall. I start to see a bigger picture rather than just parts of it? (Dennis-interview2).

However, Alya's comment illustrates the potential confusion students can face in understanding how the assessments might support this process.

In the first term we've got those two in-class tests they focus on a lot of depth, a lot of technical aspects and a lot of detail in the exams. I struggled with that…I failed one of the exams and it was a bit shock. So for myself I went into it with the bigger picture idea and I didn't do very

> *well. But once I'd finally worked that out that you need the detail, it was too late because it was after the exams. So going into third term, now I know the detail because I've done it and I've studied it three times over now and I've got to placement and I've actually experienced the subject…again I need to now stop going into the detail because it's not what I need for this exam. I need to look at everything and look at the broader picture again*…(Alya-interview2).

This is a complex situation where students are being guided, by the course structure or assessments, through the stage of understanding detailed subject knowledge towards being able to see a broader picture and evaluate situations. This process aligns with learning theories such as scaffolding (Bruner 1978; Vygotsky 1978) and Bloom's (1956) taxonomy. Clearly not all concepts can be taught exactly at the time students need them and the discussion illustrates how teaching often happens in a linear way and learning may not. The next chapter discusses further the importance of students making connections within their learning process and the implications for practice.

Strategies for managing expectations and accepting feelings

Uncertainty is associated with being in liminal space (Meyer and Land 2006, p.22). Bar-Anan *et al.* (2009, p.123) define uncertainty as having an 'information component (a deficit in knowledge) and a subjective component (a feeling of not knowing)'. This section illustrates the relationship between the students' expectations, feelings such as confidence, and the uncertainty of being in liminal space. It also discusses strategies used by the students to manage these expectations and feelings and therefore navigate a route through their difficulties and stuckness.

In term one Matilda's confidence was fragile. She had experience in time management with a family and paid work, but she was questioning why she could not manage her workload. Feeling overwhelmed made it difficult for Matilda to focus and make effective use of her study time:

> …*I'm thinking oh it can't be that hard, you've just got to manage your time. I was an office manager for years, I can manage my time. I print off outlook calendars…cos I work part-time and I'm a single parent…and then I've got this time for studying and I've got that time for studying. So I couldn't be more organised in that way. But what's happening now which is kind of frustrating me is that when I get to the study time I'm so tired and*

> *I feel so overwhelmed by the amount of stuff that I've got to do, that I can spend an hour of a three hour slot thinking I don't know what to do, I don't know where to start…and that's really annoying…*(Matilda-interview1).

Matilda's experience contrasts with Efklides (2006a, p.62) findings that students who have experience of a situation usually have a lower feeling of difficulty and higher confidence. Matilda did draw on her skills and experience to manage these difficulties, but she was in a new context where a particular factor, her expectations, was influencing her judgement about her performance. Efklides (2006a, p.63) mentions that satisfaction with performance is related to confidence, which can be dependent on certain standards and personal in nature. Matilda explained:

> *…It feels different because for most of my 30s I wanted to do this and there was never a right time, my son was too young and I was on my own, I couldn't do it financially. Then I did it. Everyone, my friends and my work colleagues were like oh it's amazing and they are very supportive. And my family are very supportive. But it matters so much to me that I do well. That is who I am, I do put too much pressure on myself and I always have done. So yes I recognise that I want to do the very best that I can do. If I get less than a 2.1 I'll be mortified….That's ridiculous actually because when you're out on placement…they are all the things, the work skills that I've already got, because I've worked with the public my whole life. But in my mind academically I want to do well. If I want to do a Masters, then I'd love the NHS to fund it, so I kind of need to get a high 2.1 or a first for that to happen, so it matters, it matters more. I can't explain it any better than that* (Matilda-interview1).

Part of the pressure for Matilda was that she had other responsibilities to manage alongside her studies. She had made sacrifices to come into HE and felt this was her one chance to do well for herself and for her family and friends who were supporting her. The expectations she set for herself were understandably very high:

> *Honestly I contemplated leaving at the beginning of this week. I was just so overwhelmed by it. I can't do it anymore. I'm not doing anything well. I don't feel I'm being a good Mum. I don't feel like doing my job very well. I don't feel like I'm being a very good student and I'm just really overwhelmed by it….But then if I sit and think about it and I think about the placement and how much I love that and the job and then I think about how unhappy I was in my previous job although it was very secure and well paid, it made me unhappy. So I left for a reason and this is what I've always wanted to do. So I kind of propel myself through it with that, so*

that's where I'm at, at the minute. I'm more accepting…(Matilda-interview1).

Both extracts illustrate how Matilda moved between being immersed in confusion and feeling more confident. Her conversation with herself appeared to be a way of stepping back and seeing the bigger picture in relation to her long-term goals. By acknowledging her love of the job and the opportunities she had on placement to demonstrate her skills, she gained a different perspective on her expectations, built her confidence and was motivated to continue.
Dennis also recognised that he needed to adjust his expectations in order to manage the stress. Although he found it difficult, he tried drawing some boundaries around what he was learning and the time he spent doing this:

I think that I'm not very good at giving up. If I have to stay through the night I will. It's not very good, but sometimes I do. Yes I do want to be a bit tolerant and a little bit rough to myself, just push myself, maybe because I expect a bit more from myself….Sometimes I'm surprised at what I did, if I look through the week and look through the notes I've made….Sometimes the stress gets to me. When I am so stressed I get a little bit grumpy and a little bit low, but I try to stay positive all the time. I think knowing my limit is the best way to stay positive because over the years especially at Uni I learn to give up. Sometimes I just say to myself I can't do it, let's do something simpler, or let's cut out something and yes that helps me a bit, learn to give up! (Dennis-interview1).

Both Julie and Aniri mentioned the impact lecturers had on their expectations and how they approached their studies. Julie generally felt that it was helpful for lecturers to mention that the year was going to be difficult since this made her focus:

…I think second year was where all the really important stuff was thrown at you…so I think in that sense it's tough, but it's definitely doable. I think people almost scare you off telling you how hard it's going to be. If you go in with the right attitude and manage your time its fine….I think in way it was kind of like oh gee can you stop telling us, we get that it's going to be really tough (laughs), but at the same time you kind of think, okay this is really important, I have to go to all my lectures and I have to pay attention. You kind of are consciously making a bit more of an effort (Julie-interview2).

However, for Aniri lecturers' comments had a different impact on her expectations. She felt that her worries affected her confidence, particularly at the beginning of term one:

> *Sometime because the lecturers said it was going to be difficult I don't know, I feel when they say this, I feel that when I'm going to approach them…to ask them something that I don't understand they are going to confuse me even more. That's why I think the biggest impact for me was that they kind of said it is going to be really tough, that was just how my mind works….Maybe I think my worrying and nerves impact on the studies….When you are revising and you are reading something, you don't understand it, you go and find this and you still don't find anything or information. Then you know it is hard because you have been told that it's going be difficult, then you go and find some more information and that makes more sense….I am just saying it is kind of slowly working through it and just being less stressful about it I think. It was stressful though, especially when they say it is going to be so tough, then they say some people dropped out from this course…that really make a huge impact on your mind. How lecturers speak to you I think it has a huge impact on how you are going to work, the mind is a powerful thing* (Aniri-interview1).

Aniri is taking time to work through the challenges and difficulties, but the fact that she is being told that this is difficult is making her question her own study processes. She also worried about asking the lecturers in case they confused her more, so during the early stages of learning, when understanding was partial and confidence fragile, more confusion was a real fear. Reflecting in term three, Aniri offered useful advice on how educators might strike this difficult balance. She also illustrates the point that moving through liminal space might be a 'normal' part of education and that reassurance about this can be helpful in managing the process:

> *…I think if they said something like you will get through it, you know not just to scare us. If they say, it is just normal, like a new topic, it is manageable, that is what I think….Maybe say it is difficult, but you can find this information there and there, kind of guide you….From one point of view it is good cos they prepare you, so you're not relaxed, but on the other hand you worry and if you worry you make it worse* (Aniri-interview2).

She also reflected on the changes she would make as a result of this experience:

> *…not worrying too much…so I think confidence, that's what really pulled me down. Because lecturers have a powerful impact on us as well. So I think no matter what they are going to say, just keep confident, keep saying yes I will do this, no matter how difficult it will be* (Aniri-interview2).

Students like Ruby were involved in complex cycles of feelings, one moment feeling confident the next moment unsure and worried:

> *I can get myself in a bit of a muddle sometimes…I feel I can get stressed if I don't understand something and I've been trying for a while to understand and then I'm like oh I don't understand anything, I know nothing!... But an hour later I'm like oh come on we can do it….Often I'm thinking like come on it's not too hard it's something to do with me. I'm sure sometimes when it has been quite tricky it is one of those things. But I definitely I feel like it's more my understanding as opposed to their explaining…cos often if I'm stuck I'm like well I haven't really done that properly have we, let's go back over. I guess I tend to get there in the end, but it is a bit of a struggle in that sense*…(Ruby-interview1).

Alya's confidence was affected because she felt she was running out of strategies. She told me she was in a study group; she had asked third year students for advice; she had tried to balance her time between various modules; but still she felt overwhelmed. At this point Alya appeared to be in a 'cycle of stuckness' (Savin-Baden 2008a, p.105):

> *Just the fact that it was all new information and there was a lot of information in a very short amount of time. Trying to balance everything out…it is just really difficult to just study one thing in depth because the next day you have a lecture on it anyway, like you have a lecture on the next subject and then the next subject. I felt really really overwhelmed, even though I was trying to keep on top of things I felt like I was doing everything in my power to do so, but I couldn't anyway. That's where you feel like, I don't know, really overwhelmed and you feel like I don't know what else I can do, I'm doing everything I can but it's still not good enough* (Alya-interview1).

Alya described how she moved through this liminal space to a place where she felt more confident:

> *I guess I give myself some time to freak out and panic and I can't do that forever. I have just to make a plan because I'm not going to fail. I have to figure it out somehow. So I just try to sit with myself. This is what I'm going to do, I'm going to do this and this and see if that works….I have my moments of panic anyway during the plan, or if the plan goes wrong, or if the plan isn't working. I have a lot of little breakdowns here and there and*

> *trying to figure things out and if things aren't working the way I want them to, so that was not a great feeling. I did have my desperate moments every now and then. I try to pull myself out of them or my friends try to pull me out of them or family did or whatever. But yeah that was the difficult part of it, trying to remember it, emotionally* (Alya-interview1).

Alya recognised that things were difficult but she wanted to move on from the stuckness. This is evidence of Schwartzman's (2010, p.39) 'will to authenticity' where students want to tackle the problem despite their feelings of anxiety. Schwartzman (2010, p.39) also suggests that if educators understand what motivates individuals in these situations, this can be used to support other students. Despite feeling worried, Alya trusted that she would find a way through the liminal space and could visualise the end point where she had passed the module. Part of this trust may have stemmed from the fact that she had been through similar difficulties in school. She was able to implement a strategy of planning and thinking through what she needed to do.

> *I remember being under a lot of pressure when I was in high school. I was taking on a lot more than I could actually…I was going back to that, but I hadn't dealt with that kind of pressure in a couple of years. So I was thinking to myself. I've been in a similar situation, maybe not as important. Because its university now and I can't fail. So I was thinking okay eventually I'm going to get through this and I'm going to figure it out, so I already know the end, I know I'm going to pass, I know I'm going to do this so I just have to get myself from here to there, and I felt like that was how I pulled myself out of that, that almost like depression that I was slowly getting in to* (Alya-interview1).

Liesje's previous experiences also shaped how she managed difficulties in term one. Like Alya she had a desire to tackle the difficulties in some way. Both used a strategy of giving themselves a 'pep talk' or verbalising their ideas as a form of motivation and to reinforce the belief that they would move on from this stuck place. They recognised that moving forward involved taking a series of small steps. The dialogue with themselves allowed them to identify these steps and possibly created a sense of control over the process and their learning:

> *…You know in all the jobs I've done I've won various different awards because I'm very motivated and I like challenges. I like learning new things, so I always think it's not going to beat me (laughs) whatever I've got to face I've got to face it. But I have to say for the Science part in those very first weeks I did think I don't think this is for me…so I might go a little*

bit down, but not for long, because I wouldn't let it get to that stage because I'd have to walk away. So I just think I can do this…it's not going to beat me I am going to do this degree….So then I think be positive Liesje, work out what you are going to do, plan it….You need to be there, how are you going to get there?...Yes I talk to myself and I say no you can do it…do it step by step kind of and you are going to get there….So I think it is maybe something that I've learnt, but I also like to think that it is a little bit part of my character as well (Liesje-interview1).

One of Alya's other strategies for staying positive was to celebrate her 'small' successes:

…So I guess I do try to keep a positive mind-set and pull everyone into that positivity with me because it so easy to just fall into the crowd's negativity…and yes a lot of things were horrible, but then again I tried to celebrate a little bit in that oh I've finally got through this subject and I've finally come to a conclusion and I'm so glad I understand it now. So I tried to celebrate my little victories. Another victory is when I can explain to someone else and it pulls them out of their negativity and they understand it too, so that is even better. That helped me I guess. Finding the little things that kept me positive throughout this term (Alya-interview1).

The role others played in developing the students' understanding has already been highlighted. Here Matilda and Liesje drew on their connections with other people for support in managing the feelings associated with being in liminal space:

…I've got lots of friends, I'm really fortunate and I have been really down and I didn't come in on Monday and Tuesday because I was trying to work through my head and thinking I don't know if I can do this. Thinking through my options, what am I going to do? And six lovely people who I spend time with were texting me and four of them just turned up at my house too and were like you're not going anywhere…(Matilda-interview1).

…we have all said that we got each other through it….The three of us we met up for the last exams and had our study group and we got each other through it. So yes determination, but having friends like that who you can get through things with, we've really supported each other (Liesje-interview2).

For Matilda talking to a lecturer was also important, though she still felt disappointed with her performance and the learning experience:

Yeah and I did go and see her and she was fantastic. I have thanked her and I will tell her at the end, how she did stop me from leaving. She said

look at the bigger picture. Do you still want to do the job, well yes I do, well then don't leave the degree because it's tough you know cos you'll regret it….She said doing the best you can doesn't mean spending every minute every day studying, it means spending every minute you've got free, doing what you can do. She said you've got other commitments….That kind of changed how I thought about things really. So I was okay, I have to do these other things I can't not do them….I then just learnt stuff by rote literally….I'm like well I passed and that's kind of it, that's where it's at….I think I just feel disappointed….But I suppose I feel disappointed because I can see it highly unlikely that I will get a first now, so I've had to let that go. So that is difficult (Matilda-interview2).

These extracts demonstrate how difficulties and feeling stuck can affect confidence levels. The students questioned their ability to study at this level, their study strategies and their likelihood of passing the assessments and the course. At the same time they demonstrated creativity and resourcefulness, using a range of strategies to manage the disjunction and navigate their way through liminal space. The complexity of this situation is explored further in the next chapter.

Change over time: strategies related to monitoring, reflection and understanding own study strategies

The previous section demonstrated that students often questioned their study strategies, particularly when their confidence was low. This section explores examples where the students changed their study methods during the year and how changes occurred in their view of themselves as learners. It also discusses the role of monitoring and reflection in the change process and how these strategies might help with managing difficulties and being in liminal space.

In term one, David and Matilda were aware of some of their strengths and weaknesses in relation to studying. This may have partly influenced their choice of study strategies and in trialling changes over the year. For example David's trust in his problem-solving strategy allowed him to complete assignments in a short space of time. He recognised this was a risky strategy and felt uncomfortable about the process (it is not the study advice often given to students). However, his experience of this strategy working for both his motivation and grades meant that he was likely to continue taking this calculated risk.

Talking about doing his first literature review in term one:

> *It's something I haven't done before. I've got the time planned, but I might sit down and run into it and realise that I have absolutely no idea what I'm doing, or maybe I don't have the skills to analyse the literature or whatever. It is just the panicky stuff I'm doing before I start. But I'm not that worried, I'm sure I'll get through it. I was worried in exactly the same way about the case study that we did last year and I passed that, not brilliantly, but fairly well* (David-interview1).

Reflecting on this process in term three:

> *…I think I'm just generally good at understanding what's required out of an essay. If I can read the question I can see what they are going for straight away and I'm quite good at figuring out what I need to look for and how I need to structure it….I think the issue is that I have trouble motivating myself to do work when there isn't a deadline coming up. I think I need something that solid. Once I'm going it is fine and I can do quite a lot of work in quite a short space of time, but only if there is something on the line. It's not a very healthy attitude is it?* (David-interview2).

However, David did question whether he should start his revision process earlier:

> *I'm going to try to start earlier and do less revision per day over a longer stretch of days, because my exam revision technique like I say is generally to do it a few days before the exam and I end up having to pack quite a lot in which…it works, but I don't know if doing it the other way would work better. I imagine it would probably work better if I gave myself more frequent breaks, but maybe it wouldn't?* (David-interview1).

By the end of the year he had tried this and made some changes:

> *…What ended up happening was in the early days I'd do a bit of revision, but probably not as much as I could have done….Then as I got closer to the exams it took up more of a proportion of the time, which I think is fairly a good way of doing things. You ease yourself in rather than slamming yourself with work from day one. So that worked out quite well* (David-interview2).

From the start of the year Matilda trusted her ability and strategies for completing assignments:

> *I had confidence in it. It doesn't scare me….I remember getting the first essay I got here. I thought I don't even understand what those words mean cos it was a physics essay. But actually I thought I don't need to fully understand that because I will by the end of the essay. I just need to pick out what are they asking me? What's the question? They want to know how that is linked to that and how you get to that....If I really struggled I'd do a paragraph on one bit and do a paragraph on the next bit, then a paragraph on the third bit and then bring it all together at the end* (Matilda-interview2).

