



The University of  
**Nottingham**

**Students' Experiences of Academic Play within Transitional Space  
in Higher Education**

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**Thesis submitted to the University of Nottingham  
for the degree of Doctor of Philosophy**

**June 2011**

## **Abstract**

This thesis argues that Donald Winnicott's theory of transitional space and play casts new light upon the ontological dimensions of students' experiences of transition within Higher Education. Winnicott enables the illumination of the different ways that students might react, cope and personally develop when faced with similarity, difference and change, demonstrating this can have powerful influences upon the facilitation and hindrance of individuals' transitions.

The qualitative case study, conducted at a Russell Group University, involves an in-depth exploration of eight second-year undergraduate Biological Science students' transitional journeys during their study of one module. The students' study included designing their own experiments, working with others, presenting orally, analysing their data and individually writing a scientific report, as part of a creative group project. I argue throughout this thesis that this module invited learners to engage in adult, transitional academic play spaces. Here, learners had the freedom to risk putting him or herself into relation with sameness, uncertainty, difficulty, challenge and change.

The study reports that the potential and enjoyment of transition, as Winnicott proposed, might be only fully realised when the conditions are 'good enough' in the mind of the learner. This involves achieving a delicate balance between firstly, the provision of a teaching and learning environment that provides the freedom and opportunities to engage with transition and secondly, the capacities of students to engage with change which might include, toughness, resilience and a will to learn.

In the light of the empirical findings it is argued that students' transitional journeys are both idiosyncratic and complex and students emerge in different ways. It is found that at this stage in their degree study all students required the sensitive support of teaching staff in order to have the confidence to engage within transitional space.

## **Acknowledgements**

I express my most sincere gratitude to my principle supervisor Dr Monica McLean for her valuable support and constant hard work, helping me through my PhD journey. I would also like to thank Professor Roger Murphy for his guidance at the start and end of my studies.

I am indebted to all my family. In particular, Harry (Big 'H'), Cath, Mark, Lexi and Isaac, for their constant love, unconditional support and patience.

I would also like to thank the ESRC for funding my studies and Emma Rowlett the disability advisor at the University of Nottingham for helping me make the submission of my thesis possible.

Throughout my study I have been fortunate enough to make some lovely friends. I am grateful to Jackie for sharing lunch and chats and to Paola for our famous writing groups.



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## Chapter 1

### Introduction

This thesis provides an in-depth exploration of the experiences of eight undergraduate Biological Science students, who were faced with different transitions during their study of one module at the start of their second-year. The ideas of the psychoanalyst Donald Winnicott (1896-1971) about transitional space and play provide the overarching theoretical framework for the case study which sheds new light upon the hitherto overlooked, ontological dimensions of learners' experiences of transition within Higher Education (HE) (Ecclestone, 2009; Ecclestone *et al.*, 2010; Karousou, 2010).

The thesis, as far as I am aware, is the first empirical case study to use Winnicott's ideas as a lens to examine the personal experiences of transition of individual undergraduate students as they move within and between different levels of their degree course. The aim of the study therefore, is to contribute to our knowledge about the notion of the student in transition in HE by illuminating how they might react, cope and develop, when faced with different transitions during their study of a module that might present them with sameness, difference, change, uncertainty and difficulty.

I now examine the origin and development of this study, followed by an outline of the thesis structure.

## **1.1 The origin and development of the research**

The focus of the research is on the discipline of the Biological Sciences, the subject I studied, as a mature, distance learner at the Open University, for my Bachelor of Science Honours Degree. I opted for Biological Sciences because I became increasingly interested in the subject during my first-year Foundational Studies. I went on to study modules concerning brain and behaviour, neurobiology and evolution, to name but a few. I found the academic work challenging, but also fascinating, undertaking my studies with passion and relish.

During and following my undergraduate study I worked in a Comprehensive School as a Biology Technician. My role involved working closely with A-level students, aiding them with their laboratory work. One aspect of their course involved students designing, for the first time, their own experiments based upon one of two topics; photosynthesis or enzymes. This involved the students organising the equipment to conduct their experiment and spending two, one-hour sessions informally planning and creating their experiment, before formally conducting it under examination conditions.

In my role, I observed that most students expressed greater interest in studying enzymes, with few choosing photosynthesis. In addition they showed various levels of enthusiasm for designing their own experiments, in which some were more dedicated than others. I also saw the difficulties this project caused for both staff and students. For example, by working one-to-one with individual students I discovered that the students coped with difficulty in different ways. To illustrate, some students asked me to help them set up and conduct their experiments during lunch breaks or

after school, where they required a lot of reassurance and support. Others asked me questions, and were more independent when conducting their experiment. Overall, this project caused anxiety and uncertainty for students. Consequently, staff were required to commit a lot of time supporting the students, not only with their laboratory work, but also with their data analysis and project report. When a new member of staff became Head of the Biology Department, the decision to change<sup>1</sup> to a different Awarding Organisation was made, because it was viewed that the workload involved was too much for the staff to sustain. Yet, while this move was helpful for staff, two staff members told me of their concerns, stating that now this project had been removed, students might not be adequately prepared for university laboratory classes.

My experience of helping post-16 students with their laboratory work and observing their different interests, enthusiasm and various difficulties, plus my personal experiences as an undergraduate Biological Science student, led me to become interested in how different students coped when undertaking academic tasks and what helped students to be successful in their studies. My attention also moved to the experiences of undergraduate students. These ideas formed the basis of my dissertation required for my study of a Masters Degree (MA) in 'Research Methods in Education'. This involved a qualitative case study that explored the pedagogic experiences of individual Biological Science students during their first-year at university, including their studies within the laboratory. Yet this work was still very broad, and at the start of my PhD study I developed my ideas further, gradually narrowing the scope of my research to students' experiences of laboratory classes.

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<sup>1</sup> This decision was made by teaching staff and I was not consulted.

Here I identified a second-year module that bore many similarities to the one that I had assisted A-level students with previously.

My interest also began to grow regarding the notion of the student in transition within Higher Education (HE). A small section of my MA research had examined the students' transitions into university. On further reading of the literature, I realised that the concept of transition could provide new insights into how students cope, progress and change, as well as throw new light on what might facilitate or hinder their movement within HE. However, I encountered problems identifying an appropriate theoretical frame on which to base my study because I found the concepts that I had identified previously within the literature were too narrow and restricted to shed light upon the emerging data. To illustrate, I found that the notion of 'liminal space' (Van Gennep, 1960; Turner, 1969) which is increasingly used within HE to examine students' transitions (see: Meyer and Land, 2003, 2005, 2006; Land *et al.*, 2008; Palmer *et al.*, 2009) did not allow me to view the students as having agency or freedom when faced with transition. Nor did it enable me to shed light upon a number of ontological dimensions of the students' transitions, such as personal interest or boredom. In Chapter 3 'Students' experiences of transition in Higher Education: The theoretical framework', I discuss these limitations and the decisions this led me to take.

By July 2007, ten months into my data collection, I had read more extensively and within the writing by Land *et al.* (2006) I came across references to the work of the psychoanalyst Donald Winnicott (1971). My interest was aroused and I became more familiar with his writing, discovering his notion of transitional space and play. I

found his ideas have been little used by those researching HE in the United Kingdom (UK). A notable exception is the work of Phyllis Creme (2003, 2008) and her colleague Celia Hunt (Creme and Hunt, 2002) who have drawn upon Winnicott in their research into students' transitional writing in learning journals and university students' creative writing, respectively.

By applying Winnicott's ideas I immediately shed new light upon the empirical data. It is the ideas derived from Winnicott that form the basis of this thesis which has the overall objective of examining individual second-year Biological Science students' experiences of transition. The research focuses upon the students' study of a module that involved a laboratory-based project where they encounter specific pedagogic requirements: they create their own experiments, present orally, work with others, analyse data and finally, write independent scientific reports. Initially, I aimed to find out more about how students might progress, cope and change and what might aid or hinder their success. Thus, the starting point of this research had two overarching questions:

*1. What are the experiences of individual second-year Biological Science students when faced with different transitions during their laboratory-based study within Higher Education?*

*2. What might aid or hinder their progression?*

However, these questions were too broad for the scope of a thesis to fully address, so I present more focused subsidiary research questions within Chapter 3 which have

been developed and derived by drawing upon Winnicott's theories and reviewing relevant literature. Below I provide an overview of the thesis as a whole and outline the different chapters within it.

## **1.2 Structure of the thesis**

This introduction has outlined the origins and development of the research study and the overall aims. I have shown that conceptualising students' experiences as transitional might help to achieve that aim. I have also presented the research questions that formed the starting point for this study. In addition, I have highlighted how this thesis might contribute to furthering our knowledge.

In the following two chapters I review the literature. Chapter 2 outlines different contexts within which the case study is located. I set the scene by describing the 'liquid times' (Bauman, 2007) we are living in and the changes through which HE in the UK is going. I then move on to discuss the Biological Sciences and why we need to think about how they are delivered to students. Finally, I discuss how transition has been researched within HE and identify the limitations of that work. In Chapter 3 I move on to present the work of Donald Winnicott and his theory of transitional space and play. This forms the overarching theoretical frame of the thesis. I then connect Winnicott's ideas to more contemporary research within HE. In the light of the literature review, I present the key research questions.

In Chapter 4 'Research design' I highlight the importance of using research methods congruent with the research aims and questions. Here, I argue that a qualitative case study is appropriate and I provide details about the ethical considerations associated

with the conduct of the study, the multiple qualitative research methods undertaken and the data analysis.

In Chapter 5 ‘An introduction to the student cases’, I introduce the reader to the individual student cases. I provide biographic accounts about each student in order to provide a rich, holistic description of the student cases.

In Chapter 6 ‘A potential academic play space: Analysing data and designing experiments’, I outline the module and in so doing, detail the background and delivery of the module. Drawing upon Winnicott’s notion of play (Winnicott, 1971, 1989) I show how his ideas are especially relevant to this module.

In the following four chapters I detail the empirical findings that form the substantive part of the thesis. These chapters show the student cases’ experiences of transition within the different potential academic play spaces that the module provided.

In Chapter 7 ‘Experimental academic play within the laboratory: Becoming a creative experimenter’, I examine the students’ different experiences and responses when moved away from being compliant learners within the laboratory. Previously they were instructed on how to conduct their experiments but the module ADDE invited learners to engage in creative ‘academic play’ (Creme, 2008:49) within the laboratory, where they created their own experiment as part of a group project.

In Chapter 8 ‘Communicative academic play within the laboratory: Becoming a creative group member and scientific presenter’, I focus upon the students’



transitions to work with others and present orally within the laboratory. These transitions involved the students learning in relation to others in order to make connections between their inner knowledge and experimental design. This highlights the social dimension of transitional space where students developed, or did not develop, their 'voice'.

In Chapter 9 'Analytical academic play: Becoming a creative data analyst', I show the students' movement into the disciplinary boundary between Biology and Maths. In so doing I demonstrate how the students played and made connections with different statistical concepts and their experimental design, in order to analyse their quantitative data, forging connections between their experiment and the results it yielded. I show that this transition caused the students most difficulty and presented a disturbingly different 'outer' that is 'not me'.

I then move to Chapter 10 'Scientific report writing as an academic play space: Becoming a creative scientific writer', in which I present the students' experiences of moving into another disciplinary boundary between Biology and English, to write their scientific reports. I illustrate how the students played with different voices and ideas, bringing their previous 'lived' experiences of academic play together with their written scientific report.

In the final chapter, 'Students' experiences of academic play: The transitional journeys', I bring together the students' experiences reported in previous chapters, to provide a profile of the students' different transitional journeys. I report that individual students emerge in different ways from the experience, and that at this

stage of their degree study all students require sensitive support in order to realise the potential offered by transitional space and play. I then present my conclusions, including an outline of the implications of the study for Higher Education pedagogy and make recommendations for future research studies within this field.

In the following chapter, I introduce the context of the study.

## **Chapter 2**

### **The context of the study**

My research examines students' experiences of transitions in Higher Education (HE) with the aim of gaining insights into their individual personal and academic development when faced with the uncertainty and change that is integral to university study. It is based on the proposition that a greater understanding of students reported transitional journeys can be gained by setting out particular contexts in which they are situated because these in turn, as I will show, have implications for students' experiences of transition. Within this chapter I set the research in its wider context, by outlining the 'liquid age' (Bauman, 2007) in which we are presently living, and highlight the calls that have been made to prepare university students for living in this time of change. I then examine the changes taking place in HE in the United Kingdom (UK) before discussing Biological Sciences where I suggest there is currently some cause for concern. I conclude by showing how students' transitions in HE have previously been researched and identify some key themes and limitations.

#### **Section 2.1 Transitions in a 'liquid' age**

Transitions are a fundamental aspect of current sociological thinking about the contemporary world (Field *et al.*, 2010). Contemporary sociologists of late modernity for example, Giddens (1984), Beck (1992) and Bauman (2000; 2007) claim that our social structures no longer reside along the fixed and enduring pathways of previous generations. According to Bauman (2007) we have moved from a 'solid' phase of modernity to a 'liquid' modern age (p.1). A characteristic of

this age is that social frames and institutions are fluid and open to change; their shape is changing more rapidly than the time taken to cast and solidify them. Consequently, at the present time individuals do not necessarily have the frames of reference that previously could be relied upon, 'there are no fixed points upon today's social compass' (Ingram *et al.*, 2009:2); this is an age associated with uncertainty and risk (Bauman, 2000; Beck, 1992). This reading of the social context might be a reason why transitions throughout the lifecourse in the UK are now receiving an increased focus of attention by both policy-makers and researchers (Ingram *et al.*, 2009; Ecclestone, 2009; Ecclestone *et al.*, 2010).

Pertinent to this study are the transitions students experience during their study within HE. Set within this wider context, HE is itself experiencing rapid structural change and this has implications for the transitions students might experience.

## **Section 2.2 Systemic changes in Higher Education**

At the present time HE in the UK has been going through a period of rapid and far-reaching change. The most pronounced change has been the move from an elite system where approximately 15% of the population attended, to a mass system where at least 40% will have access (Scott, 1995). It is now considered natural that many more young people should aspire to make the transition to university (Quinn, 2009). The National Committee into Higher Education headed by Sir Ron Dearing was commissioned by the UK government to undertake a report called 'Higher Education in the Learning Society' (NCIHE, 1997) and one key part of the report looked at ways of increasing participation in HE. The implementation of policies aimed at widening participation has led to an increase in the number of entrants from

previously under-represented groups so that the student population has become increasingly diverse. This means that students can no longer be viewed as homogeneous - their diversity being evident in such variables as age on entry, previous experiences, qualifications, socio-economic status, ethnicity and cultural backgrounds. In chapter 5 I introduce the students who took part in this study. I will show that whilst they demonstrate similarities there are some distinct and subtle differences between them.

Underlying this trend of massification within HE is the need to ensure that the UK is able to compete within the global market and this is evident within policy documentation (NCIHE, 1997; DfES, 2002, 2003, 2006). For example, the UK government's White Paper, 'The Future of Higher Education' (*ibid.*:2003) highlights the growing emphasis on the economic benefits of HE for both the individual and society. From a policy perspective therefore, HE is seen as having a fundamental role in not only educating students, but also creating and sustaining a workforce that is able to compete effectively within a global economy. However, also relevant to this study is the call for HE to play its part in preparing students for living in a liquid age, or what Barnett (2000b) calls a 'supercomplex' (p.257) world. All of this has implications for the learning experiences provided by universities, a point I return to later in this section.

As well as an increase in student numbers and their diversity, there have been other significant changes. Student fees now increasingly finance undergraduate courses, with international students providing a large amount of these funds. Students therefore, might not only be seeking a university education, but also value for their

money (Biggs, 2003). As pointed out by Foskett *et al.* (2006) 'consumerism' (p.5) has increased within HE in the UK with students viewing themselves as purchasing a qualification, and consequently anticipating high quality services, including enhanced support for their learning, in return.

Moreover, the introduction of modularisation has changed the organisation of degree programmes in most institutions leading to curricula being structured into 'modular packages' (Barnett and Coate 2005:87). In addition, there has been an increase in the use of technology-based and resource-based learning that has produced marked changes in methods of teaching and learning (Fry *et al.*, 2003). There is also greater emphasis upon the teaching of numeracy, literacy and information technology skills (NCIHE, 1997). Although this can be seen as a direct response to meeting the needs of employers, the development of employability skills could also help to ease the students' transition from HE to the workplace (Oates, 1996; Mackintosh, 1998; Atkins, 1999; Mallia, 2009).