By term three she had changed her revision techniques and felt more confident about her exam performance:

> *…My first exam was Pathology and I went in and I was so calm. I was just like, you know what I've studied hard for it. I did different stuff this time. I studied like a normally do, I write, I have to write everything down and I have to speak it and then I did flash cards. Then my son said to write the question about what the answer is on the flashcard so you can test yourself. So I have a couple of key words on one side and then I'd have to tell myself out loud what was on the other side and flip it over and see what was on the other side, to make sure I got it right. I also recorded some stuff and listened to that on my ipod, just to try and absorb it. So I don't know if I've done better. I felt better* (Matilda-interview2).

Alya was concerned about how writing everything down in lectures affected her ability to manage the content and understand the material. Observing her friend's strategies allowed her to change her note-making techniques:

> *One of my friends used to be a secretary, so she takes impeccable notes….She is so fast and she just writes relevant things down. So I am seeing how she goes about it and what she picks out from different topics. It is really interesting. I have tried to do the same thing and I would take notes and try to not write down everything. Some lectures I've started recording them and I'd never really thought about that, but my friend started doing it, so I thought let's see if it helps me....If I knew I had a recording I was like okay I can just listen to it and pick it up later. I didn't want to waste this time writing down one idea and miss three points that she has just said. So that definitely helped* (Alya-interview2).

Having the lecture recorded, now policy at the University, can reduce the worries students have about capturing all the content and encourage them to experiment with note-making styles. However, a recording is less helpful if students still write everything down having sat through two hours of each lecture, a point made by one of my academic colleagues. Students still need to

develop techniques for identifying key points and then supplementing notes with additional material to makes sense of the topic. Although beyond the scope of this discussion, the findings suggest that more support in developing effective note-making strategies would be useful for students.

Ruby and Gloria became more aware of the exam-revision strategies which worked for them, and which increased their confidence in managing the uncertainty associated with exams. In particular Ruby trusted her ability to work something out if she got stuck in the exam:

> *I think I make connections…I'm not someone who gets particularly panicked in exams, that one helps me quite a bit….I'm certainly one of those people that is like well I'm in here now I might as well think!…and even if I can't recall it straight away I feel like because I have a good enough understanding, sometimes I just don't know, but often I'm able to work it out because of the way I've learnt it. So say if I've jumped to an answer, I'll think about it later and be like oh maybe it couldn't be that because that is related to cardiac failure and that's not what we're looking for, so it must be something else….I am happy that if I don't know it, that I'm at least able to give it a shot*…(Ruby-interview2).

Gloria recognised that she did not need to understand everything to do well in the exam:

> *I think I probably feel more confident in myself. You know how I said someone said to me oh you can't know everything. I have just really taken that on board with everything that I do now. I can't do everything, I can't know everything. I can't run everywhere. That's probably something that has changed me, in terms of if you go into an exam and you don't feel like you know everything, it's okay, you are going to be able to answer some of the questions. Whereas before I just thought if I don't know it that's it, exam failed*…(Gloria-interview2).

Alya reflected on how she monitored her study strategies and the importance of remaining balanced in her self-criticism and self-reward:

> *I think some people can bounce that kind of thing, but not me, I have to monitor everything that is going on. And if things are going to plan and if they aren't I need to make a new plan and figure things out. If they aren't I get really just panicky, especially when there is a deadline I have to meet. I have to make sure everything is in order and everything is in order in my mind too….I think it's a balance between being my own biggest critic and also rewarding myself for doing well on something, so just a balance*

between those two. I don't want to over criticise myself, and then you know I won't feel like I'll be able to do anything, I feel useless, but I don't want to reward myself too much because then I'll feel like okay I don't need to do anything if I'm that great. So it is always a balance…(Alya-interview2).

Julie, Alya, Aniri and Dennis all felt that they had become better learners over the year. The changes they had made and were still making, came about through experience:

I think I probably learn better, looking back it probably would have taken me longer to learn things in first year. Whereas I think after second year…I don't think you realise it but you just get more into what way suits you to learn and stuff. I think I probably do get through things quicker for the most part. A lot of it may be just being new, like paying more attention in lectures in second year, just trying to keep on top of things more. You come back to them you obviously have more of an understanding. I think even just things like reading around the topics in second year, whereas in first year I found you were more just looking at your lecture notes and you're a bit lost, it's a bit more of a shock (Julie-interview2).

For Alya working more with others and asking for help was a major change in year two, which she felt improved her confidence in how she was learning:

I don't know I guess it makes me feel a little more confident, I haven't really thought about it, (pause)….Instead of being stuck in my own way I am open to the fact that other people are right too. I know I'm not right all the time. I am just seeing outside of myself and learning from other people, letting other people teach me as well as me teaching other people. That definitely helps your confidence more than anything I think. There's always a little bit of pride swallowing when you're just having to ask for help and things like that and I've never been too used to that. Just stepping outside myself and asking for help, asking lecturers, asking students, it has definitely helped me in tremendous ways….I feel very very different from first year, the way I learn, even the way I take notes and the way I do things is completely different from first year. If I knew this in first year I probably would have done slightly better….I would have guided myself in this direction (Alya-interview2).

Aniri felt she had learnt how to manage difficulties through reflecting on and understanding the strategies that worked for her:

I would say definitely my academic structure or ways that I learn, or how I learn in extreme stressful situations. I find ways, not just go and think right that's it, I'm not going to do this, I will fail, but still have the feeling that I can do this because I have this strategy….I think now I would find ways

> *out, not saying that I didn't do this in the first term. I am going to say that when I am learning something and I don't understand something, in the first term I was like, ahhh, I was panicking. This time it will be when I don't understand something, it will be maybe take a break, go back read this, go into a different topic and come back to this one. But just don't spend too much time going deeper and deeper into one topic. Maybe that is what I will do* (Aniri-interview2).

Dennis reflected on how confidence in his study methods had developed influenced by his friends and experimentation:

> *I guess maybe the way I study could have been done better and made my life easier, but it is different for different people. I realise that. I study with my friends quite a lot. They all have their own styles of study and they all take in information in different ways…I think everyone has to find their own way of studying, I believe that….For me to get to where I am studying now, is through trial and error (laughs) I guess. Yeah I think for me I have to have gone through that process….Even if someone was to say to me in the beginning of the year, try that, I wouldn't have had the confidence to try that. I think I would have just stuck to my way and then made that mistake and then had the realisation….But my friends they have given me advice, like try to do the past papers first, see all the different questions…so it changes my way of thinking during my revision and that does help. So I guess it is good to observe how other friends study and take in bits that I'd quite like to try* (Dennis-interview2).

Dennis's comments and Alya's below illustrate how knowing about strategies does not guarantee avoidance of difficulties or liminal spaces:

> *Looking back on first term I don't feel I could have done anything to change how it went. Even at the time I felt I tried my absolute best. I literally spent all my time revising….I look back on it and there was literally a fixed amount of time and this amount of things to do and you just have to squeeze it into every minute….You just have to get through it….You can try to go over your revision methods and try to improve this or fit that in. But you don't know because you are going through it at the time and you don't really have time, or too much time, or wasting time thinking about that. You just have to get through it, get your head down and make it*…(Alya-interview2).

This final section demonstrates how students' study methods and strategies changed over the year. It could be argued that a second year student will naturally study more effectively than a first year student. I agree that it is not possible to prepare students for all the challenges they might face, partly because it is difficult to predict what those challenges will be and which

strategies will work for particular students. However, the students' comments suggest that understanding their own study methods, trusting their learning processes and making strategy changes at appropriate times was helpful in managing challenges and difficulties. This process is discussed further in the next chapter.

Chapter Six:
Discussion and Conclusions - Drawing Ideas Together and Implications for Practice

This chapter draws together the findings from the previous two chapters in a discussion about the importance of knowledge boundary challenges in HE, recognising the 'spiky profile' (Cottrell 2013a; Happé and Frith 1996) and influencing factors, and acknowledging all forms of strategy use. It also discusses the role played by 'others' in strategy use and in creating challenges. The chapter closes with some reflections on liminal space and conclusions about the importance of challenge in education and the connections between challenges and strategy use.

The importance of knowledge boundary challenges

In chapter four I identified two connected challenges the students experienced. I described these as *boundary challenges,* defined as situations which create uncertainty. I focused on two boundary challenges relating to knowledge: uncertain boundaries around the breadth and depth of knowledge, and uncertain boundaries around understanding. These challenges presented two questions for the students: 'What do I learn?' and 'How do I understand concepts and processes?'

Although some of the students began by assuming that they could learn everything presented to them in a module, they quickly became aware of the difficulties and uncertainties created by attempting to draw boundaries around the breadth and depth of their knowledge. It is possible to see the students as having 'naïve epistemological beliefs' (Bromme *et al.* 2010, pp.8-9) where they had a desire to see knowledge as fixed and some students were responding in this way. However, my view is that given the context, the tensions they were experiencing could be expected. They were presented with a challenge which was to learn and be assessed on what appeared to be a boundaried set of knowledge, created by the modular structure (module outlines, learning outcomes, reading lists). At the same time as educators we were encouraging

the students to step outside these boundaries and explore their own interests. This created a situation of uncertainty and shifting boundaries.

This scenario echoes Savin-Baden's (2008a, pp.13-15) discussion about smooth and striated spaces. In principle we want the students to be in a smooth unbounded space where they are free to chart their own course through the material. In many cases the students wanted the freedom to make their own journey through the course, at their pace and using their study methods. However, in reality the structure of our courses, with varying levels of content and specific summative deadlines means that we have created a striated space where students have specific points they must get to by certain times. The summative deadlines created pressure to understand material in short time intervals. In addition, learning material for exams or assessments may not correspond with the students' interests or with what they see as relevant to their career. This striated space, which is primarily not in the control of the student, understandably created tensions and additional challenges. It may also mean that students find themselves facing some form of disjunction or in liminal space. Liminal space can therefore be seen as having smooth and striated elements.

It is not always possible to give students complete freedom to draw their own boundaries around knowledge, particularly when they are working towards professional accreditation. Such freedom would still require them to make choices about what to learn and in what depth and would not necessarily prevent them from entering liminal space. However, some students in the study managed the tensions by creating smooth spaces for themselves, focusing on topics which interested them, or through developing study resources and study spaces outside those offered within the formal curriculum. This suggests that giving students more control over their learning may increase their enjoyment and interest which then helps them manage difficulties and navigate liminal spaces. Elements of choice can be created by giving students a range of assignment topics and titles, or supporting them to develop their own titles for assessments. It may also be possible to create project-type activities early on in courses and assignments or modules where there is a more open curriculum where content can be 'meddled with' (Savin-Baden 2008a, p. 32).

The second knowledge boundary challenge related to understanding, and in particular understanding difficult concepts. Gaps in the students' knowledge and difficulties with incorporating the concepts into their frame of meaning, created uncertainty in relation to their exam performance and their effectiveness in the workplace. The timings of summative assessments also created a pressure to develop this understanding within certain timescales. Some students recognised a role for memorising elements of the content, but also showed a desire to understand concepts and topics in depth. For some students understanding in depth was a way to gain good exam grades, but it was also about being interested in the subject and recognising that the knowledge was important for their future career.

It could be argued that both these challenges are just the type students in HE should be grappling with. Savin-Baden (2008a, p.31) argues that students should be enthused to engage with questions about knowledge and boundaries' since they need to be able 'to challenge and enhance the interrelated worlds of theory and practice, as well as engage with the worlds in between'. The tensions the students experienced regarding what to learn and in what depth, support Savin-Baden's (2008b, pp.77-78) contention that difficulties arise when divisions are made between knowledge which is 'produced in the academe, separate from its use' and knowledge which is 'produced in, and validated through, the world of work'. She suggests it is important to recognise the connections between different types of knowledge and how these 'spaces' are 'managed'. The AHP course already contains activities where students can make these connections, for example using reflective logs to learn from their placement experience. The value of making connections is discussed later in this chapter.

The findings suggest that some students recognised that open and shifting boundaries exist around the breadth and depth of knowledge, and that boundaries will feel uncertain and fragile due to gaps in understanding. Savin-Baden (2008b, p.83) suggests that 'living with open boundaries' is one way to manage being in liminal space. While Savin-Baden (2008a, pp.139-140) does suggest that this position means accepting that 'life and learning' is constantly changing, she also observes that recognising our own limits and those in our

environment can be important in managing uncertainty. Accepting limits, such as the deadline for a task or assessment to be completed, means that a temporary boundary is being drawn, so it may be helpful for students to understand when and why they might need to do this. There were also examples where the knowledge being presented conflicted with a student's epistemological beliefs. It could be argued that this acted as an external limit or boundary around the content they felt they should be learning. As mentioned some students were able to find ways of negotiating these boundaries by finding space to focus on their own interests and potentially resolving some of the tensions. Managing the challenges relating to uncertain boundaries around knowledge involves encouraging students to understand how and why they are making decisions about knowledge.

Being able to make judgements about what to research, present and critique are all 'learning processes' which take time to grasp and require students to understand the disciplinary lens operating in their context. The findings suggest that students would benefit from explicit discussions about the relationship between lecture material and additional reading, how modules are structured to allow the coverage and development of particular knowledge elements, and how assessments are designed to assess different types of knowledge and evidence. As educators we can provide students with opportunities to practise and reflect on their learning processes through formative activities. For example the AHP course provides a practical session on identifying criteria for critiquing research articles. My argument here is not that we should be trying to prevent students from encountering disjunction and entering liminal space. Only that an awareness of the uncertainties for students and how factors such as levels of content and assessments interact with boundary challenges around knowledge, can help students and staff identify effective strategies and support mechanisms.

Recognising 'spiky profiles' and influencing factors

Variation in the students' experiences of challenge, difficulty and stuckness can partly be explained by the factors influencing an individual student and the interaction of these factors. The students cited several factors as contributing to

their difficulties, or in some cases the straightforwardness of their experiences. Throughout chapters four and five I have highlighted where these factors resonate with Savin-Baden's (2008a) catalysts for disjunction and Efklides' (2006a) factors influencing 'feeling of difficulty'. There are three main findings to draw from the data.

Firstly, the factors overlapped and interacted in more complex ways than I had expected. For example factors such as the volume of content in a module and pressures created by exam deadlines partly related to the teaching context, but also to how the students perceived and responded to these issues. Factors related to the nature of the subject, such as abstract concepts in physics and mathematical processes, highlighted an interaction between the teaching context, the students' pre-existing knowledge and experience, and their relationships with peers, family, staff and other professionals. There were several factors relating to individual students such as their previous study and work experience, perceptions about their specific task-related and general abilities, and their commitments outside the course, which affected how they experienced challenges. There were also factors which the students expressed less explicitly, which I interpreted as relating to their views on knowledge and learning (epistemological beliefs), their expectations, and their feelings.

Secondly, the data demonstrates the importance of understanding that students come to university with unique 'spiky profiles' (Cottrell 2013a; Happé and Frith 1996) with different strengths and weaknesses in subject knowledge, academic skills and experience with exams, written work and the workplace. The students were able to access a range of support mechanisms in Year Two. Nevertheless the evidence from my study challenges perceptions that high achieving students do not continue to experience difficulties with their academic study. An individual student may have high entry grades or good first year grades, but there can still be considerable gaps in their knowledge and experience.

Thirdly, at certain points in time, and for certain individuals, a number of factors combined to create a situation where challenges became overwhelming difficulties. An example of this would be where a student had little experience of studying mathematics, was finding it challenging to manage the content in a

module and also had work or family commitments. The interaction of these factors combined with the knowledge boundary challenges, potentially created disjunction and the conditions for the student to find themselves in liminal space. So the number of challenges and factors influencing a student concurrently was important.

An understanding of the impact and interconnectedness of these influencing factors can help students and staff identify effective strategies and support mechanisms. This has implications for current student support in HE, particularly in Year One, but also beyond this. Cottrell (2013b, p.5) argues that although there are many opportunities for HE students to engage in activities to improve their learning, the provision is often not given a high profile, perhaps because to acknowledge its existence might 'reflect poorly on an HEI's intake'. It is therefore important that staff and students work together to promote the idea that all students can benefit from improving their academic skills. As Cottrell (2013b, p.14) states, 'Good support for learning, both integrated into course delivery and through additional opportunities for individuals, can help to raise student and institutional performance'.

One way to do this is to provide regular activities which offer students guidance on and practice in developing their academic skills, with reflective activities built in. Provision in HE institutions consists of activities embedded within the curriculum or tutorial system, centrally organised workshops and individual appointments (Murray and Glass 2011). Diagnostic activities and discussions early on in an academic year can also identify students who need additional support in specific areas. Evidence from this study and other projects I have been involved in, for example with mathematical support (University internal reports 2009-16) demonstrate that timely and effective provision can be important in supporting students to navigate difficulties and liminal spaces. A review of research on mathematical support in HE concluded that accessing support contributed to 'improved performance, retention and mathematical confidence' (Matthews *et al.* 2012, p.21).

Recognising all forms of strategy use: creativity and resourcefulness

A second element in understanding the variation in student experience related to their strategy use. The type and range of strategy used, evaluation of their use, the resulting changes, and the timescales students were operating in, were all important in understanding whether students were facing disjunction and entered liminal space and how long they spent there**.** I identified two key types of strategy use.

Firstly, I am using the term 'specific' for strategies the students used to manage identified challenges, although they are not limited to managing the particular challenges discussed in chapter four. Specific strategies included working with a peer to help understand how to rearrange equations; or when managing a large amount of content, prioritising the study of a topic in more depth because you are interested in it, or believe it to be relevant to the workplace.