HE is increasingly under public scrutiny and is becoming more open to government intervention. There is also greater interest in enhancing the professional status and quality of teaching and learning in HE (Light and Cox, 2001). The Dearing Report (NCIHE, 1997) outlined initiatives that targeted improving the students' learning experiences. This was manifested in the establishment of two agencies to initiate and support such a change. Firstly, the Quality Assurance Agency (QAA) was set up to monitor standards and safeguard quality within HE. Secondly, the Higher Education Academy (HEA) was established with the aim of furthering quality enhancement in teaching and learning and through it, a commitment to providing on-going support for Subject Centres, formerly known as the Learning and Teaching Support Network

(LTSN) Centres. In 2005 the HEA<sup>2</sup> announced the funding of Centres of Excellence for Teaching and Learning (CETLs) aimed at stimulating improvements in the quality of teaching and learning and the undertaking of pedagogic research. Therefore, HE is now associated with providing 'excellence' (*op.cit.*: 3) and this represents a changing role for teaching staff where they now have greater accountability. That said, some of the government's initiatives to support bottom-up change in teaching, learning and assessment in which there are external objectives is not necessarily problem-free. For example, Abbas and McLean (2003) comment critically about the way their project, financed by the Fund for Development of Teaching and Learning<sup>3</sup>, was encouraged to support 'development' and report 'success in terms of an external agenda' (p.71). However, as 'researchers' (*ibid.*) they were discouraged from questioning if all teaching improvement projects are indeed valuable. This suggests that 'critical compliance is becoming characteristic of the way academic staff comply with external imperatives' (Rowland, 2006:56).

To summarise, UK universities have been undergoing major systemic change and as indicated, this in turn, has implications for the role of HE.

### **The changing role of Higher Education**

The massification of HE and an emphasis on graduate employability have resulted in changing the role of the UK University (Mallia, 2009; Rowland, 2006). Yet, Ronald Barnett (1997, 2000a, 2000b, 2004, 2005, 2007) a prominent critical writer within this field argues that universities now appear to be serving the demands of industry,

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<sup>2</sup> In 2005 the Higher Education Funding Council (HEFCE) established 74 Centres for Excellence in Teaching and Learning (CETLs) (HEA, 2005)

<sup>3</sup> The Fund for Development of Teaching and Learning was set up in 1995 and supported projects that aimed to stimulate developments in teaching and learning in HE (HEA, 2005)

as opposed to meeting the needs of the individual student.

Recently Barnett (2007) has stressed the need to put more emphasis upon what he calls the third 'ontological pillar' (p.7) of HE. Two other dominant pillars are identified as representing knowledge and skills. He argues that by taking this stance it puts 'the student back into the centre of [such] educational thinking' (*ibid.*: 7-8) where focus is placed upon students' personal development such as their dispositions, including for example, persistence and resilience and qualities, such as authenticity and care. It is these ideas that come under the umbrella of what he calls a 'will to learn' (*ibid.*: 7) which provides the 'inner' push to keep the learner engaged in their study, continuing to move and become who she / he wants to be.

Barnett (2007) argues that for students to develop an inner will to learn and hence, become prepared to live in an uncertain age, as discussed in Section 2.1, HE needs to rethink the pedagogies it offers students. He proposes pedagogies that provide learners with 'space' (*ibid.*: 139), where the student has greater freedom to learn could encourage the personal development of learners. However, he warns that the loss of teacher control might cause various tensions, for example a shy student might not be confident to speak out when given the freedom to openly discuss his or her work in a class, and that a teacher might have difficulties sacrificing control. Alternative pedagogies such as this therefore, could present students with different and perhaps difficult transitions to face. Consequently, they could be viewed as 'risky' (*ibid.*:143) by teaching staff and course designers.



Set within this context, this study explores the transitional learning experiences of second-year undergraduate Biological Science students.

### **Section 2.3 The Biological Sciences in Higher Education: A cause for concern?**

The UK is well established at the forefront of the Biological Sciences<sup>4</sup> with the bioscience industry ranked second in the world, behind the United States of America (USA) (Bioscience Federation, 2005). The Biological Sciences are important because they are an integral part of everyday life including food production, health care, the environment, climate change, and the genome project. However, whilst the Biological Sciences make significant contributions to ‘improving national health and increasing national wealth’ (p.4), the rapid increase in student participation within HE has not been reflected within the Biological Sciences or within the physical science disciplines. To illustrate, the number of UK graduates between 1994/5 and 2004/05 remained relatively stable in Physics (between 1900 and 2300) and Biology<sup>5</sup> (between 4000 and 4500) and during the same period Chemistry took a 35% decline (from nearly 4000 in 1994/95 to just over 2500 in 2004/05). Yet, The Royal Society (2006a) has argued that the numbers for Biology, compiled by the Higher Education Statistics Agency (HESA) do not show the true picture saying that they are ‘apparent rather than real’ (p.1). This is because the HESA subject classification methodology changed from 2002/03 onwards, subjects such as Forensic Science, Psychology and Sports Science as ‘other Biological Sciences’ (The Royal Society, 2006b: 32). Thus, the inclusion of these subjects has masked the figures for the ‘core’ Biological

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<sup>4</sup> Biology involves the study of living organisms and prior to study within HE the subject comes under the umbrella of ‘Biology’. Within HE the discipline has a number of sub-divisions for example, Biochemistry, Ecology, and Microbiology. It is these sub-divisions that are collectively termed the Biological Sciences. (Biosciences Federation, 2005)

<sup>5</sup> Figures from the Higher Education Statistics Agency (HESA) originally suggested an increase of 12.8% in the number of Biology graduates. But when the inconsistencies in the data were offset an increase of just 1.7% was calculated.

Sciences where many subjects for example, Botany, Biochemistry and Microbiology are having difficulties recruiting students (The Biosciences Federation, 2005).

As a result of this low level of recruitment and the high costs involved in the provision of practical training, universities have been closing physical sciences departments.<sup>6</sup> Whilst such sweeping closures have not yet taken place within the Biological Sciences, they are faced with a number of concerns (*ibid.*) that might not be exclusive to the Biological Sciences, but they are nevertheless important, as discussed below.

*The Biological Sciences are 'unrestricted'* (Pantin, 1968:18). That is, the subject permeates into disciplinary boundaries drawing upon the ideas, knowledge and techniques of other scientific disciplines. Thus, research and study within the Biological Sciences needs the input from, for example, Physics and Chemistry and also, Mathematics. However, the decline of the Physical Sciences threatens to hinder developments within the Biological Sciences (The Biosciences Federation, 2005).

*Science is perceived as 'hard'* (The Biosciences Federation, 2005). Post-16 students might view science A-levels as harder to achieve. For example, students tend to gain lower average grades within science and also maths subjects (Parliamentary Office of Science and Technology, 2007). In addition, as noted above, the study of the Biological Sciences requires an understanding of other disciplinary areas such as physics, chemistry and maths. Yet, few students study a combination of maths and science at post-16 unless they wish to pursue their study in veterinary science or

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<sup>6</sup> See The Royal Society, 2006b: 26-39 for a fuller discussion

medicine. Therefore upon entry to HE students might struggle to cope with the cross-disciplinary content required for contemporary Biological research (Biosciences Federation, 2005).

*There is a lack of careers advice in schools.* Many students are unaware of the application and relevance of studying the Biological Sciences within Higher Education and the range of careers that a degree in the Biological Sciences could lead to (Parliamentary Office of Science and Technology, 2007; The Royal Society, 2006b).

*The teaching of Biology prior to HE might be a 'turn off'* (Biosciences Federation, 2005). There could be problems with the delivery of the National Curriculum because topics are returned to at different stages of the student's learning and this could be perceived as repetitive and demotivating for students, especially if there is no sense of progression and the teaching activities do not enthuse the learner. This is not helped by health and safety regulations that limit students' access to practical work with animal and plants (*ibid.*). In addition, the importance of Standard Attainment Tests (SATs) GCSE and A-level to schools and colleges has led to an overemphasis upon 'teaching to the test' where students might learn superficially rather than meaningfully engaging with the subject. Such difficulties could contribute to students turning away from studying the subject further (*ibid.*).