Secondly, although 'generic' strategies were used to manage the specific knowledge boundary challenges, they had a wider application for managing disjunction and uncertainty and for navigating liminal space. The students were using and developing generic strategies in three key areas related to the role of time and space, the management of expectations and acceptance of feelings, and the role of monitoring and reflection in change processes.

The role of time and space

Prioritisation and postponement strategies were used to manage time and create space by shifting when or whether students engaged with understanding or studying the material. This was over the short-term (a few hours), or the longer-term (a few months). This type of strategy for managing difficulties, where the 'timing' and 'sequence' of events were important, can be linked to Adam *et al*.'s (2008, pp.8-9) discussion about different elements of time. I suggested that the different forms of postponement students were using, should not be seen in opposition to engagement with challenges, but as strategies enacted in the context of time pressures. Postponement strategies allowed the students to create spaces for in-depth study, where they had time to read, research, think and discuss. Savin-Baden (2008b, p.81) recognises that her

terms (retreat, avoidance, temporising, postponement), do not always capture the ‘conflict, ambiguity and incoherence experienced by individual students’.

There were of course certain risks involved in using postponement strategies, such as entering exams with partial understanding or creating an increased workload for the future. The students differed in how they used the time created and how this helped them accept and manage uncomfortable feelings associated with difficulty and stuckness. Students only accepted postponement as a positive strategy if they had been through the experience before and achieved a positive, or at least an acceptable outcome. It also appeared to be a more effective strategy when students had a plan to do more work on the topic and had further strategies they could put in place in subsequent days or weeks. If students are going to use postponement as a strategy, it can be helpful if they reflect on how they have used this strategy in the past, as well as being made aware of how it might impact on future workloads and assessments. As Savin-Baden (2008a, pp.109-110) suggests, ‘reviewing prior experiences of learning’ (and in this case strategy use) can help manage being in liminal space.

The creation of time and space for in-depth study allowed the students to consolidate new or difficult material (a process of meaning-making). This also involved students in making connections between theory and practice and between specific concepts and topic areas. I suggest that making these types of connections is an example of Land *et al.’s* (2014a, p.4) discussion about points of ‘connectivity’, which he suggests might help navigate liminal space. Making connections helped to integrate concepts or topics, creating a shift from the stuck place to one where understanding was deepened, or a bigger picture could be seen. Carstensen and Bernhard, (2016, p.212) highlighted the importance of making links between concepts or ‘islands’, as a way of supporting HE Engineering students in moving out of liminal space.

However, studying a topic in depth did not always prevent students from entering liminal space or help them to manage it. The passage of time also allowed the students to make connections (meaning-making over time). Land *et al.* (2014a, p.7) explain that students may not ‘have all the signs, all the signifiers that they need eventually for that particular conceptual understanding

to come together'. It takes time for the pieces to fit together. I have sometimes presented material and then asked students if they understand or have questions, resulting in few responses. My intention to introduce an element of participation into the lecture context, perhaps reinforces the idea that understanding is an instant process by assuming that students would be ready to respond immediately. In this context I am reminded of Perkin's (1999) discussion on the 'active', 'social' and 'creative' elements of constructivism and a more productive route might be to encourage the students to explore and consolidate their knowledge and create other spaces for questions and discussion.

There were examples where the students recognised that understanding was not an instant process and then used this awareness to help them manage their partial understanding. For example where they felt stuck with concepts in term one, but recognised that the placement experience in term two would develop their understanding. These time-related strategies are examples of being able to 'sit with a dilemma' or 'live with tensions', ways out of liminal spaces according to Savin-Baden (2008b, p.83). Their use involves recognising that time and further study is needed, so movement out of liminal space may not happen quickly. Developing this way of thinking often comes through experience, so can take time to develop. However, it is helpful to make students aware that understanding can take time and encourage them to make connections between theory and practice and between different parts of the content as they progress through a period of study. As Land *et al*. (2014b, p.209) point out an increased awareness may help students to 'persevere' with difficulties, manage uncertainty and perhaps 'shorten that liminal period' (Land *et al*. 2014a, p.7). It also creates a climate where development over time is seen as a regular part of the learning process.

The students' comments also highlighted how teaching often happens in a linear way and their learning may not, which adds to the challenge of understanding concepts and of making connections. Although courses may be designed to scaffold students' knowledge and skill development, the order in which topics and modules are taught and assessments undertaken, may not align with an individual student's current understanding and experience. For

example my experience of working with students in several Science-based disciplines is that different types of assessments entail different expectations. In written assignments students may be asked to critically evaluate from Year One to achieve higher grades. Conversely exam assessments might start in Year One with multiple choice questions assessing detailed knowledge, and then build over the year, or across years, to the use of exam essays or case studies to assess skills in critical analysis.

This issue connects to Edwards (2011) argument that generic learning processes such as understanding how to approach different types of exam question and revision, or being critical, can be difficult to put into practice. The students firstly needed to understand how these processes operated within their discipline and then make sense of this in relation to their academic practice. Higgs (2014, p.19) asks whether as educators we consider what happens when we introduce students to a new task and whether the 'alignment of learning outcomes, assessment, and teaching methods helps students to not only survive in the liminal space but to be creative, and thrive'. Given that the students were at different stages in their understanding and skill development, one way of helping them to thrive might be to make the course journey clear and discuss different expectations relating to assessments. Also providing opportunities for them to practise the skills required through formative activities allows them to begin the process of applying the knowledge and skills within their own academic practice.

The role of expectations and feelings

Throughout chapters four and five I have highlighted where tensions arose for the students and the role played by expectations and feelings, particularly the role of confidence. Some students' confidence levels were affected when tasks and assessments were introduced as 'difficult', but for others this focused their efforts. This connects to Efklides and Aretouli's (2003; cited in Efklides 2006, p.55) finding that students responded differently to tasks depending on whether it was introduced as interesting or as difficult. The student Aniri's suggestion was for staff to mention the challenge as a 'normal' part of learning and encourage the use of the resources and support available.

The findings demonstrate that students were immersed over time in a complex cycle of challenges and strategy use, which created a range of expectations, tensions, and feelings (also see appendices 20 and 21). In particular difficulties and being stuck affected confidence levels. Felten's (2016, p.6) discussions on threshold concepts with US college students also found that 'learning could not be disentangled from their sense of confidence related to that learning'. Some of the strategies the students used helped manage the particular challenge they were facing. However, in other cases, feelings such as low confidence, frustration or disappointment were the result of using a particular strategy which felt uncomfortable, or one where there was a mismatch between expectations and outcome. Here, the tensions experienced can partly be explained by the fact that their thinking, feelings and behaviour were out of step, or in 'disequilibrium' (Leat 1993, p.507).

Students were then using a variety of strategies to manage their expectations and accept their feelings. These included using the placement experience or future career goals as a way of gaining a different perspective on the issues, giving oneself a motivating 'pep-talk', drawing on previous experiences, and accessing others' support. Sometimes this helped bring a greater sense of integration or congruence, and led to feelings of satisfaction with their education and achievements, but for others this still felt like too much of a compromise. This suggests that it is difficult to describe liminal space and the pathways students take within it as a positive or negative experience, as students will be involved in a cycle of feelings. This aligns with Sansone and Thoman's (2005, pp.508-509) argument that a dynamic pattern of feelings occurs over time and in different contexts, so it is not possible to assume that certain feelings are either 'good' or 'bad' for learning. Despite putting strategies in place, there were times when the students' feelings affected their motivation and learning. Although the students were using a variety of support strategies, it can be also be helpful to ensure that they aware of and can access support offered by the University, for example through academic or pastoral tutors and well-being services.

The findings appear to support the view that 'psychological capital' (Luthans *et al.* 2007), or dispositions such as 'self-efficacy', 'optimism', 'hope' and 'resilience' helped the students in managing their difficulties and navigating liminal space. However, there are two important points to raise here. Firstly, the view represented by the student Dennis, i.e. that sometimes it is important to 'give up' and not continually push yourself through the difficulty, might not immediately fit within this 'positive' framework. Persisting with certain difficulties might be the route some students take, but there will be other pathways, which might include leaving a course. I am therefore cautious about aligning these 'dispositions' with the 'successful' student. I would argue for a more complex view of terms such as resilience, where actions are viewed within the context of what is right for the individual student. Secondly, although students such as Liesje felt her determination was part of her character, I would suggest that the students' previous experiences and access to strategy use were also important elements in managing their difficulties. Luthans *et al.* (2007) claim that dispositions do 'show some malleability' so perhaps rather than seeing them as qualities students have or do not have, it may be helpful to see them as 'ways of thinking or behaving' or 'thinking and behaviour strategies', which students can develop and adapt through experience.

The role of monitoring and reflection in change processes

The findings discussed in chapter five demonstrate that the students used monitoring and reflection techniques on two levels over the course of the year. The variability in whether and when students implemented changes as a result of this reflection has implications for practice in supporting students with these processes. It is also useful to consider how these processes relate to the notions of transition or transformation.

The first type of monitoring and reflection students demonstrated related to 'specific' study strategies such as note-making or revision techniques. Those students who demonstrated an awareness in the first interviews of their strengths and weaknesses were able to do two things. Firstly, they had confidence and trust in their study processes based on the use of previously successful strategies. This allowed them to manage some of the uncertainty

associated with not understanding concepts, or revising large amounts of content. Secondly, they were able to implement changes to perceived weaker skill areas. This process of reflection and planning did not guarantee that students' performed better. It did allow them to take control of their learning and to trial new techniques, while maintaining other more familiar strategies. The students also learnt strategies from others as they progressed through the year, particularly where they thought that their peers had expertise or were performing well.

The second type of reflection students undertook resulted in an increased awareness of changes in themselves as learners and the strategies they were using. Examples included understanding that they did not need to cover all the material in depth, the benefits of working with others and asking for help, the importance of trialling ideas and learning from experience, and recognising the strategies they used to manage difficulties.

It could be argued that the first type of reflection resulted in changes which are part of a process of transition and the second type related to a process of transformation. These two processes did overlap, in that the students drew on the support of others to help with a specific maths difficulty, which resulted in a transition from misunderstanding to understanding. This then changed how they worked with others and created a shift in their view of themselves as a learner, which might be seen as transformational. This supports Schwartzman's (2010, p.40) view that deep cumulative learning comes from 'reflection', but transformative learning comes from 'reflectiveness' (often defined as reflexivity). With deep cumulative learning 'the object upon which one's mental activity is concentrated does not change; rather, one moves one's attention with ease among a multiplicity of its aspects'. For example the student now understands the various aspects related to a mathematical process. With transformative learning 'one's mental activity comes to be concentrated upon a previously unknown and existentially unfamiliar object', so the student now sees working with others as an important strategy for their learning (Schwartzman's 2010, p.40).

Liminal spaces are often associated with transformation and an identity shift (Meyer and Land 2005, p.376; Savin-Baden 2008a, p.74), although Savin-Baden (2008a, pp.70-72) does acknowledge that spaces of transition and transformation can overlap and both have liminal qualities. It can be difficult to define what constitutes an identity shift and therefore whether an experience has been transformational for an individual, so using this as evidence for a student having been in a liminal space is problematic. My view is that the students were experiencing different forms of liminal space related to both deep cumulative learning (transitional changes) and potentially transformational changes. Schwartzman's (2010, p.41) representation of liminal space is helpful here, in that it focuses not on identity transformation, but on 'meaning-making' and reinterpreting what was unfamiliar. She suggests that this allows for a more 'nuanced…interpretation of student experience' (Schwartzman 2010, p.41).

My findings support Schwartzman (2010, pp.34-35) and Savin-Baden's (2008a, pp.110-111) claims that various forms of reflexivity are important in managing difficulties and navigating liminal space. Opportunities to reflect on study experiences, or share them with others, can build confidence and develop the 'learning bridges' (the 'honing of critique', 'reviewing prior experiences of learning' and 'legitimating experience') which Savin-Baden (2008a, pp.110-111) suggests are needed to move through liminal space. It is also important to provide opportunities early in the year and at specific points after this, for students to reflect not just on specific study strategies, but also on generic strategies which work at the level of managing expectations and feelings, understanding how one works with others and the role of time. This latter process of reflexivity could be seen as a linking strategy or a meta-generic strategy. Its use allows students to make sense of their challenges, the factors influencing their difficulties, and the effectiveness of strategies for managing disjunction and being in liminal space.

I am not suggesting that reflexivity is the only answer to the students' difficulties and it can be a challenging process in itself. Students need time and opportunities to develop experience and this often involves being in uncertain and risky places. When students are in new situations or trying out new strategies, and at the same time reflecting on the process, they may experience

periods of confusion. As Leat (1993, p.506) explains 'their habitual skill is disrupted and ruffled by consciousness'. This situation is similar to Osmond and Turner's (2010, p.359) argument that it can be helpful to have an explicit discussion about the process of being stuck, though this might interfere with specific tasks students are engaged in. For Hunt and Sampson (2006, p.4) being reflexive is the ability to be 'both "inside" and "outside" ourselves simultaneously and able to switch back and forth fluidly'. Some students were aware of the existence of these two perspectives, but I would suggest that fluidity comes from creating clear spaces for both immersive and reflective activities. Leat (1993, p.506) suggests that students may need support and reassurance from others such as peers and tutors when engaging in this reflexive process.

Although I did not explore this issue explicitly during the interviews, some of the students shared the fact that the research process had acted as a useful reflexive space. It could be argued that while some of the students were already reflexive thinkers, the act of taking part in the research allowed others the space to develop this as a generic strategy, as Aniri pointed out:

> *I am really pleased with myself that I attended this project with you. That's what helped me I think….I was thinking sometimes of when you receive results or they give you feedback from the test or the practical and you think ahh yes I should have done that better. But now speaking to you that makes huge sense. Honestly I've never sat down and were thinking oh what happened three months ago, how would I have done that better, so I think this will help me. I think I will use this strategy, just maybe reflecting on yourself, not just writing a reflection where they ask you to do feedback from lectures, but your personal reflection, on everything. It couldn't be just your education, you can do this with anything you want* (Aniri-interview2*).*

The role of 'others'

In the previous chapter I did not identify how the students interacted with 'others' as a separate generic strategy, since the students used these relationships throughout the year to manage both specific challenges and being in liminal space. By 'others', I mean face-to-face or online contact with peers, lecturers, other professionals and family, and with others' ideas through the literature. For example some students took the advice of lecturers in making

decisions about what to learn, or used professionals on placement, peers, family members and the literature to help with understanding difficult concepts. The students also used the support of others to manage expectations, accept feelings and feel connected, motivated and encouraged when stuck and unsure how to move forward. Contact with 'others' can therefore be described as an important specific and generic strategy, or one of Savin-Baden's (2008a) 'learning bridges' or Land *et al*.'s (2014a) 'connective' points which help navigate liminal spaces.

The various forms of contact with 'others' not only provided a strategy for managing difficulties, for some students it also created new challenges. For example trying to understand the explanations and views of others while making sense of their own, comparing their strategy use with others, and working with processes and timescales which felt out of their control. A specific example was how much contact the students had with lecturers. Low contact levels with staff were influenced by a lack of confidence for some students, but for others it was because they were using different support strategies. Some students found that increasing their contact with lecturers and peers over the year increased their confidence and motivation levels. Sometimes comments from lecturers or peers created confusion or worry for the students, at other times they were the source of clarification and reassurance. Each individual has to find their own way of working with others. This involves being aware of how much and when they need to be alone, as well as how much and when they want to be in contact with others. This is a difficult and complex journey in itself and not one I can describe fully here. However, this discussion raises questions about the balance between independent study and the support of others such as lecturers and peers, something which could be an area for future research.

Since many of the strategies discussed at a specific and generic level involved students being in contact with 'others', it is important to take account of the social nature of learning and its impact on the students' experience of challenge, difficulty and stuckness. Many of the implications for practice I have identified involve working with students to make metacognitive processes more explicit. Efklides (2008, p.285) states that because this interaction with students functions at the social level, it cannot influence a student's cognition directly

since this has to happen at the personal-awareness level. She explains that metacognitive experiences (such as feeling of difficulty) are important in transforming metacognitive knowledge and skills from the social level into 'personally meaningful knowledge and skills' (Efklides 2008, p.285). In individual support sessions students are already experiencing a feeling of difficulty and have a space where they can focus on their metacognitive feelings, knowledge and skills and make it personally meaningful for them. It is therefore important to create similar reflective spaces in group sessions operating at the social level, so that students can see the relevance to their learning.

The students' peers were an important source of informal support. The value of peer support has been formally recognised in HE with the development of Peer Assisted Learning (PAL) or Peer Assisted Study Sessions (PASS) in the UK, and Peer Tutoring in the US. Andreanoff (2016) found that peer coaching in academic skills increased students' confidence and resulted in a lower attrition rate compared to a control group. Ody (2013) points out that students often comment on how peer-led sessions allow them to ask questions and make mistakes, which they may not do with staff, and in this sense helps to 'normalise the challenges'. Although there are challenges with recruitment, training and appropriate support for peer leaders (Meertens 2016), peer-led support is a strategy which can tap into students' resourcefulness, as well as creating opportunities for skill development. In this respect it has much to offer in supporting students with their experience of challenge, difficulty and stuckness.

A wider view of strategy use in encouraging creativity and resourcefulness: timing, experimentation and evaluation

If the students recognised the value of specific and generic strategies to their learning they differed in when they implemented them. My study uses students' retrospective accounts of how they responded, so it is difficult to ascertain when they became aware of and implemented a strategy. However, the students were of course always responding in some way. So perhaps the important question here is whether the awareness and implementation of a strategy reduced the time they spent feeling stuck or in liminal space. The data suggests that this

depended on their previous experience of the particular challenge, the availability of previously successful strategies, and access to and confidence in using resources. So if a student was facing a new challenge, was unsure what strategies might work and was finding it difficult to access resources or support, then any, or all of these factors might mean they spent longer in liminal space.

Although students can be made aware of potentially useful strategies and the resources available to support them, they also need to find their own ways of working. The students drew on previous strategies, but they did not always work in new settings, so trial and error was important. This involved evaluating what was effective and why, and making appropriate changes. It takes time to experiment with strategies and find what works for you, a difficult thing to do when stuck, or in a liminal space. Often the students did not have the luxury of time, since a looming deadline created pressure to find a successful strategy. For some students this led to feelings of self-doubt and mistrust in their study processes and created a desire for certainty particularly if things continued to feel difficult.

During the interviews and when analysing the data, my view on how the students were responding to challenge and difficulty changed. Initially I assumed that a strategy would be a clear plan which attempted to solve a specific problem. In reality students responded in many different ways: some responses resolved particular difficulties; some did not; and some caused further tensions and challenges. But this is exactly the process of trial and error. We cannot always know what way of thinking or action will work for us, particularly in new and different contexts.

What I want to articulate is a broader definition of strategy use, to include all the ways of thinking and behaving students use to respond to challenges. It is tempting for individuals to see only those strategies which lead quickly to a desired outcome as positive or successful, for example those which resulted in a high exam grade. Although this outcome is important, this view is in danger of missing the diversity of student responses. Walking away from a situation may appear to be a disengaged or a negative response, but it could be the right route for a person at that point in time. As Schwartzman (2010, p.39) argues

framing responses as adequate or inadequate, may not capture the complexity of the situation. It may also mean that the potential learning from a situation is lost.

I am not suggesting that anything goes and as educators we adopt a strategy of letting students learn the hard way, only that we create opportunities for students to explore their decision making processes. Discussing a range of potential strategies early in a course can be helpful, but students also need space to evaluate what is working or not working for them as they move through the course. I am also not suggesting that having the right strategy for a problem is always the answer to managing difficulties and therefore avoiding disjunction or liminal space. This view can lead to further difficulties for an individual which revolve around a particular way of thinking, 'why am I not better at managing myself? Why haven't I found the exact answer to this problem? Why is every strategy I try not working?' These are useful questions and an individual's agency in a situation is important. However, laying the responsibility for difficulties solely at the door of the student, ignores the social and structural factors influencing their experiences. As educators I believe it is our responsibility to consider how the structures we and our institutions create, impact on the students' experiences of and responses to challenge, difficulty and stuckness.

Final conclusions: The importance of challenge in education, challenge-strategy connections and reflections on liminal space

The knowledge boundary challenges also highlight a wider issue about the existence and value of challenges which create uncertainty in education. Savin-Baden (2008a, p.138) argues that we are living in a world of 'chronic uncertainty', so experiences which help students find ways of managing this are important. The students in this study were undertaking a degree which led to a professional qualification. Shulman (2005, p.19) claims that this type of education is about bringing together:

> ideas, practices, and values under conditions of inherent uncertainty that necessitate not only judgment in order to act, but also cognizance of the

> consequences of one's action. In the presence of uncertainty, one is obligated to learn from experience.

He also suggests that these goals of professional education are relevant in other contexts (Shulman 2005). If we are indeed living with chronic uncertainty, then we need to create space to learn from experience. Leat (1993, p.507) suggests courses need to be designed to include challenges since they 'provide a richness of evidence to work from'. He also argues that 'learning cycles' based on experience and reflection allow thinking, feelings and behaviour to be integrated. Feelings are part of every experience, and can be particularly difficult to manage when encountering a new task or when taking a risk. It is therefore important to support students in recognising the role of feelings in accompanying challenges and in potentially indicating a way forward. Finding ways to understand and accept feelings may involve students accessing a range of support services in addition to guidance provided within the teaching context.

Providing students with challenging experiences which create uncertainty connects to what Biesta (2006, p.27) argues is an important role for education, 'it is not just about the acquisition of knowledge, skills and values', but also about 'learning as responding…showing who you are and where you stand'. Biesta (2006, pp.28-29) suggests that this is a challenging process, but that as educators we need to provide opportunities for students to respond 'by asking difficult questions and creating difficult encounters'. As educators we also have responsibilities, not to remove challenges or the factors which influence them, but to work with students to create the conditions where they can grapple with these challenges. This means remaining alert to the changing challenges students are facing and the factors influencing their experiences.

Some form of challenge, difficulty or stuckness was a more widespread and common part of the students' educational experience over their second year than I had expected. Liminal space is often discussed in relation to difficulties with the understanding of difficult concepts (Meyer and Land 2003; 2005). I would argue that the findings in chapter four demonstrate a different type of difficulty, where students were overwhelmed with managing the boundaries

around the breadth and depth of their knowledge. They felt stuck and confused about how to move forward. This resulted in the students facing a different type of disjunction, similar to Savin-Baden's (2007, p.11) 'cycle of stuckness' and resulted in them entering a different type of liminal space. This supports Savin-Baden's (2008a, p.103) argument that there are different forms of disjunction and therefore different types of liminal space.

The research on threshold concepts has expanded to include cross-disciplinary 'procedural threshold concepts' (Davies and Mangan 2010, p.195) and 'learning thresholds' (Edwards, 2011). Similarly I would argue for the same expansion in understanding liminal spaces which may not be connected to conceptual discipline-specific difficulties. Meyer *et al.* (2010, p.xi) highlight the non-linear nature of liminal space, describing it as having 'a degree of recursiveness, and oscillation'. While it is possible to have different movements within liminal space, I would argue that the findings demonstrate that it is possible to be in different liminal spaces concurrently and that students moved in and out of different liminal spaces. The movements were created by the complex mix of boundary challenges, individual 'spiky profiles' (Cottrell 2013a; Happé and Frith 1996) and strategy use. This resonates with Savin-Baden's (2007, 2008a) model of 'transitional learning' where liminal spaces are part of the 'cyclical nature of learning'. Savin-Baden (2008a, p.76) also suggests that we may have misjudged the complexity of liminal space and it is in fact possible to stay in a particular liminal space for long periods while 'normal life' continues.

Throughout the previous chapters and in this discussion I have highlighted where the students' experience of being in liminal space resonated with its descriptions in the literature review. It was often an *unexpected* place for the students which created a complex mix of expectations and feelings. The challenges created situations which were often *open* and uncertain, but at other times *bounded* by curriculum content and assessment structures. The students were certainly *creative* and resourceful in finding their own routes through liminal space. They responded to challenges using diverse ways of thinking and behaving, developing a range of specific and generic strategies as they moved in and out of different types of disjunction and liminal spaces. The complex cycle of feelings and changes which the students' experienced in liminal space

meant that it was difficult to describe the experience in *positive* or *negative* terms, or as always *transformational.*

Strategy use was a more important factor than I had first anticipated in understanding the students' experience of challenge, difficulty and stuckness. I had not fully appreciated the close relationship between challenge and strategy use. The type and timing of strategy use was key in explaining whether a challenge became a difficulty, whether students entered liminal space and how long they spent there. Although the range of strategies the students used helped them to manage the challenges associated with boundaries around knowledge and being in liminal space, they sometimes created further difficulties. In particular, generic strategies acted as connecting themes. The spaces where challenges were encountered were also potential areas for knowledge and skills development, as well as spaces where new questions and challenges emerged. The students' interactions with 'others' were a good example of this relationship, where contact with staff and peers sometimes acted as a vital support strategy and at other times as a source of difficulty. Savin-Baden (2008a, p.115) describes a range of 'boundary spaces' where cultures, politics and knowledge 'overlap and collide', making these 'borderland spaces' challenging. Her argument is that opportunities lie in these boundary spaces, so it is important that they are 'valued and used'. If the experience of moving in and out of liminal space is part of the learning process, then as educators we need to acknowledge the challenges and opportunities it creates. These relationships are illustrated in Figure 4.

Figure 4: Understanding the student experience of challenge, difficulty and stuckness

To conclude, the research project aimed to understand how the students experienced, responded to, and managed challenge, difficulty and stuckness in the learning context during the academic year. In response to the research questions, this thesis contributes to knowledge in four areas.

1. Some form of challenge, difficulty or stuckness was found to be commonplace in the students' educational experience. For students in this study the main challenges concerned boundaries around knowledge.

2. The variation in the students' experiences was partly explained by their 'spiky profiles' (influencing factors such as prior education and work experience) and partly by differences in factors relating to strategy use.

3. The students were found to be creative and resourceful in developing a range of specific and generic strategies in several areas: the use of time and space; the management of expectations and acceptance of feelings; and monitoring and reflection.

4. A complex cycle was found to exist between challenges and strategy use which created a range of expectations, tensions, feelings and opportunities.

As educators on our own educational journeys, we can act as facilitators and guides, but we are not on the side-lines, we are active participants. We can share our knowledge, skills and experiences, while encouraging students to do the same. Whether the students were facing a challenge or had already entered a liminal space, they were certainly being creative. Their desire to understand and the sheer range of strategies they used surprised and encouraged me. It is important for us as educators to tap into this resourcefulness. This is not about avoiding disjunction or liminal space, but seeing these experiences as a regular part of learning and finding ways of managing them which support increased understanding, interest and enjoyment. Seminars, academic skills workshops, peer support programmes and the tutorial system are all possibilities for claiming back territory for reflective spaces. I would argue that creating time and space for challenging experiences and reflexive discussions allows students to take risks, enter liminal space and navigate its complex terrain in order to gain the most out of their educational journey.

Chapter Seven: Final Thoughts

Areas for future research and limitations of the study

The research was conducted with a small sample of students in a specific discipline in one HE institution. This suggests that the findings cannot be generalised to students in other disciplines or institutions. Small-scale qualitative research is always contextual and my goal was not to produce findings which would hold 'true' in other settings. I raised this issue in chapter three (pp.72-73) where I discuss the difference between generalisability and transferability. I demonstrated transferability by providing detailed descriptions at all stages of the study and being transparent regarding the research process and the researcher's positionality. This should allow the reader to assess how the findings might be applicable in their own, new and different settings. For example many of the influencing factors identified in the findings resonate with those discussed in Savin-Baden's and Efklides' empirical research, so an understanding of these factors may also be useful in other HE settings. However, throughout this study the students' experience was deeply influenced by contextual factors. It would therefore be important for staff and students to conduct further research on the experience of challenge, difficulty and stuckness in their own contexts.

Felten (2016, p.7) points out that there is much to learn from 'the experiences and insights of students as learners' and it is in this area that my study offers a contribution to existing knowledge on challenge, difficulty and stuckness. However, students who agreed to participate in my research had some interest in the topic and were perhaps already reflecting on their study issues. Despite having a systematic sampling method which aimed to increase the diversity of the sample, this proved difficult in practice. With more time and resources it would have been interesting to have collected data from other students in the cohort, perhaps through an anonymous questionnaire. There will be a range of reasons why these students did not want to take part in the study and finding ways of researching their views is an on-going challenge.

The research design attempted to capture the students' experiences as they were happening: 'in-process data' (Schwartzman 2010, pp.37-38). Although interview data relies on students' retrospective accounts, the fact that I interviewed them all in the middle of a particularly challenging term, meant that some of the currency of their experience was recorded. I also captured some of their immediate feelings and concerns through the email contact. Nevertheless, how we view our responses is different in hindsight, so the analysis of in-process data would be an area for further research. Methods for doing this include regular email contact or participants creating audio or video diaries; this has to be balanced with participants' time commitments.

The study followed students through one academic year and revealed the importance of time in influencing how their experiences developed and changed. Given time and resources further research could follow students through all three years of their degree to understand their experience over a longer time-scale. Although the interviews I conducted in the final term allowed students to reflect on the year, many of them were still dealing with the challenges. Interviewing them in their final year would allow for a different type of reflection and might reveal how experiences from the second year were applicable to them as third year students. Making connections between theory and practice was an important strategy for managing difficulties and liminal space, particularly for students on this type of course. It would therefore be interesting to interview students who had moved into the workplace to assess the relevance of their university experiences of challenge and strategy use to life beyond their degree.

Reflections on my own learning and practice

The reflections on my learning fall into two main areas: the process of being a student and the doctoral journey; and the influence of my research on my professional practice.

The experience of being a doctoral student has made me walk in the shoes of the students I am working with, which has increased my awareness of the challenges they face. The nerves, anxieties and low confidence I have felt at

points in the journey have sometimes taken me by surprise. I approach most challenges in my personal and professional life through drawing on a combination of my own experience and the support of others. However, I have often felt out of my depth and would say that I found myself in liminal space on several occasions. It was hugely helpful at these points to be reading about this topic as part of the research. I often heard the words of the students in my ears and took their advice.

However, I was acutely aware that I needed to remain reflexive at these points, so that I could recognise the usefulness of my own experiences, but at the same time separate them from the students' accounts contained in the data. I used two main strategies to manage stuckness. Firstly, I would take a break and do something completely different. Wisker and Savin-Baden (2009, pp.242-243) use the term 'busy work' to describe activities which are not about directly writing, for example, reflecting, going for walks, or reading. They found these were 'levers which enabled writers to breach stuckness'. Secondly, I engaged in activities which helped me view the problem differently, such as drawing a picture or a diagram, or having a conversation with myself about the issues. Savin-Baden and Major (2013, p.462) talk about researchers developing 'an internal dialogue with what they are reading'. This is where making reflective notes was helpful and I often made audio recordings which helped create the sense of a conversation.

The research process and the findings have influenced my practice in two specific areas. Firstly, I have made changes to how I plan and teach academic skills sessions. Although time is often short I have worked hard to build in spaces where the students are able to explore needs, identify challenges and share strategies. I am also more explicit in reassuring students that different sorts of challenges are a regular part of the learning process. I have become more aware of how important it is to encourage the students' confidence in their ability to tackle the challenges they face, as well as continuing to raise their awareness of the resources and support available. Secondly, the research findings demonstrated the importance of recognising students' 'spiky profiles' (Cottrell 2013a; Happé and Frith 1996) and the challenges posed by gaps in knowledge and skill areas. My team is already involved in several projects

working with staff and students to identify these gaps at various points in the students' study and provide appropriate support. For example through specific workshops, mentoring and peer support schemes. I can see that my research will be useful in informing this work in the coming months. I have also been involved in a review of the University's personal tutoring framework and I hope the findings from my research will inform developments in this area.

Appendices

Appendix 1: Book excerpt license

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Appendix 2: Academic department consent form

[redacted]

Title of Research Project:
An exploration of students' experience of challenge, difficulty and stuckness in Higher Education

[redacted] **ACADEMIC DEPARTMENT CONSENT FORM**

On behalf of the [redacted] I have been fully informed about the aims and purposes of the project and I give permission for:

- the research project to take place within the department of [redacted] subject to the individual informed consent of participating students

I understand that:

- Data produced as part of the research project will remain confidential to the researcher and student participants. A separate report will not be produced for Departmental staff, but they will have access to information which is in the public domain in the form of the EdD thesis or research papers.
- If points need to be made in the thesis write-up which refer to the role of staff, or the structure of the academic programme, care will be taken to make the points constructively and not to identify individual members of staff, or the department.

[redacted] 16/7/13
(Date)

[redacted] (HEAD OF DEPT)
(Printed name)

One copy of this form will be kept by the department representative; a second copy will be kept by the researcher.

If you have any concerns about the project that you would like to discuss, please contact:
Rachel Canter (Researcher) - [redacted]

Data Protection Notice: The University of [redacted] is a data collector and is registered with the Office of the Data Protection Commissioner as required to do under the Data Protection Act 1998. The information you provide will be used for research purposes and your personal data will be processed in accordance with current data protection legislation and the University's notification lodged at the Information Commissioner's Office. Your personal data will be treated in the strictest confidence and will not be disclosed to any unauthorised third parties without your further agreement. The results of the research will be published in anonymised form, unless you request otherwise.

Appendix 3: Background information on participant group

Pseudonym	Gender	Age at first interview in Year 2	Students' description of their previous study
Lucy1	Female	33	Access to Science Course – FE College UK A Levels (PE, History, Music)
Ruby	Female	19	A Levels (Biology, Politics, Maths) - State school UK
Frances	Female	35	Access to Healthcare Course - FE College UK
Louise	Female	21	BTEC National Diploma Health and Social Care - FE College UK A Levels (Business, English Lit, Psychology) - State school UK
Liesje	Female	45	Access to Science Course – FE College UK
Alya	Female	21	2 year Foundation course – FE College UK School studies outside the UK
Darryl	Male	25	Access to Science Course - FE College UK BTEC National Certificate in Business A Levels (Art, History, English, IT) – State school UK
Matilda	Female	43	Access to Healthcare Course – FE College UK School studies outside the UK (A Level equivalent in Maths, English, Science, Economics, History)
Lucy2	Female	49	Science course and postgraduate diploma in Business – Open University 2 years of Science degree outside the UK. School studies outside the UK
Aniri	Female	19	A Levels (Human Biology, Chemistry, a language), AS Levels

			(Maths and French) – State school UK School studies outside the UK, joined UK school system in year 9
David	Male	26	2 years of Medical degree UK university A Levels (Chemistry, Biology, Physics), AS Level (Computing) - FE College UK
Dennis	Male	20	A Levels (Biology, Chemistry, Maths), AS Level (Economics) - UK school Previous school studies outside the UK
Gloria	Female	20	A Levels (Biology, Chemistry, Maths), AS Level (History) - State school UK
Tegan	Female	19	International Baccalaureate (IB) – in medium of English, outside the UK. Previous school studies outside the UK
Jane	Female	20	A Level (Psychology) - FE College UK A Levels (Chemistry, Biology, History), AS Level (Maths) - State school UK
Julie	Female	20	1 year of Science degree, A Level equivalents in medium of English, outside the UK

Note: Two students chose Lucy as their pseudonym, so they are named as Lucy1 and Lucy2.