*The public view of science and scientists.* Research within the Biological Sciences raises moral and ethical issues which might raise public concern. Such areas of science need to engage the public about developments within areas that might be

sensitive such as stem cell research and cloning for instance. As noted by the Parliamentary Office of Science and Technology (2007), whilst some young people are aware of the positive benefits scientific research can have, others have a different image of science and scientists and have clear concerns about the ethics in science. Again, this could lead individuals to turn away from studying this discipline.

*The mathematical ability of undergraduate students in the Biological Sciences is worrying* (Tariq, 2002,2004). Concerns have been raised about the mathematical abilities of Biological Science students who usually enter HE with a minimum of a grade C at GCSE level (*ibid.*). This has implications in terms of the rapid changes taking place within the discipline in which students' require quantitative analytical skills (Hak and Kendall, 2006).

*There have been concerns raised about the teaching methods of Biological Science modular courses within HE* (The Bioscience Federation, 2005). Most courses tend to be lecture-based and it has been suggested that there is a need to include other teaching methods including, tutorials, seminars, problem-based and inquiry learning, e-learning and as noted below, practical work. In addition there are worries that the modular degree structure might be disconnected and lead to a fragmentation in knowledge and short-term superficial learning because of a lack of integration between different courses. In addition, due to the rapid pace at which knowledge within the Biological Sciences is expanding, and also the ease at which such knowledge can now be accessed, curriculum content requires regular review (*ibid.*).

*There are concerns about the provision of practical work within Biological Science degree programmes.* The cost of practical work provision is a major problem (Jervis, 1999) to the extent that it has contributed to the closure of departments in the physical sciences (The Biosciences Federation, 2005; The Royal Society, 2006b). In addition, the overall decline of practical work within HE degree courses as a result of costs (Biochemical Society, 2002) has resulted in complaints from employers that graduates lack the practical skills they require, thus encouraging them to recruit more staff from abroad (*op.cit.*; Jervis, 1999). A recent review of current trends in laboratory class teaching in university Bioscience programmes (Adams, 2009) reported that in light of a survey of first-year undergraduates (Collis *et al.*, 2007, 2008) and a workshop conducted by the UK Centre for Bioscience (HEA) which included participants from HE and industry, that there is a:

*'[P]ressing need to re-think the traditional approach to bioscience laboratory teaching in UK higher education. In particular, we must move away from 'spoon feeding' students during interminable, repetitive and boring practical classes that have highly predictable results' (Adams, 2009:1).*

Therefore there is a need for students to be provided with laboratory classes that are more challenging and where they are given greater independence in the direction and management of their own learning.

In this section, I have outlined a number of reasons why students might not be motivated to study the 'core' subjects of the Biological Sciences at university. Further, I have suggested that the teaching of the Biological Sciences within HE

might evoke cause for concern. As suggested by Barnett (2007), it would seem that at the present time there is a need to rethink the pedagogies offered to undergraduate Biological Science students. However, we have little knowledge about students' experiences of transition within new and different teaching and learning environments. Indeed research into students' transitions in HE tends to overlook learners' experiences *within* HE, as discussed below.

## **Section 2.4 Students' transitions in Higher Education**

The term transition immediately invokes the idea of a time of change when there is movement, involving a shift, from one place, or position, to another. But it has been indicated that research within this field<sup>7</sup> has had difficulty in understanding the meaning and nature of transition (Ingram *et al.*, 2009), suggesting that it is far more complex than it would at first appear.

*'The research field around transition is fragmented, full of small-scale studies and lacks conceptual clarity. There is a need to take stock of key work and its insights and to build on that'* (Ecclestone *et al.*, 2010:24).

Thus, the way that transitions are conceptualised and examined within the literature might be viewed in different ways. This is taken into account within the discussion overleaf, where I provide a brief overview about how transitions are mostly researched in HE and identify some important themes raised within the literature.

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<sup>7</sup> Literature has been recently produced by a seminar series funded by the Economic and Social Research Council (ESRC) as part of the Teaching and Learning Research Programme (TRLP) entitled 'Transitions through the lifecourse: analysing the effects of identity, agency and structure'. As the title suggests, transitions were examined more widely that is, throughout the life course, as opposed to just those associated with HE.

## Researching Students' Transitions in Higher Education

A key way that transition is depicted within the literature that is relevant to this study, involves individuals navigating pathways, structures and systems (Ecclestone, 2009; Ecclestone *et al.*, 2010). An orthodox view concerns what could be termed as 'situational transitions' (Kralik, 2006:321) which involve the transition from one institutional setting to another such as the shift from Further Education (FE) or school into HE. Such transitions have distinctive start and finish points and suggest a linear trajectory (*ibid.*). Most research about transition in HE involves students' situational transitions that concentrate upon entering HE from school or college (for example, Richter, 1997; Nardi, 2001; Bathmaker and Thomas, 2009; Houston *et al.*, 2009) or upon the shift from HE into employment (for example, Graham and McKenzie, 1995; Harvey and Bowers-Brown, 2004; Tchibozo, 2007). Overall this literature tends to be atheoretical, viewing transitions as being difficult due to a perceived lack of continuity, or a 'gap' between the two different contexts. Further, much research tends to use quantitative survey methods (see: Cook and Leckey, 1999; McInnis, *et al.*, 2000; Lowe and Cook, 2003; Richardson, 2003; Yorke and Longdon, 2008) where there is an emphasis upon identifying good practices and processes to form a generalisable 'tool kit of solutions' (Palmer *et al.*, 2009:39) to ease, or smoothen transitions.

I shall begin with research about the transition from school or FE to university that also comes under the umbrella of 'first-year experience' (Houston *et al.*, 2009:149). This represents the largest body of research examining transitions in HE, with little research conducted *within* HE (Ingram *et al.*, 2009; Ecclestone, 2009; Ecclestone *et al.*, 2010).

The body of research about students moving into HE is mostly concerned with student attrition and as a consequence of this, university reputations and finances (Wilcox *et al.*, 2005). The first-year has received greatest attention because it has been identified as the most crucial for discontinuation of study and dropout from university courses (Yorke and Longden, 2008). There have been several government-funded projects aimed to assist first-year students to adjust to academic life (*op.cit.*) driven by targets to reduce the rates of non-completion (DfES, 2002). The focus of work in this area identifies the difficulties that students might face, and highlights that individuals will undertake various academic transitions in addition to undergoing social transitions in terms of making new friendships and establishing peer groups. Students may also have transitions in location, moving to a new city or town and into new accommodation such as residential halls or rented accommodation (Housten *et al.*, 2009). Therefore, the literature concerning the transition into HE points to a time of rapid change when students will undertake various transitions concurrently.

Moving to the situational transition from HE to employment, this research tends to focus upon the preparedness of students and concentrates on how HE can help students to be ready for the transition to the workplace (Bennett *et al.*, 2000; Fallows and Steven, 2000; Knight and Yorke, 2003; Auburn, 2007). A lot of this research has been undertaken because of concerns that existing undergraduate programmes do not produce graduates with the appropriate life-long learning skills relevant for careers (*ibid.*; Dench, 1997; Morley, 2001; Mallia, 2009) . In an attempt to reduce such disparities between HE and work and thus ease graduates' transitions, employment initiatives have been developed within HE which include for example, an emphasis upon the development of skills within the curriculum that are applicable to



employment, including opportunities for work experience and the recording of achievements through the use of personal development portfolios (PDPs) (Courts and McNerney, 1993; Young, 2002; Harvey and Bowers-Brown, 2004; JISC, 2008).

In sum, most research about student transition in HE concerns situational transitions into and out of HE and tends to focus upon the movement through institutionalised pathways, identifying the different factors that cause students difficulties and problems. A key theme indicated within the research shows that students could experience ‘gaps’ between different contexts that they find difficult to breach. Much research seems to aim to make the transitions between different institutions and contexts smoother and hence, ease the change that students might experience. The emphasis therefore, is upon shielding against difficulty where there is a somewhat hegemonic assumption that students are unable to cope with transition without the implementation of formal management (Ecclestone, 2009). Yet, I will show within this thesis that this view does not necessarily lie easily with the potential for creativity, challenge, surprise, becoming and changing, that transition might bring. Moreover, much research uses survey methods, that recommend generalisable solutions and frames transition as ‘one size fits all’ (Palmer *et al.*, 2009:38). Therefore, this research does little to acknowledge the experiences of individual students. This is an important shortfall that this study aims to address. Below I discuss the examination of the ontological aspects of transition that is the focus of this study.