Appendix 4: Presentation made to initial AHPC cohort

Appendix 5: Information for participants

Title of Research Project: **An exploration of students' experience of challenge, difficulty and stuckness in Higher Education**

What is the project about?

The project aims to explore students' experience in Higher Education of challenge in the context of their academic study. This will involve trying to understand more about what triggers these experiences and how individuals respond to and manage these experiences in educational settings. The project will take a case study approach, collecting qualitative data through interviews, observations, email conversations and analysis of participants' written work.

I have chosen to work with [redacted] because the course attracts a diverse group of students, as well as being a challenging and varied degree programme.

Why is this research important?

- Expanding knowledge - very little has been written about the challenges experienced by 2nd year students in Higher Education.
- Improving learning and teaching practice - understanding the challenges experienced, and how you respond will potentially have an impact on the learning and teaching of future students and staff.

What might you gain from taking part?

- A better understanding of your own learning process and yourself as a student - which should help with your studies in year 2 and beyond.
- You will be contributing to a postgraduate research project and learning first-hand about the research process. This may be helpful for your final year project, future work and good for your CV.
- There could be other opportunities depending on your own interests e.g. doing presentations.

What will your participation in the project involve?

- An initial information meeting.
- Three individual interviews – one each term (option to have a different form of contact in term 2)
- Regular but brief email contact.
- Other possible ways of collecting data will be decided with you as appropriate e.g. sharing documents such as assignment work.
- You are free to withdraw from the project at any point.

What will the data be used for? (Please also see the section on anonymity below)

- The data will form part of a case study written up as part of the doctoral thesis.
- The data may also be shared as part of presentations at meetings and conferences, or in the form of research articles or papers.

You will be offered the opportunity to view copies of the interview transcripts or completed case studies to make sure you are happy with my interpretation of your comments. You also have the right to refuse permission for the publication of any information about you.

As a participant how will your anonymity be assured?

- You will have the option to meet individually with me if you would prefer not to be part of an initial group meeting.
- Individual interviews will take place in the [redacted] interview rooms, which are a neutral central space outside your department building.
- In any documents which form part of the thesis write-up, presentations, or articles and may therefore be shared with a third party, you will not be identified by name, but will be referred to using a pseudonym.
- All data collected as part of the study will be stored securely on a password protected drive at the University, or in a lockable cupboard if in written form.

Also if points need to be made in the write-up which refer to the role of University staff, or the structure of the programme, care will be taken to make the points constructively and not to identify individual members of staff.

If you have any questions or concerns about the project that you would like to discuss, please contact Rachel Canter (Researcher), Tel: [redacted]
email: [redacted]

Data Protection Notice: The University [redacted] is a data collector and is registered with the Office of the Data Protection Commissioner as required to do under the Data Protection Act 1998. The information you provide will be used for research purposes and your personal data will be processed in accordance with current data protection legislation and the University's notification lodged at the Information Commissioner's Office. Your personal data will be treated in the strictest confidence and will not be disclosed to any unauthorised third parties without your further agreement. The results of the research will be published in anonymised form, unless you request otherwise. (Revised March 2013).

Appendix 6: Experience so far and expression of interest forms

Title of Research Project:

An exploration of students' experience of challenge, difficulty and stuckness in Higher Education

Experience So Far…

Thinking back to your academic work in year 1 – overall how challenging did you find it?

Not challenging at all	One or two things were challenging	Quite a few things were challenging	Most things were challenging	Everything was challenging

What did you find most challenging or least challenging and why?

……

……

……

……...

……

Expression of Interest

I attended the event on Friday 27th September 2013 at which Rachel Canter provided some preliminary information about this research project.

☐ I am not interested in receiving further information about the project

or

I am interested in receiving further information about the project and would like Rachel to contact me via email to arrange a suitable time to discuss the project in more detail.

Please tick to indicate your preference regarding this second meeting

☐ I am happy for this second meeting to take place with other students

☐ I would prefer to meet individually with Rachel

My email address is as follows:
……

I understand that signing this form does not commit me to taking part in the project, and that, even if I do decide to participate in the project, I will be free to withdraw at any time.

.....	.....	……
(Signature)	(Printed name)	(Date)

If you have any questions about the project that you would like to discuss, please contact Rachel Canter (Researcher) Tel: [redacted] email: [redacted]

Data Protection Notice: The University of [redacted] is a data collector and is registered with the Office of the Data Protection Commissioner as required to do under the Data Protection Act 1998. The information you provide will be used for research purposes and your personal data will be processed in accordance with current data protection legislation and the University's notification lodged at the Information Commissioner's Office. Your personal data will be treated in the strictest confidence and will not be disclosed to any unauthorised third parties without your further agreement. The results of the research will be published in anonymised form, unless you request otherwise.

Appendix 7: Year two students' perceptions of level of challenge in year one - based on information from initial interest forms

Year two AHPC cohort perceptions of levels of challenge experienced in year one

	Not Challenging at all	One or two things were challenging	Quite a few things were challenging	Most things were challenging	Everything was challenging	Totals
Female		7	18	2	1	**28**
Male		3	9			**12**
Not known		4	6	5	1	**16**
Totals		**14**	**33**	**7**	**2**	**56**

Year two AHPC participant group perceptions of levels of challenge experienced in year one

	Not Challenging at all	One or two things were challenging	Quite a few things were challenging	Most things were challenging	Everything was challenging	Totals
Female		5	8			**13**
Male		1	2			**3**
Totals		**6**	**10**			**16**

Note: The final participant group did not include any of the students who stated that most or everything was challenging in their first year.

Appendix 8: Student information meeting notes

Attended Date:

Tasks / Activities	Resources
• Explain interview process again and the areas I will cover. • Explain anonymity (will need to think of a Pseudonym), confidentiality, data storage issues etc. • Ask them to let me know if they have any special needs which I should be aware of.	Student Information sheet for any who need it Use my ethics approval form notes
• Discuss the use of the email and when (mainly in term 2).	Copies of email to explain
• Discuss timings for first interview.	See availability sheet
• Sign 2 copies of consent forms, but will destroy if change their mind.	Consent forms
Other / Questions / Notes	

Appendix 9: Participant consent form

Title of Research Project:

An exploration of students' experience of challenge, difficulty and stuckness in Higher Education

I have been fully informed about the aims and purposes of the project at meetings with Rachel Canter and by reading the information sheet she provided.

I understand that:

- there is no compulsion for me to participate in this research project and, if I do choose to participate, I may at any stage withdraw my participation and may also request that my data be destroyed
- I have the right to refuse permission for the publication of any information about me
- any information which I give will be used solely for the purposes of this research project, which may include publications or academic conference or seminar presentations
- the information which I give may be shared by the researcher with her supervisors but this will always be in an anonymised form
- all information I give will be treated as confidential
- the researcher will make every effort to preserve my anonymity

..... …… ....

(Signature of participant) (Printed name of participant) (Date

One copy of this form will be kept by the participant; a second copy will be kept by the researcher.

If you have any questions or concerns about the project that you would like to discuss, please contact Rachel Canter (Researcher), Tel: email:

Data Protection Notice: The University of is a data collector and is registered with the Office of the Data Protection Commissioner as required to do under the Data Protection Act 1998. The information you provide will be used for research purposes and your personal data will be processed in accordance with current data protection legislation and the University's notification lodged at the Information Commissioner's Office. Your personal data will be treated in the strictest confidence and will not be disclosed to any unauthorised third parties without your further agreement. The results of the research will be published in anonymised form, unless you request otherwise.

Appendix 10: Notes and questions for first interview – term one 2013

1. Firstly I will explain what I am going to cover in the first interview.
2. Explain that they are free to stop the interview at any point.
3. Explain the confidentiality situation again.
4. Discuss the recording of the interview and that I might also make some notes.
5. Check if the student has any questions.

Main purpose of this interview is two-fold:

1) For the student to reflect on what challenges they are currently facing (if any) with their academic work, what is influencing their experience and how they are managing these challenges. It may also explore their hopes, expectations and concerns for the coming months.
2) For the student to reflect on last year's experience in relation to their academic studies – i.e. what challenges they experienced if any, how they approached these challenges, what was helpful / unhelpful.

The balance of questions focused towards the current situation and reflecting back will depend on the timing of the first interview and what is happening with the student at that point in time. My aim would be to start with the experience this term, but perhaps then link this with their experiences last year where appropriate.

Main Research Questions	**1) How do students experience challenge, difficulty and stuckness in the context of their academic learning?**	2) **How do students respond to and manage challenge difficulty and stuckness in the context of their academic learning?**
Sub questions	1a) What challenges do students experience? 1b) What factors trigger the feelings of difficulty	2a) How do students respond to disjunction? 2b) What are students feeling as they experience the process? 2c) How would they describe the experience? 2d) What strategies are students using to manage the process? 2e) What factors are influencing their use of strategies?

Student:	**Date:** **Time:**	**Venue:**
Gender M / F	**Age**	**Previous Education** (e.g. school, college university, private / public)
Any disabilities or learning issues	**Previous Qualifications**	
	GCSEs	
	O-levels / CSE	
	A Levels	
	BTEC	
Other comments / notes / actions	Access	
	Degree	
	Higher degree	
	Professional Quals	
	Other	

Opening Question: Can you tell me about your experience so far this term in relation to your academic studies?
- for example:

General Focus	Possible questions	Additional notes /comments
WHAT	Are you finding any particular things challenging?	
	Are you finding any particular things straightforward or easy?	
	What is it about that task / process - that makes you describe it as a challenge or - that makes you describe it as easy?	
	What is it about……that was particularly challenging / easy?	
TRIGGERS / WHY	Try to get at what is making (has made it) difficult or easy? - Task difficulty - Task presentation & organisation - Learner issues - Subject content, disciplinary lens, learning process – may not use those terms.	
Discipline	Do you think the challenges or difficulties have anything to do with the specific subject or discipline? Why? Are they unique to your discipline?	
FEELINGS	How are you feeling (did you feel) about the situation? How does being challenged make you feel?	

	What things are affecting your feelings? / were affecting them at that time?	
RESPONSE / MANAGEMENT / STRATEGIES	How are you responding (did you respond) to the situation?	
	How are you managing (did you manage) the process?	
	Are there any particular things you are doing (you did) to help the process or solve the problem?	
	What things are (were) most helpful? Why?	
	What things are (were) least helpful? Why?	
TIME / TRANSITION Look for other transition phases	Did your response change throughout the task / term / year – why? Were particular points in the year important?	
FEELINGS	How are you feeling (did you feel) about the situation? What things are affecting your feelings (were) affecting them at that time?	
EXPERIENCE OF STUCKNESS OR STRUGGLE? *Stay with using the term 'challenge' and only use term like stuck or struggle if the student is starting to describe the experience in that way*	Was that something that was a challenge throughout last year?	
	Is that still something you find difficult?	
	Would you describe yourself as being 'stuck' or 'struggling' with anything?	

FEELINGS	Would you describe the experience as negative or positive? What elements are / were negative or positive? What influenced that? / What things are affecting your feelings? / were affecting them? Did those feelings change at any point? Why?	
RETURN TO **RESPONSE AND STRATEGIES & EXPERIENCE OF THIS BEFORE**	Would you say you have felt like this before? Have you been struggling with academic work before? What did you do then?	
TIME / TRANSITION Look for other transition phases	Did your response change throughout the task / term / year – why? Were particular points in the year important?	
ROLE OF OTHERS / SOCIAL ASPECTS OF LEARNING	Do you (did you) share your concerns with anybody or ask for any help?Was that useful?	
	How much do you use staff other students for support?	
	Are there (were there) reasons why you wanted to manage it on your own?	
ROLE OF IDENTITY/ POWER / PERSONAL VOICE	*Probably won't ask questions directly about this, but perhaps explore things if they come up.*	
LOOKING AHEAD	What are your hopes, expectations, or concerns for the next few weeks / months?	

Appendix 11: Students involved in pilot interviews

Discipline / year	Age	Gender	Previous education
Law year two	20	Male	A Levels
Drama year two	19	Female	BTEC National Diploma plus one A Level

Appendix 12: Second interview notes and questions – term three 2014

1. Firstly I will explain what I am going to cover in the interview.
2. Explain that they are free to stop the interview at any point.
3. Explain the confidentiality situation again.
4. Discuss the recording of the interview and that I might also make some notes.
5. Check if the student has any questions.

Main purpose of this interview is two-fold:

1. For the student to reflect on the challenges experienced this year and any current challenges with their academic work. This includes reflecting back on term 1, the term 2 placement and current assessments / exams.
2. For the student to reflect on what was and is influencing their experience and how they managed / are managing these challenges. It may also explore their hopes, expectations and concerns for the coming third year.

Main Research Questions	**3) How do students experience challenge, difficulty and stuckness in the context of their academic learning?**	4) **How do students respond to and manage challenge difficulty and stuckness in the context of their academic learning?**
Sub questions	1a) What challenges do students experience? 1b) What factors trigger the feelings of difficulty	2a) How do students respond to disjunction? 2b) What are students feeling as they experience the process? 2c) How would they describe the experience? 2d) What strategies are students using to manage the process? 2e) What factors are influencing their use of strategies?

The questions below reflect the initial focus of the research questions, but also pick up on evolving common themes from interview 1. The focus on particular areas of questioning with an individual will depend partly on what the student said in interview one. I am therefore aiming to balance a discussion of their current reflections with questions which follow up on issues raised in interview 1.

Key: Themes / Areas for Questioning

Interview Plan

<table>
<tr><td>Phase 1 – Review of first term</td><td rowspan="3">Priority Areas
KNOWLEDGE BOUNDARIES
TIME MANAGEMENT /CONTROL
EXAM / WRITTEN ASSIGNMENT STRATEGIES / STUDY STRATEGIES
ROLE OF PLACEMENT IN LEARNING

Less of a Priority
ROLE OF IDENTITY/POWER / PERSONAL VOICE</td><td rowspan="3">EXPERIENCE OF STUCKNESS OR STRUGGLE?

EXPERIENCE OF STRESS MANAGEMENT / RESILIENCE?

ROLE OF OTHERS / COMPETITIVE VS SUPPORTIVE CULTURE

FEELINGS / EMOTIONS,

POINTS MORE UNIQUE TO THE INDIVIDUAL</td></tr>
<tr><td>Phase 2- PLACEMENT EXPERIENCE</td></tr>
<tr><td>Phase 3 – Challenges this term – have you changed anything as a result of phase 1 and 2</td></tr>
<tr><td>Final Reflections</td><td>Role of challenge in learning?

Were particular points in the year important for you in terms of challenge and managing this?</td><td></td></tr>
<tr><td>Check data / details</td><td></td><td></td></tr>
</table>

Complete at end

Student:	**Date:** **Time:**	**Venue:**
Gender M / F	**Age**	
Previous Education (e.g. school, college university, private / public)	**Previous Qualifications**	**Reason for choosing Med Imaging degree**
Any disabilities or learning issues	**Estimated Average Grade for this year?**	
Other comments / notes / actions		

General Focus	Possible questions	Additional notes /comments
Phase 1: REVIEW OF LAST TERM **Experience of stuckness or struggle?** **Experience of stress management / resilience?**	Looking back how do they feel about the challenges last term? What would you say were the main challenges reflecting on it now? Why / key influences? *(Should I go over this again?)*	
	What do you think you did well last term? Why / key influences?	
	Which Qualities / attitudes / strategies were the key ones in getting you through? **(Stress Management / Resilience?)(Experience of stuckness or struggle?)**	
	Would you or could you have done anything differently? What would be your advice to your first year self?	
	Was there anything which would have helped your learning? (teaching, support etc.)	
	Do you feel you have changed in any way as a learner, as a person?	
TIME MANAGEMENT /CONTROL	How is this connected to the issues below for the individual?	
KNOWLEDGE BOUNDARIES e.g. breadth with pathology, depth of understanding with Maths / Physics **(Stress Management / Resilience)**	How did this feel? How did you manage this?	
	How did you make decisions about where to draw the boundaries? **e.g. Levels of understanding vs memorising**	**IMPORTANT TO ASK**
	Do you think this is an important skill? *(not sure about this?)*	

(Experience of stuckness or struggle?)	Would anything have made it more manageable? Could anyone prepare you for this?	
Discipline	Do you think the challenges or difficulties have anything to do with the specific subject or discipline? Why? Are they unique to your discipline?	
EXAM / WRITTEN ASSIGNMENT STRATEGIES **(Stress Management / Resilience)** **(Experience of stuckness or struggle?)**	How do you now view the challenges with these types of assessment and yourself as a learner?	
	Have you changed the way you approach these assessments? How and Why?	
	Are there things which would have been helpful for you this year in relation to these assessments?	
ROLE OF OTHERS / COMPETITIVE VS SUPPORTIVE CULTURE	Have you changed over the year in how much you work alone or how much you work with others?	
	How do you find the group environment?	
Phase 2: PLACEMENT **(Stress Management / Resilience)** **(Experience of stuckness or struggle?)**	How was the placement? Challenges? Things you felt you did well? Why / key influences?	
	How did you manage the challenges? Strategies used?	
	Did you feel you learnt things? Does the placement What/why/how?	
	What role does the placement play in your learning? **Has the placement influenced how you view term 1 or how you view this term / next year?**	**IMPORTANT TO ASK**
	How does the job influence how you see yourself, the challenges on the course, and your approach to studying?	
	How did the assessments go?	

FEELINGS / EMOTIONS, include emails as well here **(Experience of stuckness or struggle?)** **(Stress Management / Resilience)**	How are you feeling about this year? Ones mentioned in emails: Bored, under pressure, enthusiastic, stressed, involved, tired, relaxed, struggling, motivated, overwhelmed, confident, stuck, interested, focused.	
	Do these feelings influence your studies? How, why?	
	Do these feelings influence how you approach / manage challenges? How, why?	
	Have your feelings changes throughout the year?	
	How does the experience of being challenged, finding things difficult, being stuck, struggling feel to you?	
TIME / TRANSITION **(Experience of stuckness or struggle?)** **(Stress Management / Resilience)**	**Were particular points in the year important for you in terms of challenge and managing this?**	**IMPORTANT TO ASK**
	Best and worst things about the year? Your best achievement?	
	How are you feeling about next year? - Hopes, expectations, or concerns?	
ROLE OF IDENTITY/ POWER / PERSONAL VOICE **(Stress Management / Resilience)**	Does the course feel right for you? Does it fit with your view of yourself as a learner and a person?	
	How much control do you feel you have over your learning?	
FEEDBACK *May not have time for this, could email them afterwards?*	How did you find the interview? Is there anything you want to feed back about the process?	

Appendix 13: Email questionnaire

Dear ……

1. On the scale of 1-4, for each of the tables below, please **insert an X** in the box which best indicates how things are in relation to your academic studies at the moment.

Not challenging	1	2	3	4	Very challenging

I'm managing things	1	2	3	4	I'm not managing things

2. Please <u>underline</u> any of the words which describe how you are feeling, or feel free to add some other words

Bored, under-pressure, enthusiastic, stressed, involved, tired, relaxed, struggling, motivated, overwhelmed, confident, stuck, interested, focused

3. <u>Additional comments?</u>
   For example you might want to give a few more details about:
   - Particular things you are finding easy or challenging at the moment.
   - Why you think that is.
   - Why you are feeling the way you have described in question 2.

Appendix 14: Transcription style

I used both 'Naturalized' and 'Denaturalized' transcription styles which is a common approach (Oliver *et al.* 2005, p.1280). Both styles are verbatim translations, but the former places more emphasis on capturing pauses, word emphasis and non-verbal behaviours. I did not transcribe all pauses and 'ums' or 'ers', but I did note where these elements stood out, or where students laughed or were sarcastic to convey particular meanings (see extracts below).

Extract 1

I: What do you do when you feel like that?

R: I tend to go to the gym, I go to the gym quite a lot. I tend to go and speak to people and stuff. I think that is one of my problems sometimes when I'm in my room and I get bored of revising, I'd then be like I'm bored and I'm not going to do anything and I'll go and speak to people which is fine, but then I have to be careful that I'm not always bored of revising *(laughs).*

Extract 2

I: …With the MRI stuff, can you put your finger on what it is about that which makes it feel quite difficult?

T: *(Thinking, long pause)* I think it's because I can't visualise it, which makes it harder for me because I like to have a visual of it and most of it is just in writing.

Appendix 15: Summary of hand-coded categories after code-mapping exercise

- **TRANSITION TO UNIVERSITY**
  Educational background and experiences
  Work experience
  Personal / social factors
- **CHALLENGES**:
  Personal / social challenges
  Challenges relating to feelings / attitudes / skills / expectations
  Financial / paid work related / future study challenges
  Academic challenges *(content quantity / volume, understanding difficult concepts, exams and revision challenges, teaching issues, time management, strategy use and timing, note-making challenges, writing challenges, challenges with studying with others / groupwork challenges)*
  Liminal space / stuckness
- **THINGS WHICH WERE STRAIGHTFORWARD**
- **ATTITUDES / OBSERVATIONS / BELIEFS / BEHAVIOURS ABOUT LEARNING**
  Learning preferences
  Benefits of studying with others
- **TEACHING STRATEGIES – USEFUL OR SUGGESTED**
  Issues around course content / structure
- **STRATEGIES:**
  Positive / helpful
  Personal / social strategies
  Financial / paid work related / future study challenges
  Academic strategies
  Strategies relating to feelings / attitudes / skills/ expectations
  Stress management strategies
  Liminal space / stuckness strategies
  Understanding task complexity
  Understanding task difficulty
  Strategies for understanding difficult concepts
  Strategies for managing content quantity / volume

Exams and revision strategies

Time management strategies

Strategy use and timing

Note-making strategies

Writing strategies

Strategies relating to studying with others / group-work / alone / support from staff

Motivational strategies

Negative / unhelpful

Speed / ease / efficiency

Time consuming / difficult

Self-selected / suggested by others

- **QUALITIES / BEHAVIOURS**
- **BOUNDARIES**
- **DIFFICULTIES / IMPORTANCE / INFLUENCE / VALUE OF PLACEMENT:**

  Difficulties / challenges

  Importance / influence / value
- **FEELINGS / ATTITUDES / BEHAVIOURS OVER TIME-SCALES:**

  Year One (retrospective)

  Year Two term one

  Year Two term two (placement)

  Year two term 3

  The overall Year Two

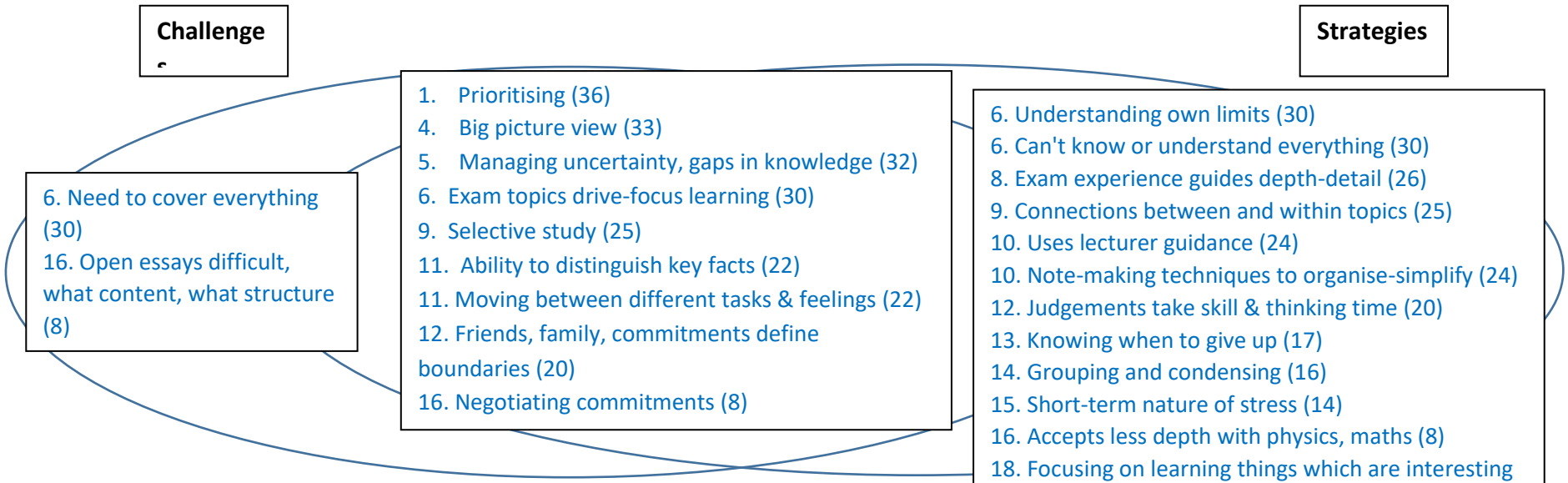
  Changes over Year Two

  Year Three (prospective)

Appendix 16: Diagrams and mapping processes

Used to explore the connections between the boundaries category and other main categories

Boundaries sub-codes grouped into challenges / strategies / both



Ranges of movement (dilemmas and decision making strategies)

2. Deep vs surface (35)
3. Control, own decision making (34)
6. Detail vs time (30)
7. Boundary forced, not chosen (29)
8. Learning for exams vs learning for work-life (26)
8. Independence vs support from others (26)
10. Good radiographer vs good student (24)
11. Moving between detail and big picture (22)
17. Balancing self-criticism and motivation, reward (7)

Going back to the Boundaries codes what are the main areas of challenge or strategy or both?

(I need to look where other code areas might come in here?)

1. Prioritising (36) – As a challenge it is how do you make the decisions? What criteria do you use? This relates to a number of questions and contexts (Assessments: exams university-based and practical, on placement plus other coursework assessments, general studying, work and home life etc.)

What do you choose to learn? What influences the decisions? Where are the boundaries around the subject knowledge and skills developed?

2. Deep vs surface (35)
6. Detail vs time (30)
6. Need to cover everything (30)
6. Exam topics drive-focus learning (30)
8. Exam experience guides depth-detail (26)
11. Ability to distinguish key facts (22)
11. Moving between detail and big picture (22)
16. Open essays difficult, what content, what structure (8)
19. Focusing on some subjects or all (2)
16. Accepts less depth with physics, maths (8)

Content quantity – volume (no. 3 code under Challenges, 41)

How do you learn? What constitutes learning? How much depth and detail do you include?

9. Selective study (25)
5. Managing uncertainty, gaps in knowledge (32)
12. Judgements take skill & thinking time (20)

How do you spend your time?

Who is making the decisions, what choices can you make?

7. Boundary forced, not chosen (29)
12. Friends, family, commitments define boundaries (20)
16. Negotiating commitments (8)
6. Understanding own limits (30)
6. Can't know or understand everything (30)
13. Knowing when to give up (17)
18. Focusing on learning things which are interesting (4)
3. Control, own decision making (34)
8. Learning for exams vs learning for work-life (26)
8. Independence vs support from others (26)
10. Good radiographer vs good student (24)

How do you feel?

11. Moving between different tasks & feelings (22)

15. Short-term nature of stress (14)
17. Balancing self-criticism and motivation, reward (7)

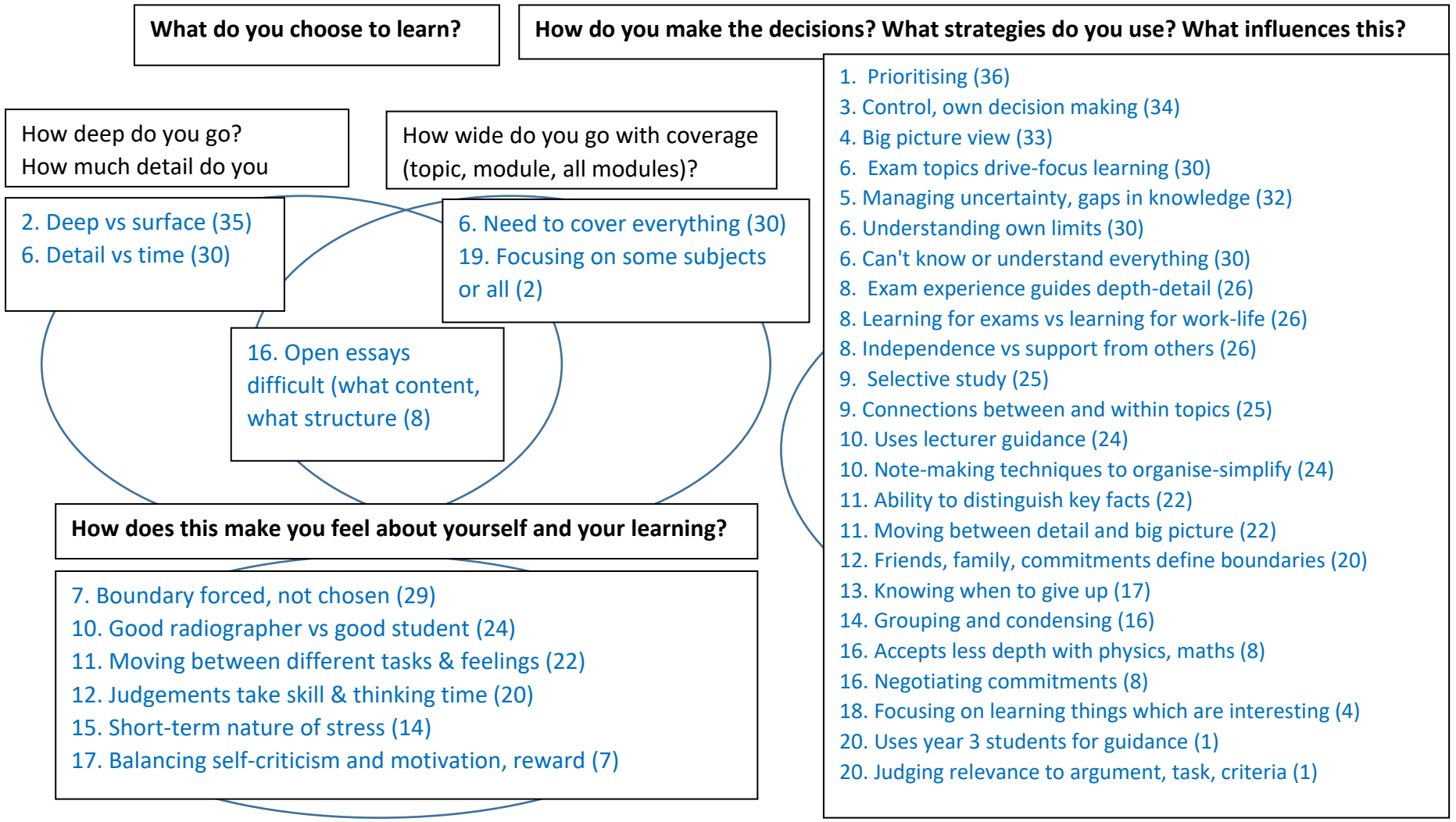
General strategies
4. Big picture view (33)
9. Connections between and within topics (25)
10. Uses lecturer guidance (24)
10. Note-making techniques to organise-simplify (24)
14. Grouping and condensing (16)
20. Uses year 3 students for guidance (1)
20. Judging relevance to argument, task, criteria (1)

Ranges of movement (dilemmas and decision making strategies)

2. Deep vs surface (35)
3. Control, own decision making (34)
6. Detail vs time (30)
7. Boundary forced, not chosen (29)
8. Learning for exams vs learning for work-life (26)
8. Independence vs support from others (26)
10. Good radiographer vs good student (24)
11. Moving between detail and big picture (22)
17. Balancing self-criticism and motivation, reward (7)

I also now need to start looking at some of the student data in the above categories, so that I can pick some key examples which show the variations and story over the year.

Boundaries sub-codes – initial grouping into key questions / categories



As mentioned previously I also need to look at where these issues come up with other codes. There isn't enough room to add them to diagram 2 at this stage but I am listing them below

Key Boundary Challenges?

What do you choose to learn?
- How deep do you go into a topic?
- How wide do you go with the coverage of a topic or across a module, or across all modules?
- How do you manage uncertainty and gaps in knowledge?

Exams and Revision (No. 1 under Ac Ch (51)
Content Quantity-volume (No. 3 under Ac Ch (41)
Writing (No. 7 under Ac Ch (23)

How do you make the decisions about the above issues? What influences this?
Time management (No. 2 under Ac Ch (43)
Teaching Issues (No. 5 under Ac Ch (29)
Strategy Use and Timing (No. 9 under Ac Ch (18)

QUALITIES AND BEHAVIOURS – Also crosses over with Feelings below
PLACEMENT – Also crosses over with Feelings below
STUDENT STRATEGIES (A variety of ones here which would be applicable, some of which match the topics under challenges)
TEACHING STRATEGIES
TRANSITION – Also crosses over with Feelings below.
TIME – Also crosses over with Feelings below.

How does this process make you feel about yourself and about your learn?
Liminal space-stuckness (No. 4 under Ac Ch (51)
Partial-fragmented understanding (No. 5 under Ac Ch (29)
Unsure of learning approaches (No. 8 under Ac Ch (19)
Challenges (Feeling, attitudes, skills, expectations) (joint first under challenges with Academic
Challenges (58)) – Also crosses over with above question on strategies and influences.

VIEWS ON LEARNING – Also crosses over with decisions / strategies above

Not quite sure where the whole challenge area of 'Understanding difficult concepts' comes into the Boundaries issues. It obviously links to liminal space and stuckness, so might need to be a separate category of challenge?