## **The ontological dimension of transition**

More subtle approaches to thinking about transition propose that it involves a shift in identity (Savin Baden, 2000, 2008a, 2008b; Meyer and Land, 2003, 2005, 2006; Barnett, 2007; Ecclestone, 2009, Ecclestone *et al.*, 2010; Satchwell and Ivanic, 2009) such as a move from school or college student to becoming a university student (Houston *et al.*, 2009). However there is little research about transition within HE, particularly within the work that focuses upon situational transitions that examines identity, or about how transitions might be experienced personally by individuals. For example, although some research concerning the situational transition into HE is termed as ‘first-year experience’, there is little work that connects transition to different students’ biographical accounts about their actual experiences; they remain dislocated from each other (*ibid.*) (For exceptions see: Christie *et al.*, 2008; Palmer *et al.*, 2009; Karousou, 2010). By overlooking the notion of identity therefore, much research fails to illuminate other issues that might correspond to the notion of transition (Lynch and Field, 2007). To illustrate, the examination of identity shifts highlights the point that transition involves an ontological process of ‘being and becoming’ (Ecclestone, 2009: 12) somebody, in terms of this study for example, a Biological Sciences undergraduate student. I highlight below that the writing by Barnett (2007) and research on threshold concepts and academic literacies start to cast light upon the ontological aspects of transition within HE. Although the notion of transition is not the main focus of this work, it is nevertheless useful to my thinking.

Barnett (2007) has proposed that ‘[a] genuine higher education is not just a matter of intellectual travel or even a movement through new kinds of practice, but it is also a

matter of 'self-travel' (p.76). He argues that using ideas that focus upon the ontological dimension of being and becoming a student in HE opens up new themes by which to explore ideas around self and also, what aids students to keep engaged with their studies, despite experiencing difficulty and uncertainty. By inquiring about these issues it allows other important concerns to come into view, such as learner dispositions which could include, 'a will to learn'; 'a will to engage'; and 'a determination to keep going forward' as well as learner qualities, such as 'courage'; 'resilience'; and 'respect for others' (*ibid.*:102). So it would seem that an emphasis upon examining students' being and becoming helps to unmask what might enable or disable learners to personally engage and how the development of inner qualities and capacities might help to sustain learners when faced with change.

Students' engagement when faced with difficult conceptual knowledge is examined in threshold concept theory.

### **Threshold concept theory**

The notion of threshold concepts has become an important part of research in Higher Education which emerged as a result of a large scale United Kingdom (UK) research project that formed part of the Economic and Social Research Councils' (ESRC) Teaching and Learning Research Programme (TLRP). Through their research within the discipline of Economics and also discussions with practitioners across a range of disciplines and institutions, Jan Meyer and Ray Land (2003) in their seminal paper, propose that in each discipline there are certain concepts that are essential to the mastery of a subject. In so doing, Meyer and Land (*ibid.*) argue that these should be described as 'threshold concepts', as they could 'be considered as akin to a portal,

opening up a new and previously inaccessible way of thinking about something' (p.1). Thus university teachers can view a threshold concept as a 'core' or 'key' concept (Meyer and Land, 2006: 6) that acts to progress students' understanding in a subject.

Meyer and Land (2003, 2005, 2006) therefore, maintain that study within HE requires the navigation of conceptual understandings that could involve 'difficult conceptual and affective transitions' (Beatty, 2006:xi). Failure to understand threshold concepts has been theorised as confining learners to a state of 'liminality' (Meyer and Land, 2003:13) where they might be stuck, experiencing 'ontological' or 'epistemological obstacles' (Meyer and Land, 2006: 30) that prevent them from moving forward and crossing the threshold that represents understanding. However, at the present time this research emphasises the epistemological aspects of threshold concepts (Savin-Baden, 2008a, 2008b; Karousou, 2010), leaving the ontological dimensions rather overlooked (for exceptions see: Clouder, 2005; Cousin, 2006; Booth, 2006; Sibbett and Thompson, 2008). That said, threshold concept theory does offer a way to extend our understanding about how individuals might personally experience transition within HE and I will discuss this further within Chapter 3.

### **Academic literacies research**

The academic literacies movement in the United Kingdom (UK) was stimulated by Mary Lea and Brian Street (1998) and represents a move away from writing as being seen as a study skill which can be easily transferred between different contexts, towards a view that writing is a 'complex, socially situated set of meaning making practices' (Gourlay, 2009:182). The underlying assumption is that when students

enter and study within a discipline they need to develop an understanding of the vocabularies, voices and conventions of the subject area. Academic literacies research has been conducted in a wide variety of university settings involving different groups of students and the research has consistently revealed that students' struggles with academic writing might be due to differences in tutor and student expectations and understandings of the requirements for written assessment (Lea, 2005). Confusion has also been found to occur when students are presented with different terms associated with academic writing requirements, such as 'essay' and 'report' (Williams, 2005). Research has shown that students may experience difficulties when they move between different writing tasks, referred to as 'course switching' (Lea and Street, 1998:161) and also, when negotiating complex and contested discourses (Lea and Steirer, 2000).

A noteworthy aspect of academic literacies research in terms of this study is that it incorporates an examination of students' identities within its analytical frame, representing a shift towards exploring the students' perspective. By taking this view, it emphasises that academic writing involves the process of developing a 'voice'. Thus, by focusing upon the ontological dimension of learning, other themes can be revealed. For example, academic literacies research explores the ways in which students might feel marginalised from engaging with writing tasks (Lea, 2005), as pointed out by Lea and Street (1998): 'A student's personal identity - who am 'I' - may be challenged by forms of writing required in different disciplines [...] the students may feel threatened and resistant - 'this isn't me''(p.159). Academic literacies research, therefore, highlights that students may experience various

difficulties when engaging with academic writing and complements the ontological dimension of students' transitions in HE involving being and becoming a student.

To sum up, I have highlighted that the ontological dimension of transition involving self, shifts in identity and the process of being and becoming tends to be overlooked within research in HE. I have identified some exceptions that might aid illumination including threshold concept theory which examines students' experiences when faced with difficult conceptual knowledge and academic literacies that is associated with student academic writing. However, this work is limited to students' understanding of epistemological knowledge and academic writing and I argue that a deeper and wider understanding is required about the ontological dimension of transitions. Therefore I concur with the view of Ecclestone (2009:12) who has identified that a better understanding is required about how 'individuals might progress, socially, personally and emotionally' as well as academically, within and between various levels of learning in HE. Extending this argument we need to further our knowledge about how students might react and cope (Palmer *et al.*, 2009; Karousou, 2010) when faced with the familiar, unfamiliar and the unthought of. Matters such as this are important because they help us to illuminate the rather overlooked factors that might influence and shape individuals' transitions within HE.

## **2.5 Conclusion**

In this chapter I have presented different contexts surrounding the case study that are important to consider in terms of students' transitions within HE. I have noted that we are living in a time of rapid change and highlighted the changes taking place within HE. I have also drawn attention to the discipline of the Biological Sciences

and suggested that pedagogies in HE need to be rethought, including the provision of laboratory teaching.

I have provided a brief overview about how transition is mostly researched in HE. The review highlights that there is a need to examine transitions within and between different levels in HE. I have also identified that much research fails to examine and report the different experiences of individual students and consequently, issues associated with the notion of transition in terms of self, identity shifts and being and becoming, remain rather overlooked. It is against this backdrop that I set my study.

Throughout this thesis, I argue that Donald Winnicott's notion of transitional space and play helps us to address such short falls and in Chapter 3 I introduce his work and outline the theoretical framework for the study.

## **Chapter 3**

### **Students' experiences of transition in Higher Education: The theoretical framework**

#### **3.1 Introduction**

In this chapter I aim to present an overarching theoretical framework suitable to illuminate the students' experiences of transition examined in this study. I recognise that transition has been theorised to take place within different 'spaces' and I begin by introducing the work of the British psychoanalyst Donald Winnicott (1896-1971) and his theory of 'transitional space and creative play'. Within this thesis I seek to demonstrate that Winnicott provides a more encompassing framework for examining students' experiences of transition than the alternatives. I follow by connecting Winnicott's ideas about transitional space and play to literature that deals directly with Higher Education (HE) pedagogy by discussing how students' transitions are usually theorised as being experienced in 'liminal' space (Van Gennep, 1960; Turner, 1969). This notion is becoming increasingly used to examine students' transitions in HE, particularly in terms of 'threshold concept' theory (Meyer and Land, 2003, 2005, 2006; Land *et al.*, 2008). Then I examine Maggi Savin-Baden's (2008a, 2008b) model of transitional learning spaces that begins to extend the concept of liminal space. I compare these alternative theoretical spaces and show how I will use them within this thesis, before finally introducing the concepts of 'play space' (Creme and Hunt, 2002:156) and 'academic play' (Creme, 2008: 49), that draw upon Winnicott to examine the writing of university students.