STRAIGHTFORWARD THINGS

Key Boundary Issues from Dennis interviews

Identified in interview 1 and followed through in interview 2

Boundaries around Knowledge
B1: Content Quantity / volume
B2: Gaps in knowledge
B3: Difficulty with uncertainty – in context of placement
B5: Boundaries in the context of a written assignment, content, depth, breadth, style

B4: Boundaries around time and stress levels

Identified in interview 2 as a new boundary area

B6: Shifting the boundaries of his thinking (B6) - making him think differently, expanding his thinking, thinking more critically. This is a **new boundary area emerging for Dennis**,

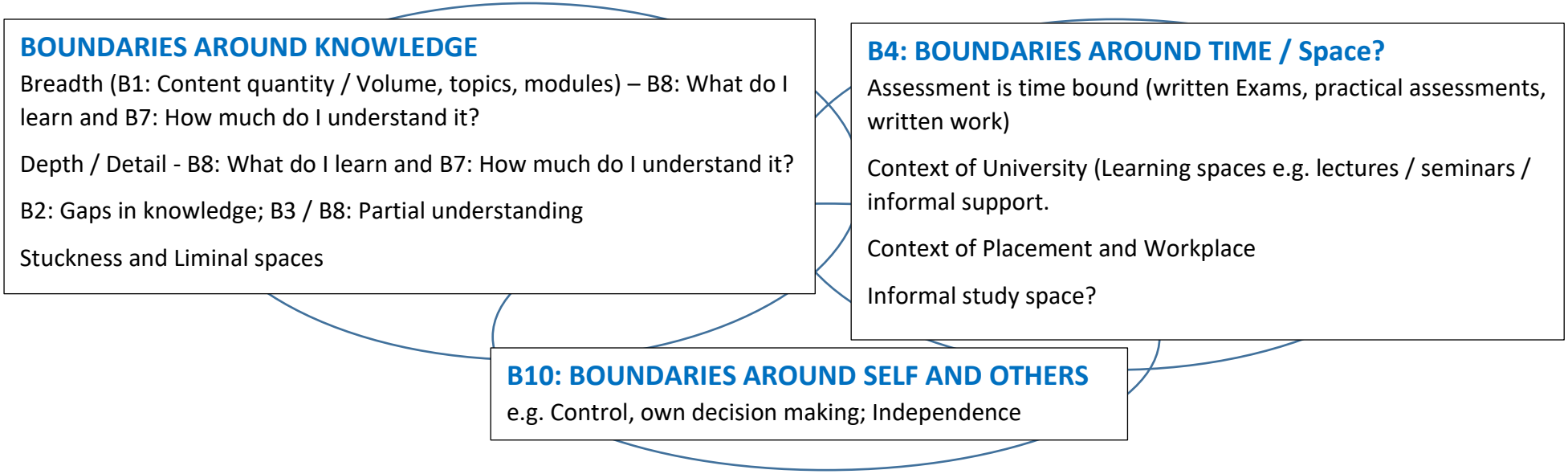
Key Boundary Issues from 3 further interviews (Louise, Liesje and Alya) 16/11/15 and 19/11/15

Boundaries around Knowledge
B1: Content Quantity / volume
B2: Gaps in knowledge
B3: Difficulty with / managing uncertainty / **partial understanding** – in context of placement, **exams / revision, written work**
B5: Boundaries in the context of a written assignment, content, depth, breadth, style
B8: What do I learn?
B9: Boundaries around achievements /expectations
B12: Boundaries around big picture and detail, i.e. breadth and depth.

B4: Boundaries around time and stress levels
B6: Shifting the boundaries of his thinking / **Boundaries around thinking**
B7: Boundaries around understanding – I did have this there with Dennis, but didn't quite see it as a separate boundary issues at that stage.

B10: Boundaries around self and others
B11: Boundaries around behaviours

Key boundary areas



Not sure whether these areas thread through the other Boundary areas or if they are another intersecting oval?
Feelings (Uncertainty, stress); Qualities; Skills, Motivations; Behaviours
B6: Boundaries around thinking (attitudes, expectations, perceptions, views on learning, big picture / detail) – This is certainly and important area.
Do SPIKY PROFILES (Cottrell 2013a; Happé and Frith 1996) and TRANSITION issues come in here?

These main boundary areas can create challenges independently or in combination with each other, at their intersections. They are also the spaces where strategies are used and developed. What is the importance of the intersections? Are they the places of most stress and difficulty, but also the places where strategies form and change is possible? Are they the places of learning? Not all learning has to be a struggle or stressful, but there probably needs to be a boundary shift for learning to take place e.g. some expansion in knowledge / understanding.
Is a difficulty a challenge without a strategy? This doesn't have to be an immediate solution, but it can be an attitude or a way of thinking which allows you to cope with things or move forward. How important is making connections and moving between the detail and the big picture? Which are also about boundaries and their overlaps, intersections.

Boundaries Codes grouped by Boundary area. All elements relate to ways of thinking and behaving, additional comments where **Feelings** come in or **key debates**

1. BOUNDARIES AROUND KNOWLEDGE

Breadth (B1: Content quantity / Volume, topics, modules) – B8: What do I learn and B7: How much do I understand it?

Depth / Detail - B8: What do I learn and B7: How much do I understand it?

B2: Gaps in knowledge; B3 / B8: Partial understanding

Stuckness and Liminal spaces

2. Deep vs surface (35) **Debate**

5. Managing uncertainty, gaps in knowledge (32) Feelings

6. Exam topics drive-focus learning (30) 6. Detail vs time (30)

6. Need to cover everything (30) 6. Can't know or understand everything (30)

8. Learning for exams vs learning for work-life (26)

8. Exam experience guides depth-detail (26)

9. Selective study (25)

9. Connections between and within topics (25)

10. Note-making techniques to organise-simplify (24)

11. Ability to distinguish key facts (22)

11. Moving between detail and big picture (22)

14. Grouping and condensing (16)

16. Open essays difficult (what content, what structure?) (8) Challenge

16. Accepts less depth with physics, maths (8)

18. Focusing on learning things which are interesting (4)

19. Focusing on some subjects or all (2)

20. Judging relevance to argument, task, criteria (1)

2. BOUNDARIES AROUND TIME (/ Space?)

Assessment is time bound (written Exams, practical assessments, written work)

Time over each term and over the year and from year to year.

Student's own time pressures and time management

1. Prioritising (36)

3. BOUNDARIES AROUND SELF AND OTHERS (Brookfields 4 lenses?) Own reflection, Other students, lecturers, staff in placement, the

literature (Books, internet)
e.g. Control, own decision making; Independence

3. Control, own decision making (34) **DEBATE**

7. Boundary forced, not chosen (29) **DEBATE**

8. Independence vs support from others (26) **DEBATE**

10. Uses lecturer guidance (24)

12. Friends, family, commitments define boundaries (20) **DEBATE**

16. Negotiating commitments (8)

20. Uses year 3 students for guidance (1)

4. BOUNDARIES AROUND WAYS OF THINKING AND BEHAVING (attitudes, expectations, perceptions, motivations, views on learning, qualities, skills, behaviours)

4. Big picture view (33)

6. Understanding own limits (30)

10. Good radiographer vs good student (24)

11. Moving between different tasks & feelings (22)

12. Judgements take skill & thinking time (20)

13. Knowing when to give up (17)

15. Short-term nature of stress (14)

17. Balancing self-criticism and motivation, reward (7)

Appendix 17: Table showing coverage of boundary categories for each student

Student Interview	Boundaries areas (existing and new ones added)	Good examples
Dennis Int 1	B1: Content quantity / volume (Challenge) B2: Gaps in Knowledge B3: Difficulty with uncertainty (in context of placement) B5: Boundaries in context of written assignment (Content, breadth, depth, style)	Boundaries around knowledge
	B4: Boundaries around time and stress levels	Boundaries around time and stress levels
Dennis Int 2	B6: Shifting the boundaries of his thinking	Boundaries around thinking
Louise Int 1	B4: Boundaries around time and stress levels B5: Boundaries in the context of a written assignment B7: Boundaries around Understanding – shifting from relying on memory to understanding (deep vs surface?) Boundaries around knowledge (B2: Gaps in knowledge, partial understanding, B3: Difficulty with uncertainty in context of exams and placement) Liminal Space / stuckness Boundaries around knowledge (B1: Content quantity / volume) Boundaries around Knowledge (B8: What do I learn?) Use of various boundary type strategies. B9: Expanding boundaries around achievements / expectations in relation to knowledge and skills Big picture attitude B10: Boundaries around self and others	Good example of B7, examples of liminal space / stuckness Good examples of B8. Very good example of B9 Good example of B10
Louise Int 2	B6: Boundaries around thinking, B11: Boundaries around behaviours Boundaries around knowledge (B3: difficulties with uncertainty in context of project assessment) Boundaries around knowledge (B3: Managing uncertainty)	Good example of changes in thinking B6 and behaviours B11
Liesje Int 1	B4, B2, B7, B6 B11 Liminal space / stuckness B10, B1, Learning preferences, B4: B3: B8: B9, B3: difficulty / managing uncertainty in context of exams,	Good example of B2: gaps in knowledge and B7: understanding, B10: boundaries around self and others re maths issue Good example of different learning
Liesje Int 2	B4, B9, B2: B7: Liminal space / stuckness B4, B10, B1, B3: Difficulty / managing uncertainty in context of exams, B8,	

	learning preferences – how I learn? B11, B3: managing uncertainty in context of placement, B9, B3: Difficulty / managing uncertainty B5: in context of written assignments.	preferences and managing time / stress and expectations / achievements around written assessments and exams.
Alya Int 1	Boundaries around knowledge (B1: B2: B3: difficulty / managing with uncertainty in context or revision / exams, B8: what do I learn), (B3: difficulty / managing uncertainty in context of placement), B4: B6: B7: B9: B10: B11: (New) Boundaries around knowledge (B12: Boundaries around big picture and detail, i.e. breadth and depth.	Good example of Maths as a **straightforward element**. Good example of Boundaries around knowledge (B12: big picture and detail). B7: Liminal space / stuckness re MRI Good example of importance of B10: others, emerging independence and changes in B11: behaviours and B6: thinking Big picture.
Alya Int 2	Boundaries around knowledge (B1: B3: difficulty / managing uncertainty in context of revision / exams, B3: difficulty / managing uncertainty in context of placement), B3: difficulty / managing uncertainty in context of written work, B8: B12) B4: B5: B6: B7: B9: B10: B11: B12:	
Lucy 2 Int 1	Boundaries around knowledge (B1: B2: B3: Difficulty with uncertainty in written exams / / assignments/ partial understanding, B8:) B4: B6: B7: Liminal space / stuckness B9: B10: B11:	Mature student – good example of the influence of background knowledge and previous experience on challenges, boundaries and strategies. Relevance important.
Lucy 2 Int 2	Boundaries around knowledge (B1: B2: B3: Difficulty with / managing uncertainty in written exams / partial understanding, B3: Difficulty with uncertainty in placement / practical assessments), B8: What do I learn?), B4: B7: B9: B10: B11:	
David Int 1	Boundaries around knowledge (B1: Content quantity / volume, B2: Gaps in knowledge, B3: Difficulty with / Managing uncertainty in context of exams / written assignments Risk taking, managing uncertainty partial understanding, difficulty with uncertainty in context of placement, B8: What do I learn?), B4: Boundaries around time and stress levels, B7: Boundaries around understanding **Straighforward things**. Lack of liminal space / stuckness, moves through quickly? B9: Boundaries around achievements / expectations, B10: Boundaries around self	Mature student **Straightforward elements** Good example of working alone. Good example of managing uncertainty / liminal space.

	and others, B11: Boundaries around behaviours, B12: Boundaries around big picture and detail	
David Int 2	Boundaries around knowledge (B1: Content quantity / volume, B2: Gaps in knowledge, B3: Difficulty with / Managing uncertainty in context of exams / written work Risk taking, in context of placement/practical assessments, managing partial understanding / uncertainty in written assignments, B8: What do I learn?), B4: Boundaries around time and stress levels, B7: Boundaries around understanding, Managing liminality, B9: Boundaries around achievements / expectations, B10: Boundaries around self and others, B11: Boundaries around behaviours. B12: Boundaries around big picture and detail.	
Aniri Int 1	Boundaries around knowledge (B1: Content quantity / volume, B2: gaps in knowledge / managing gaps in knowledge, B3: Difficulty with / managing uncertainty / partial understanding, difficulty with / managing uncertainty in context of groupwork, written work, exams, B8: What do I learn?), B4: Boundaries around time and stress levels, B7: Boundaries around understanding, **straightforward things** Challenges with and Managing liminality. B10: Boundaries around self and others, B11: Boundaries around behaviours. B12: Boundaries around big picture and detail.	**Straightforward things** Interesting strategies for study and time / stress management. 2nd interview: Good example of changes in thinking, imp of reflection, ways of managing detail and big picture.
Aniri Int 2	Boundaries around knowledge (B1: Content quantity / volume, B2: Gaps in knowledge, B3: Difficulty with / managing uncertainty / partial understanding, in context of exams, in the context of placements / practical assessments, B8: What do I learn?), B4: Boundaries around time and stress levels, B6: Boundaries around thinking / Shifting the boundaries of thinking, Importance of reflection, B7: Boundaries around understanding, Managing liminality. B9: Boundaries around achievements / expectations, B10: Boundaries around self and others. B11: Boundaries around behaviours, B12: Boundaries around big picture and detail.	
Jane Int 1	Boundaries around knowledge (BI: Content	

	quantity / volume, B2: Gaps in knowledge, B3: difficulty / managing uncertainty in the context of exams / partial understanding, managing uncertainty in the context of written work **straightforward thing**, B8: What do I learn?), B4: Boundaries around time and stress levels, B7: Boundaries around understanding liminality / stuckness, managing liminality / stuckness, B9: Boundaries around achievements / expectations, B10: Boundaries around self and others, B11: Boundaries around behaviours, B12: Boundaries around big picture and detail.	Example of changes in expectations and managing achievements / failures etc.
Jane Int 2	Boundaries around knowledge (B1: Content quantity / volume, B2: gaps in knowledge, B3: difficulty / managing uncertainty / partial understanding in the context of exams, difficulty / uncertainty in the context of placement / practical assessments, difficulty / uncertainty in context of written work, B8: What do I learn?), B4: Boundaries around time and stress levels, B6: Shifting boundaries around thinking, B7: Boundaries around understanding, B9: Boundaries around achievements / expectations, B10: Boundaries around self and others, B11: Boundaries around behaviours. B12: Boundaries around big picture and detail	
Tegan Int 1	Boundaries around knowledge (B1: Content quantity / volume, B3: Difficulty with / Managing uncertainty in context of exams), B4: Boundaries around time and stress levels, B9: Boundaries around achievements / expectations, B10: Boundaries around self and others, B11: Boundaries around behaviours.	Not a great deal included here, so there may be other boundary issues under other codes, or things I've missed? Example of changing boundaries around self and others and becoming more independent re time / stress management.
Tegan Int 2	Boundaries around knowledge (B1: Content quantity / volume, B2: Gaps in knowledge, B3: Difficulty with / Managing uncertainty in context of exams, difficulty with / Managing uncertainty / partial understanding, in context of written assignments, B8: What do I learn?), B7: Boundaries around understanding, B9: Boundaries around achievements / expectations, B10: Boundaries around self and others, B11: Boundaries around behaviours, B12: Boundaries around big picture and detail	

Matilda Int 1	Boundaries around knowledge (B1: Content quantity / volume, B2: Gaps in knowledge, B3: Difficulty with uncertainty / partial understanding in context of exams, B8: What do I learn?), B4: Boundaries around time and stress levels, B6: Boundaries around thinking / shifts, B7: Boundaries around understanding, B9: Boundaries around achievements / expectations. B10: Boundaries around self and others, B11: Boundaries around behaviours, B12: Boundaries around big picture and detail	Mature student. Good example of difficulties with volume of work, wanting to understand, managing time and stress and having to compromise re exam learning. **Straightforward elements** / confidence relating to written work. Good example of **spiky profile** (Cottrell 2013a; Happé and Frith 1996)
Matilda Int 2	Boundaries around knowledge (B1: Content quantity / volume, B2: Gaps in knowledge, B3: Difficulty with / Managing uncertainty / partial understanding, in context of exams, B8: What do I learn? B3: Managing uncertainty in context of written assignments **straightforward element**, B4: Boundaries around time and stress levels, B6: Boundaries around thinking / shifts, B7: Boundaries around understanding, B9: Boundaries around achievements / expectations, B10: Boundaries around self and others, B11: Boundaries around behaviours, B12: Boundaries around big picture and detail	
Gloria Int 1	Boundaries around knowledge (B1: Content quantity / volume, B2: Gaps in knowledge, B3: Difficulty with / Managing uncertainty / partial understanding, in context of exams – Liminal space, Difficulty with / Managing uncertainty in context of written work – Liminal space, B3: Managing uncertainty in context of placement, B8: What do I learn?), B4: Boundaries around time and stress levels, B6: Boundaries around thinking / shifts, B7: Boundaries around understanding. B9: Boundaries around achievements / expectations, B10: Boundaries around self and others, B11: Boundaries around behaviours, B12: Boundaries around big picture and detail**.**	Good example of someone with meta-thinking skills, attitudes, behaviours / strategies for when she gets stuck or doesn't understand, managing liminal space. Also had good background knowledge for large parts of the course along with managing transition issues well. Is example of Successful student but also a **spiky profile** (Cottrell 2013a; Happé and Frith 1996) Int 2: Good example of shifts in thinking and someone who is very engaged as well as being very strategic.
Gloria Int 2	Boundaries around knowledge (B1: Content quantity / volume, B2: Gaps in knowledge, B3: Difficulty with / Managing uncertainty / partial understanding, in context of exams, in context of written work, B8: What do I learn?), B4: Boundaries around time and stress levels, B6: Boundaries around thinking / shifts, B7: Boundaries around understanding, B9: Boundaries around achievements / expectations, B10:	