In light of the examination of the literature, the chapter concludes with a presentation of the overarching research questions that the thesis aims to investigate.

### **3.2 Theorising how transition is experienced: Donald Winnicott's transitional space and play**

I start by providing the reader with a brief introduction to the British psychoanalyst, Donald Winnicott, before detailing his theory of transitional space and play.

#### **Donald Winnicott: Paediatrician and psychoanalyst**

As a schoolboy Winnicott developed an interest in Charles Darwin's theory of evolution. He later described his fascination in a talk in 1945 to St Paul's School when he spoke about reading 'The Origin of Species':

*'I could not leave off reading it. At the time I did not know why it was so important to me, but I see now that the main thing was that it showed that living things could be examined scientifically with the corollary that gaps in knowledge and understanding need not scare me. For me this idea meant a great lessening of tension and consequently a release of energy for work and play'* (In Phillips, 1988b: 1).

It was Winnicott's (*ibid.*) idea therefore, that 'gaps' caused by the unknown should not be frightening, but provide the potential for imagination and new knowledge. This idea was to remain influential and feature within his theories and writing (*ibid.*; Molino and Ware, 2001). Winnicott continued to hold the interest he had initially shown in Darwin as a schoolboy and read Biology at Jesus College Cambridge, going on to study medicine (*op.cit.*). He began his career as medical practitioner,

specialising as a paediatrician, subsequently becoming interested in psychoanalysis (Phillips, 1988b). His second wife, Claire, (Winnicott, 1978) wrote that during her husband's day-to-day work, the 'psychological aspects of illness' (p.28) became increasingly important to Winnicott. In 1923 he acquired two positions as a Consultant in Children's Medicine, one at 'The Queen's Hospital for Children' and the other, at 'Paddington Green Children's Hospital', (*ibid.*: 28) that was later to become a psychiatric clinic where he worked for forty years. At the same time he set up practice as a private consultant in Harley Street (*ibid.*). This was the beginning of Winnicott becoming both paediatrician and psychoanalyst. It was here in a clinical setting that Winnicott began to develop his ideas about transitional space and play.

Winnicott's interest in psychoanalysis was initially influenced by the work of Sigmund Freud (Phillips, 1988b; Creme, 1994; Shepherd *et al.*, 1996). Later he became interested in the work of Melanie Klein (Phillips, 1988b; Creme, 1994; Molino and Ware, 2001) in Berlin, who used the psychoanalytical method to treat children, her key influence being her 'play technique' (Phillips, 1988b: 43) to analyse children. When Klein came to England in the 1930's she sometimes supervised Winnicott's work (*ibid.*; Davis, and Wallbridge, 1991). Drawing upon such influences Winnicott later extended his ideas, using his experiences as both paediatrician and psychoanalyst, to make major contributions to 'the theory of emotional development' (*ibid.*:25).

In 1953 Winnicott became a member of the British Psychoanalytical Society, where he was elected twice as president. He was also a fellow at the Royal College of College of Physicians (Shepherd *et al.*, 1996). Over his forty years of work

Winnicott saw over '60,000 infants, children, mothers, fathers, parents and grandparents' (Khan, 1984: xi). When he died in 1971 he left over one hundred papers and lectures that were unpublished (Davis, 1991) many of which were later edited and published (see *ibid.*: 175 for details). After the death of his wife Claire, a charitable fund was set up called 'The Winnicott Trust' that helps to finance training and research into, for example, child psychiatry and psychoanalysis and aims to promote and disseminate the work of Donald Winnicott (*ibid.*).

Winnicott's theory about transitional space and play and associated ideas are now discussed.

### **Donald Winnicott's theory of transitional space and play**

The concept of transitional space forms part of Winnicott's overarching theory of emotional development that focuses upon the 'evolution of personality and character' (Winnicott, 1958b: 3). Central to his work is the belief that although life may inevitably present difficulties and problems, it should be always worth living (Phillips, 1988a). He advanced the view that individuals should be enabled to 'come together and exist as a unit, not as a defence against anxiety, but as an expression of 'I AM, I am alive, I am myself' (Winnicott, 1971:76) (original emphasis). Therefore he viewed a key part of growing up which he proposed to continue throughout life, to be the development of a sense of aliveness. He observed that in order to develop this sense of aliveness, it must be made possible for all individuals to play creatively, 'it is creative apperception more than anything else that makes the individual feel that life is worth living' (*ibid.*:87). This contrasts not to deadness, rather to complying and fitting in with the outside world which he associated with a sick basis for life,

rendering it futile and not worth living (*ibid.*). '[I]t is in playing and only in playing that the individual child or adult is able to be creative and to use the whole personality, and it is only in being creative that the individual discovers the self' (*ibid.*: 73).

Winnicott (1971) then, saw 'creative, physical, and mental activity' (p.75) as play which forms the basis for creative living and cultural experiences in adult life. It is through play, that it is made possible for individuals to search and discover the self (*ibid.*). However in order to achieve such experiences he proposed that the 'third area of human living' (*ibid.*: 148) must be opened up. The two other areas consist of the 'inner or personal psychic reality' and the outer of transitional space, the 'actual world' (*ibid.*:138) in which the individual lives. It is here, in this third space where creative play and creative experiences are located. The third area is what Winnicott (*ibid.*) also referred to as an 'intermediate zone' (p.141) because it is positioned between the inner self and outer world and is also a 'potential space' (p.55). He called it a potential space because it is the individual who must create it and make it exist and as such, there is nothing that makes the space inevitably transitional. Intermediate and potential space represent what is also called transitional space, an expression I will use throughout this thesis, and now expand on in more detail, below.

### **The concept of transitional space**

Winnicott developed his ideas about transitional space through his work as a paediatrician and child psychologist (Phillips, 1988b). The concept of transitional space is based upon his observations of mothers and their infants and children who

had been evacuated into hostels outside London during World War II. It was here that he gained an increasing interest in the mother-infant relationship and the emotional development of children. In particular, he explored how children and infants adjust to becoming separated from their mothers<sup>8</sup> and how they gradually develop the 'capacity to be alone' (Winnicott, 1958a: 29). Winnicott (*ibid.*) proposed that the particular transition of separation, especially from the mother is crucial for the development of an individual to become capable of autonomy that is, 'one of the most important signs of maturity in emotional development' (p.29). Put simply, this significant transition involves the infant/child embarking on a 'journey from absolute dependence, through relative dependence, to independence' (Winnicott, 1960a: 42). During this journey the person's experiences are located within transitional space which as indicated previously, is positioned between the inner 'me' and the outer 'not me' (Winnicott, 1971:135):

*'[W]hereas inner psychic reality has a kind of location in the mind or in the belly, or in the head or somewhere within the bounds of the individual's personality, and whereas what is called external reality is located outside those bounds, playing and cultural experience can be given a location if one uses the concept of the potential space between the mother and the baby' (ibid. :71-72).*

He added that a 'third' or 'intermediate' space:

*'[V]aries greatly from individual to individual and its foundation is the baby's trust in the mother experienced over a long-enough period in the critical stage of the*

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<sup>8</sup> The word 'mother' is used throughout to refer to both mother and mother figure and could be any caregiver, including a father and mother figure.

*separation of the not-me from the me. When the establishment of an autonomous self is at the initial stage' (ibid.:148).*

Winnicott (1963a) then, proposed that transitional space is founded early on in life when the infant begins a transitional journey from absolute dependence towards independence which involves a continuous process of 'separation-individualisation' (Bergman, 1978:149). This maturational process continues during adolescence and throughout adulthood in which it becomes ever more complicated (*op.cit.*). At the beginning, Winnicott (1960c) proposed that the newborn infant does not feel separate from the environment and will have no knowledge of space. Consequently for a baby there is no distinction made between the inner 'me' and the outer 'not me'. The mother is essentially merged with the infant through her actions, warmth, milk and so forth and the baby is totally dependent, both physically and emotionally. Hence, the self of the infant has not yet emerged and therefore at this stage, the baby possesses a 'potential' self (*ibid.*:18).

At around the end of the first year of life (although this time-scale could vary between individuals) a space which both separates and unites the infant and mother is created and continues to grow. In this space comes a transition to the state of relative dependence which involves the infant beginning to adjust to a shared reality where the 'me' starts to become separate from the 'not me'. This important transition involves an intense experience within the transitional space which 'is at the interplay between there being nothing but me and there being objects and phenomena outside omnipotent control' (1971:135). The space is transitional because within it there is a movement of inner self in relation to the outer environment in which the 'me'

encounters the 'not me' and as a result of the actions, taken in response to such encounters, the inner self develops and perceptions of the outside environment are changed.

During this transition Winnicott (1958b) argued that the infant would move away from being in an unintegrated state, characteristic of absolute dependence, towards becoming more independent with an integrated personality, in which the self becomes a single unit with a definite personality. This indicates that during transition, the infant will start to begin to gain a sense of shared reality, but also of self and identity (Davis and Wallbridge, 1991). However at the start, this change in state is not stable and consequently oscillation may occur between prior and new states in which the infant may leave a prior state of unintegration, but subsequently return back, before leaving again. This might also be accompanied by a sense of loss for example; an infant who returns to a state of dependence will consequently lose a degree of integration and independence. Nevertheless, in time integration becomes more settled and the 'infant becomes more knit together as a unit' (*op.cit.*: 6) with a strengthened sense of self or 'ego' (p.8). This suggests that Winnicott did not view the transitional journey towards independence as smooth and linear, rather as one that might include recursive movements that involve a sense of loss.

During the transitional journey towards integration and independence, Winnicott (1955) also pointed out that on occasion, an infant can become vulnerable and may experience anxiety. ' I suggest that this I AM moment is a raw moment; the new individual feels infinitely exposed. Only if someone has their arms around the infant at this time can the I AM moment be endured or rather, perhaps risked.' (p.148)

(original emphasis) Therefore, Winnicott proposed that holding might help to facilitate experiences in transitional space.

### **A facilitative holding environment**

Experiences within transitional space may be made more favourable through the provision of a 'holding' (Winnicott, 1971:150) or 'facilitating' (Winnicott, 1963c:239) environment which acts to strengthen the infant's inner self. This environment is made available by the mother who through love and devotion, actively adapts to the needs of her baby through what Winnicott termed 'good enough' (*op.cit.*:13) mothering. The concept of 'good enough' involves the mother naturally providing adequate care to the evolving needs of children and infants and not being over-protective, or perfect. As Winnicott (1971) said, 'perfection belongs to machines, and imperfections that are characteristic of human adaptation to need are an essential quality in the environment that facilitates' (p.187). Therefore as time passes, the mother who at first adapted completely to the needs of her baby begins to adapt 'less and less completely, gradually, according to the infant's growing ability to deal with her failure' (*ibid.*:14). Hence transition is eased through sensitive adaptation to the needs of the infant and as such, makes it a much more gradual process. Furthermore, adaptation by the mother might involve filling the transitional space with transitional phenomena or transitional objects (Winnicott, 1951).

Transitional objects and phenomena ease and facilitate transitions, for example a doll or a teddy taken to bed by an infant may help the transition from being awake to sleeping and dreaming. However, the transitional object is most precious to the infant because it represents the first 'not me' possession that symbolises someone close.



Transitional objects might act to initiate the infant's creative impulse because they function as a bridge to and from external reality and thus, correspond with Winnicott's intermediate, transitional space. Through the opening up of this space the infant will be facilitated to tolerate anxiety and frustration and hence, sustain transition by putting him / herself imaginatively in relation with the outside environment. Furthermore, Winnicott (1971) thought that transitional objects also serve as a bridge between the familiar and the disturbing unfamiliar, '[t]he transitional object, according to my suggestion gives room for process of being able to accept difference and similarity' (p.8) and hence, it is also through the acceptance of the new and different that an individual is 'enabled to grow and develop a sense of reality and identity' (Rose, 1978:351).

Therefore, good enough environmental provision plays a key role in facilitating the difficult transitions that an individual may face (Winnicott, 1971). Winnicott (*ibid.*) noted that through the appropriate adaptation by the mother, the infant gains trust and a sense of reliability and thus, over a period of time the infant is able to develop confidence in the exterior environment. The stability that this provides 'can be gained in no other way' (Winnicott, 1960d: 28) and this reliability is essential for the 'continuity of being' (p.28) vital for healthy emotional development which is 'personal and real' (Winnicott, 1958b: 17). As a result of good enough mothering, positive experiences and the sense of aliveness within the transitional space, Winnicott thought that the 'true self' (Winnicott, 1960b: 140) would emerge.

## **True and false self**

The true self involves a sense of integrity and connectivity in which the person is spontaneous and alive and as such has the capability to 'stand frustrations and deprivations and the presentation of new situations' (Winnicott, 1950d:144). Therefore by facilitating the individual's capacity to play and feel a sense of aliveness he or she will be enabled to cope when faced with traumatic experiences which is important because these experiences might threaten to sever our capacities to connect, as well as to be separate and move towards independence (Ellsworth, 2005). As Winnicott (1960d) proposed:

*'[W]e want to make it possible for each individual to find and establish his or her own identity [true self] in such a solid way that eventually, in the course of time and in the individual's own manner there will be attained a capacity to become an active, creative member of society, without loss of personal spontaneity and without loss of that sense of freedom which comes from health from within' (p.28).*

However, he was clear that not all individuals are enabled to achieve this, 'We tend to regard it as normal for the child to experience the full extent of shock as the mother becomes an adaptive external person, but we have to admit that there are casualties' (Winnicott, 1966:131).

Winnicott (1960b) pointed out that individuals might experience transition in different ways and all individuals have varying degrees of both true and false self which can be placed on a continuum between the two extremes of healthy and pathological. In health, a true self will be apparent in which the false self acts to

protect the true self through polite social compliance. Towards the other end of the continuum, if an infant or child is repeatedly deprived of good enough mothering 'then the child has only one way out which is a split in the personality, with one half related to a subjective world and the other reacting on a compliance to the world it impinges.' (*ibid.*: 144). This means that if the mother does not adapt sensitively to the individual needs of an infant, the continuity of being may be stopped and the true self annihilated (*ibid.*: 147), so that the true self could fail to develop and instead the false self which fits into social situations through forced compliance rather than adaptive love, predominates. In the extreme pathological state the true self is completely hidden by the false self. Thus the false self never gains independence from the mother - it remains unintegrated and does not have the capacity to use transitional objects or phenomena and as a result is deprived from opening up the transitional space where play and cultural experience is located. Consequently, the transitional space becomes a gap that cannot be bridged and the false self gives rise to 'feeling unreal or a sense of futility' (*ibid.*:148).

So far, the ideas presented about transitional space have tended to focus upon infants and children. However, I have indicated within this discussion that Winnicott (1951) emphasised that transitional processes do continue throughout life, 'it is assumed here that the task of reality acceptance is never completed that no human being is free from the strain of relating inner and outer reality' (p.240). Therefore, transitional space is a 'part of everyday living' (Creme, 2008:51) and learning. I have also highlighted that transitional space is a psychological and physical space and it is also a social space where movement might take place in relation to the ideas, thoughts,

voices and so forth, of others. I now consider Winnicott's ideas about communication.