	Boundaries around self and others, B11: Boundaries around behaviours, B12: Boundaries around big picture and detail**.**	
Darryl Int 1	Boundaries around knowledge (B1: Content quantity / volume, B2: Gaps in knowledge, B3: Difficulty with / Managing uncertainty / partial understanding, Liminal space / stuckness, in context of exams, B8: What do I learn?), B4: Boundaries around time and stress levels, B6: Boundaries around thinking / shifts, B7: Boundaries around understanding, B9: Boundaries around achievements / expectations, B10: Boundaries around self and others, B11: Boundaries around behaviours,B12: Boundaries around big picture and detail**.**	Liminal space / stuckness with maths. Strong use of others. Lots of stress factors and resilience. Shifts in behaviours and thinking.
Darryl Int 2	Boundaries around knowledge (B1: Content quantity / volume, B2: Gaps in knowledge, B3: Difficulty with / Managing uncertainty / partial understanding in context of exams, in context of written work, in context of placement, B8: What do I learn?), B4: Boundaries around time and stress levels, B6: Boundaries around thinking / shifts, B7: Boundaries around understanding, B10: Boundaries around self and others, B11: Boundaries around behaviours, B12: Boundaries around big picture and detail**.**	Deep / surface learning. Mixed strategy use, effective not so effective. Own ways of doing things, selective study. Big picture think, particularly with work / future. Increasing engagement and maturity.
Julie Int 1	Boundaries around knowledge (B1: Content quantity / volume, B2: Gaps in knowledge, B3: Difficulty with / Managing uncertainty in context of exams, in context of written work, B8: What do I learn?), B4: Boundaries around time and stress levels, B6: Boundaries around thinking / shifts, B7: Boundaries around understanding, Transition, B9: Boundaries around achievements / expectations, B10: Boundaries around self and others, B11: Boundaries around behaviours, B12: Boundaries around big picture and detail**.**	Big picture thinking, good example of previous experiences of learning. **Spiky profile** (Cottrell 2013a; Happé and Frith 1996), **Straightforward things** and struggles
Julie Int 2	Boundaries around knowledge (B1: Content quantity / volume, B2: Gaps in knowledge, B3: Difficulty with / Managing uncertainty / partial understanding, in context of exams– Liminal space, in context of placement, **straightforward element (maths),** B8: What do I learn?), B4: Boundaries around time and stress levels, B6: Boundaries around thinking / shifts, B7: Boundaries around understanding, B9: Boundaries around achievements / expectations, B10: Boundaries around self and others, B11: Boundaries around behaviours, B12:	Good example of changes in learning strategies and developing independence

	Boundaries around big picture and detail.	
Lucy 1 Int 1	References 1-12 - 30.94% Coverage Boundaries around knowledge (B2: Gaps in knowledge, B3: Difficulty with / Managing uncertainty / partial understanding – Liminal space, in context of exams Transition, in context of written work, in context of placement, B8: What do I learn?), B6: Boundaries around thinking / shifts, B7: Boundaries around understanding, B9: Boundaries around achievements / expectations, B10: Boundaries around self and others, B11: Boundaries around behaviours, B12: Boundaries around big picture and detail.	Example of someone mainly interested in the job and not so much in the wider knowledge. Someone who has made changes in their behaviour after previous disappointments, less about changes in thinking?
Lucy 1 Int 2	Boundaries around knowledge (B1: Content quantity / volume, B2: Gaps in knowledge, B3: Difficulty with / Managing uncertainty / partial understanding in context of exams, in context of placement, in context of written work, B8: What do I learn?), B4: Boundaries around time and stress levels, B6: Boundaries around thinking / shifts, B7: Boundaries around understanding, B9: Boundaries around achievements / expectations, B10: Boundaries around self and others, B11: Boundaries around behaviours, B12: Boundaries around big picture and detail.	
Ruby Int 1	Boundaries around knowledge (B1: Content quantity / volume, B2: Gaps in knowledge, B3: Difficulty with / Managing uncertainty in context of exams, Liminal Space, stuckness, in context of placement, in context of written work, B8: What do I learn?), B4: Boundaries around time and stress levels, B6: Boundaries around thinking / shifts, B7: Boundaries around understanding, Straightforward things B9: Boundaries around achievements / expectations, B10: Boundaries around self and others, B11: Boundaries around behaviours, B12: Boundaries around big picture and detail.	Example of someone generally managing. Has experience not doing so well and picks herself up from this e.g. at AS and 40% exam mark. Examples of strategies for dealing with getting stuck. Becoming more independent.
Ruby Int 2	Boundaries around knowledge (B1: Content quantity / volume, B3: Managing uncertainty in context of exams, in the context of written work, in the context of placement, B8: What do I learn?), B4: Boundaries around time and stress levels, B6: Boundaries around thinking / shifts, B7: Boundaries around understanding, B9: Boundaries around achievements / expectations, B10:	

	Boundaries around self and others, B11: Boundaries around behaviours, B12: Boundaries around big picture and detail.	
Frances Int 1	Boundaries around knowledge (B1: Content quantity / volume, B2: Gaps in knowledge, B3: Difficulty with / Managing uncertainty / partial understanding in context of exams, Liminal space, , in context of written work, in context of placement, B8: What do I learn?), B4: Boundaries around time and stress levels, B6: Boundaries around thinking / shifts, B7: Boundaries around understanding, B9: Boundaries around achievements / expectations, B10: Boundaries around self and others, B11: Boundaries around behaviours, B12: Boundaries around big picture and detail.	Mature student, generally coping and doing well. Good example of moving through difficulties. Shifts in thinking, expectations and behaviours.
Frances Int 2	Boundaries around knowledge (B1: Content quantity / volume, B2: Gaps in knowledge, B3: Difficulty with / Managing uncertainty / partial understanding in context of exams, in context of placement, in context of written work, B8: What do I learn?), B4: Boundaries around time and stress levels, B6: Boundaries around thinking / shifts, B7: Boundaries around understanding, B9: Boundaries around achievements / expectations, B10: Boundaries around self and others, B11: Boundaries around behaviours, B12: Boundaries around big picture and detail.	

Appendix 18: Certificate of ethical research approval

MSc, PhD, EdD & DEdPsych theses

[redacted]

Certificate of ethical research approval

MSc, PhD, EdD & DEdPsych theses

To activate this certificate you need to first sign it yourself, and then have it signed by your supervisor and finally by the Chair of the School's Ethics Committee.

For further information on ethical educational research access the guidelines on the BERA web site: http://www.bera.ac.uk/publications and view the School's Policy online.

READ THIS FORM CAREFULLY AND THEN COMPLETE IT ON YOUR COMPUTER (the form will expand to contain the text you enter)**. DO NOT COMPLETE BY HAND**

Your name: Rachel Canter

Your student no: [redacted]

Return address for this certificate: [redacted]

Degree/Programme of Study: EdD (Generic route)

Project Supervisor(s): Dr. Gill Haynes and Dr. Nadine Schaefer

Your email address: [redacted]

Tel: [redacted]

I hereby certify that I will abide by the details given overleaf and that I undertake in my thesis to respect the dignity and privacy of those participating in this research.

I confirm that if my research should change radically, I will complete a further form.

Signed: [redacted] **date: 17th July 2013**

Certificate of ethical research approval

TITLE OF YOUR PROJECT:

An exploration of students' experience of challenge, difficulty and stuckness in Higher Education

1. Brief description of your research project:

The project aims to explore students' experience in Higher Education of challenge, difficulty and stuckness in the context of their academic study. I am drawing on both Educational and Psychological perspectives to explore what is meant by difficulty and stuckness, what might trigger these experiences and how individuals respond to and manage these experiences in educational settings. The project will take a case study approach, collecting primarily qualitative data through interviews, observations, email conversations and analysis of participants' written work.

2. Give details of the participants in this research (giving ages of any children and/or young people involved):

The participants will be drawn from the second year cohort (academic year 2013-14) of [redacted] students within the College of [redacted] at the University of [redacted]

As far as is known at this stage all students will be over the age of 18.

Give details (with special reference to any children or those with special needs) regarding the ethical issues of:

3. <u>Informed Consent:</u>

Recruiting participants to the study will follow the process below:

i. The [redacted] department has agreed to timetable a half hour slot attached to a core second year lecture in the first or second week of term (exact date to be confirmed). This will give me the opportunity to speak to all the second year students. I will explain the rationale for the project and provide some basic information about their potential involvement. All students will be given a handout (see appendix 1.) which will be explained fully and students will have the opportunity to ask any questions.

   They will be asked to voluntarily complete a short form expressing an interest in becoming a participant and giving their agreement for me to contact them (see appendix 2). I will also explain that the next step would be for me to meet those who have expressed an interest in a small group, or individually if they would prefer to remain anonymous to their peers (see tick box option on appendix 2).

ii. At the follow-up meeting I will explain the research project and their involvement in more detail as well as explaining information about anonymity, confidentiality and informed consent. At this stage they can

sign the consent form at the meeting, take it away and return it at a later agreed date, or decide not to be involved in the project. (For the participant consent form - see appendix 3).

I have also obtained consent from the Head of [redacted] (See appendix 4).

4. <u>Anonymity and Confidentiality</u>

The following steps will be taken to protect the confidentiality and anonymity of the participants:

i. Student interviews will take place in the [redacted] interview rooms, which are a neutral central space outside the students' department, where students are coming and going for many different types of meetings.

ii. In my job role if I come into contact with participants in another public context at the University, I will not instigate a conversation which might identify them as part of the project.

iii. All data collected as part of the study will be stored securely - see section 7.

iv. In any documents which form part of the thesis write-up and may therefore be shared with a third party, participants will be referred to using pseudonyms.

v. Every reasonable effort will be made to ensure that no output from the research (e.g. audio recordings from interviews, transcribed interviews, researcher notes, correspondence with participants, researcher presentations, articles / papers) will provide information which might allow any participant or institution to be identified from names, data, contextual information or a combination of these.

vi. The confidentiality of student information will remain confidential unless the researcher has a concern that the student may harm themselves or another individual. In this case I will inform the student of any appropriate University support services such as their personal tutor, the counselling service or the Student [redacted] and encourage them to seek support.

5. Give details of the methods to be used for data collection and analysis and how you would ensure they do not cause any harm, detriment or unreasonable stress:

The data collection methods and the frequency of the data collection will be discussed in detail with each participant before they consent to taking part in the project.

<u>Individual student interviews</u>

There will be 2 main interviews conducted in term 1 and term 3. As these are busy times for the students care will be taken to find times which are suitable for the students.

At the start of each interview the following issues will be discussed with the student and time given for them to ask any questions or share any concerns:

- the general areas to be discussed in the interview
- the ethics surrounding the recording of the interviews, storage and use of the data
- the interview process i.e. options for a student to take a break, ask questions etc.

All interviews will be recorded, unless a participant prefers not to be recorded, in which case handwritten notes will be taken. Audio data will be downloaded from recording devices at the earliest possible opportunity, and then deleted from those devices and stored as detailed in section 7 below.

Observations
It might be useful for me to sit in on some lectures or seminars to gain detailed information about the material being studied. In this situation I will get the permission of the lecturer and s/he or I will explain my presence to the students at the start of the session.

Email correspondence
As the aim of the study is to understand students' experience of challenge, difficulty and stuckness it will be important to track how they are feeling about their academic studies as they progress throughout the year. Students will therefore receive an email at particular intervals (4 times a term) which will require a quick response. There will be an option for students to add some additional comments, but this is not required. Students will not be put under any pressure to give detailed responses. This data will then be discussed in the interviews. Data from email correspondence will be copied to files stored securely and then deleted from the email system at the earliest opportunity.

Analysis of student's written notes or assignments
This will only be part of an individual case study if it is likely to clarify or add information discussed in interviews or emails. This will be discussed fully with the students at the introductory meetings. Any assignment work which participants have agreed can be used as part of the research data will be anonymised and stored securely as detailed in section 7.

All students will be offered the opportunity to view copies of the interview transcripts or completed case studies to make sure they are happy with the researcher's interpretations.

6. Give details of any other ethical issues which may arise from this project - e.g. secure storage of videos/recorded interviews/photos/completed questionnaires

All electronic data collected as part of the research project (audio files, interview transcripts, researcher notes, email correspondence) will be stored in my University password protected account, which is backed up by the University regularly. Whilst completing transcription or analysis, documents will be stored temporarily on a personal computer. These will then be removed and stored as above at the end of the working day.

Paper-based data (e.g. signed consent forms or any documents which match pseudonyms to real names will be stored in a locked filing cabinet.

7. Special arrangements made for participants with special needs

At the initial meeting each individual participant will be asked if they have any specific needs relating to their involvement in the project. Any information that they choose to share will be discussed in confidence with them. Reasonable steps will be taken to meet these needs. For example, interview rooms are fully accessible for those with physical disabilities and paperwork such as consent forms can be provided in large text or discussed in greater detail if needed.

8. Give details of any exceptional factors, which may raise ethical issues (e.g. potential political or ideological conflicts which may pose danger or harm to participants):

Ethical Issues arising from my job role as an Academic Skills Adviser based at the University of [redacted]

Given the nature of the research questions, students will be discussing the challenges they are experiencing as part of their academic studies. If I become aware that students are in particular difficulty, or are stressed about their studies, I will make them aware of the University Services which are available to support them, including the role of their personal tutor.

If any of the participants require an appointment with an Academic Skills Adviser I will refer them to one of my three colleagues. I will therefore not see individual participants in my job role for the duration of the research project.

If students disclose information about any staff member at the University, this will remain confidential. If this information involves a possible breach of the University's 'Code of Professional Conduct: relations between staff and students/between staff' http://www.[redacted] ac.uk/staff/employment/academicroles/policies/relations/ - the researcher will take advice from their line manager and supervisor without naming the student and staff member involved.

If points need to be made in the write-up which refer to the role of University staff, or the structure of the programme, care will be taken to make the points constructively and not to identify individual members of staff.

It is hoped that the findings from the research project will be of use to future students, my colleagues in the [redacted] team and the [redacted] department. Any future use of the data which forms part of the published thesis, in relation to meetings, presentations or reports will adhere to the same ethical principles as outlined in this proposal.

***This form should now be printed out**, signed by you on the first page and sent to your supervisor to sign. Your supervisor will forward this document to the School's **Research Support Office** for the Chair of the School's Ethics Committee to countersign. A unique approval reference will be added and this certificate will be returned to you to be included at the back of your dissertation/thesis.*

***N.B**. You should not start the fieldwork part of the project until you have the signature of your supervisor*

This project has been approved for the period: **until:** July 2016

By (above mentioned supervisor's signature): G S Haynes **date:** 17/7/2013

N.B. To Supervisor: *Please ensure that ethical issues are addressed annually in your report and if any changes in the research occur a further form is completed.*

GSE unique approval reference: D/12/13/38

Signed: NR Rm **date:** 24/7/13

Chair of the School's Ethics Committee

Chair of the School's Ethics Committee
updated: March 2013

Appendix 19: Initial analysis of challenges coded in the data through NVivo

I coded 63 sources, 32 interviews (two per student) and 31 emails

Academic Challenges (Codes)	**No. of sources where this was coded**	**No. of students where this was coded**
Challenges related to exams and revision	59 of the 63 sources.	All 16 students
Time Management	43	16
Volume / quantity of content	41	16
Liminal space - stuckness	30	16
Teaching issues	29	14 (not Dennis or Tegan)
Partial-fragmented understanding	29	15 (not Dennis)
Understanding difficult concepts	26	15 (not Matilda)
Writing	23	15 (not Matilda)
Unsure of learning approaches	19	9
Strategy use and timing	18	12
Not understanding task complexity or difficulty	17	10
Knowledge fragile	16	10
Note-making	15	12
Studying with others	15	10
Committing things to memory	13	8
Lack of subject-knowledge background	11	
Groupwork	10	8
Lectures difficult	6	4 (Julie, Liesje, Tegan, Lucy2)
Cultural-language differences	2	Lucy2 in both interviews
Transferring knowledge to paper	1	Lucy2
Challenges associated with feelings, attitudes, skills, expectations	58 of the 63 sources Need to break this down into the various components	All 16 students.
Personal-social-health challenges	35 of the 63 sources	15 (not David)
Challenges (financial, paid work, future study)	15 of the 63 sources	9 of 16 students

Appendix 20: Levels of perceived challenge and management of challenge (taken from email questionnaires)

Email 1 sent midway through term 1 (30th October) - 11 of the 16 students responded.

Email 2 sent in term 2 (12th January) at the start of the students' placement – 11 of the 16 students responded.

Email 3 sent later in term 2 (3rd March) during the students' placement – 9 of the 16 students responded.

	Term 1 email 1								**Term 2 email 2**								**Term 2 email 3**							
	Not → Very Challenging				Managing → Not managing				Not → Very Challenging				Managing → Not managing				Not → Very Challenging				Managing → Not managing			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Dennis			■			■					■			■					■			■		
Liesje											■			■										
Alya				■		■						■		■					■			■		
Lucy 2				■		■						■		■					■			■		
David			■				■																	
Aniri				■			■				■				■				■			■		
Jane				■			■					■			■									
Tegan			■				■				■				■			■					■	
Matilda				■			■			■				■										
Gloria		■			■				■				■				■					■		
Darryl				■			■				■			■					■			■		
Ruby				■			■				■				■				■				■	
Francis																			■			■		
Lucy1																								
Julie																								
Louise																								

Appendix 21: Initial analysis of feelings coded in the data through NVivo and chosen by students in email responses

I coded 63 sources, 32 interviews (two per student) and 31 emails

Feeling	**No. of sources where this was coded at least once**	**No. of students where this was coded at least once**	**No. of students who chose this feeling**		
	(out of 63 sources)	**(Out of 16 students)**	**Term 1 email 1 (out of 11 responses)**	**Term 2 email 2 (out of 11 responses)**	**Term 2 email 3 (out of 9 responses)**
Pressure	44	15	10	7	4
Positive	35	15			
Worry	33	14			
Confident	27	16		1	1
Struggle	27	14	7	2	2
Feels behind	27	10			
Stressed	24	12	8	5	6
Low Confidence	22	12			
Frustrated	21	12			
Motivated	19	11	4	6	5
Overwhelmed	16	8	7	4	2
Unsure, scared	14	9			
Interested	11	10	4	7	5
Tired	9	6	7	9	8
Panicked	8	7			
Focused	8	6	2	4	3
Feels relentless	8	5			
Annoyed	6	4			
Angry	2	1			
Bored	1	1	2	1	1
Stuck			1	1	
Involved			1	5	4
Relaxed					1
Enthusiastic			2	5	4

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