### **Winnicott's notion of communication**

In nearly all the papers he wrote Winnicott's referred explicitly to language, although he was inclined to concentrate upon individual words, rather than language as an overarching process (Phillips, 1988b). This is because his work tended to focus upon infancy which represents a stage that 'implies not talking' (Winnicott 1960a: 40). However, he wrote that while the mother-infant relationship is essentially non-verbal, there are subtle means of communication taking place in which the infant signals his or her wants and needs to the receptive mother (*ibid.*). Language therefore, was what Winnicott saw as being 'added' at later stage, widening the infant's capacity to communicate (Phillips, 1988b: 139). Winnicott (1963b) went on to write that in health, the child:

*'[P]ossesses three lines of communication: communication that is for ever silent, communication that is explicit, indirect and pleasurable, and this third or intermediate form of communication that slides out of playing into cultural experience of every kind' (ibid.: 188) (original emphasis).*

The first kind of communication that Winnicott suggests is non-verbal and links to feeling real, 'it belongs to being alive' (*ibid.*:192). Phillips (*op.cit.*) suggests that dreaming provides the most convincing example of non-verbal communication for it involves the imagination and personal thoughts. In health, it is out of for ever silent communication that other forms of communication naturally arises, including the

second form which is associated with verbal language that protects the separateness and isolation of self. In Winnicott's (1963b) account verbal language is likened to transitional phenomena and transitional objects within the good enough environment that 'enable the child to stand frustration and deprivations and the presentation of new situations' (Winnicott, 1950d: 144). Therefore, this second form of communication might act as a bridge between the inner familiar and the outer, disturbingly unfamiliar (Winnicott, 1958b). Lastly, the third intermediate form of communication is 'the most valuable compromise' (Winnicott, 1963b: 192) that is, a compromise between the two extremes; explicit verbal communication, and silent personal communication that feels real. This intermediate form of communication is located within transitional space, the shared area that has elements of both inner self and outer world where, as noted above, communication 'slides out of playing into cultural experience' (*ibid.*:188).

As I have noted, the development of the capacity to play was central to Winnicott's (1971) work, 'playing facilitates growth and therefore health; playing leads to group relationships; playing can be a form of communication in psychotherapy' (p.56). Taking the idea of play and communication further, Winnicott (*ibid.*) describes the conversation that is psychoanalysis as being a form of play, it 'has to do with two people playing together' (p.51). Psychoanalysis in Winnicott's view therefore, is mutual play taking place within an overlap between two spaces; that of the patient and that of the therapist. Thus, he suggested that adults playing could be discerned in for instance, in the 'choice of words, in the inflections of the voice, and indeed in the sense of humour' (*ibid.*:54). As well as seeing communication as a form of play, Winnicott (*ibid.*) thought that the analyst's interpretation signified maternal care, by

providing the opportunity for communication and its recognition where the patient can creatively discover for him or herself. Therefore, good enough holding is evident when the analyst makes allowances for the patient's capacity to play (*ibid.*). However playing stops within overlapping transitional space when one of the participants becomes too dogmatic. The patient's resistance therefore, according to Winnicott (1963b) is a reflection of the analyst's failure to play, '[I]f we fail to behave in a way that is facilitating the patient's analytic process (which is the equivalent of the infant's and child's maturational process) we suddenly become not me for the patient and then we know too much' (p.189).

Thus, Winnicott emphasised the importance of mutual verbal play with a 'playmate' (Ellsworth, 2005:76) who does not dominate or impinge, thus keeping transitional space open. The alternative is the patient complying with the interpretation, or rejecting the analytical set up. So overall, the analytical setting according to Winnicott should mirror the mother providing a good enough environment for her infant, in which mutual communicative play within overlapping transitional space facilitates the capacity to play and thus, personal growth (Phillips, 1988b).

So far I have proposed that Winnicott's work draws attention to some very interesting ideas about: transitional processes; how transitions may be experienced personally; and what might facilitate or hinder transitions in terms of both outer and inner worlds, yet for my purposes it is noteworthy that he actually made little direct reference to learning (Phillips, 1988b; Creme, 2008), discussed overleaf.

## Winnicott and Education

Winnicott rarely referred directly to learning (Phillips, 1988b; Creme, 2008). However, in a particular lecture to social workers, Winnicott (1950a) drew on his general ideas about child development to emphasise that all people always need to make connections between the inner and outer worlds. In so doing, he uses university students studying Psychology as an example. He proposed that there are two stages that students will regularly pass through when learning the subject of Psychology. In the first stage, the learner simply learns what he or she is taught and therefore the learning of Psychology will seem to be no different from learning other things. This stage of learning therefore, bears similarity to Perkins's (1997) idea of ritualised knowledge which he describes as having a 'routine and rather meaningless character' (p.7) and could involve for example, learning dates and names. Hence, this first stage of learning Psychology does not seem to involve making meaningful connections because 'you make no contribution from your own person' (*op.cit.*: 14). Therefore this stage of learning expresses the idea that the learner is compliant but in contrast, in the second stage:

*'They begin to wonder - yes but is it true, is it real, how do we know? In this second stage, the psychological teaching begins to separate out from the other as something that can't just be learnt. It has to be felt as real, or else it is irritating or even maddening' (op.cit.:13).*

Thus in the second stage the student's learning becomes personally meaningful and what is learnt is felt as real. By bringing the inner self in relation to the outer environment connections are made within the transitional space through playing

creatively with ideas and ‘attack[ing] the subject with questions and see[ing] what survives’. As a result they are able to identify with the subject and find the ‘bits’ that they can use and draw on them accordingly for their ‘self fashioning’ (Phillips1988a: 86).

In this thesis I continue to argue that Winnicott’s ideas about his theoretical transitional space and play are applicable to students’ experiences of transition when learning within HE. In so doing, I take up Ellsworth’s (2005) proposition that Winnicott can be seen:

*‘[A]s a teacher who realised and described in graphic terms the hazards of addressing students as fixed and static subjects of pedagogy rather than as moving subjects on a continuous passage towards knowings that are always incomplete... [therefore] transitional space invites us to imagine pedagogy as addressing the learning self as an emergence – as a self and an intelligence that is always in the making’ (p.57).*

By using Winnicott’s ideas I examine how second-year Biological Science students’ might react, cope and personally develop when faced with transition and in addition, how their transitions might be facilitated or hindered.

Overleaf, I connect the overarching theory of Winnicott’s transitional space and play to students’ transitions in HE by exploring alternative spaces within which transition has been theorised to take place.



### **3.3. Using Winnicott's notion of transitional space to examine students' experiences of transition within Higher Education**

In this section I justify the use of Winnicott's transitional space and play as an appropriate overarching theoretical frame for this study. To show the connections with Winnicott's ideas within the field of HE pedagogy I discuss literature that theorises the student experience within HE as transitions within alternative spaces. This literature is two-fold: first that relating to the notion of 'liminal space' (Van Gennep, 1960; Turner, 1969); and second that developed by Maggi Savin-Baden as 'learning spaces' (2008a, 2008b). I argue that although the ideas presented within the literature are useful when thinking about the student in transition, for my purposes Winnicott provides a more encompassing and illuminating frame than either 'liminal' or 'learning' spaces alone. Finally, I introduce the contemporary notion of 'play spaces' (Creme and Hunt, 2002:156) and the idea of 'academic play' (Creme, 2008: 49).

#### **Transitions within liminal space**

In Chapter 2 I identified that there is little research that examines students' personal experiences of transition within HE and that most research tends to be atheoretical. One notable exception I highlighted is the recent and increasingly influential research into 'threshold concepts' conceived by Meyer and Land (2003, 2005, 2006; Land *et al.*, 2008) which examines the different problems that students might experience when studying difficult, or 'troublesome' (Perkins, 2006: 36-41) conceptual knowledge. A main component of threshold concept theory is the use of the notion 'liminal' (Van Gennep, 1960; Turner, 1969) (from the Latin *limen*, boundary or threshold) space to conceptualise how learning transitions might be

experienced by students as they cross a range of 'thresholds' that represents the achievement of understanding. Below, I describe how liminal space has been conceptualised and suggest that whilst it is useful in understanding the processes involved in transition it is limited for the purposes of my research.

The social anthropologist Arnold Van Gennep (1960) originally conceived the notion of 'liminality'. Liminality represented a time and space where transition took place as part of a threefold scheme about rites of passage involving: (1) *Pre-liminal rites*. The rites of separation - the separation from an old status in the old world (2) *Liminal or threshold rites*. The rites of transition - having been separated from one status, but not yet incorporated into a new status. (3) *Post-liminal rites*. The rites of incorporation - a new status in a new world. The idea of rites of passage therefore, seeks to explore rituals and ceremonies that mark a significant transition to a new social status, for example, childhood to adulthood. Turner (1969) built upon the work of Van Gennep and went on to focus upon the second, intermediate rite of passage, liminal space. This is a space which is 'betwixt and between' (Turner, 1995:95) where there has been the separation of an old identity, but a new identity has not yet been incorporated; a space where experiences of transition are located and where identity transformation takes place. The liminal stage might last a period of time where there can be an oscillation between the different states before the new identity fully emerges. Yet, whilst these ideas are useful to our thinking about transition and correspond in a number of ways to Winnicott's (1971) ideas about separation and unintegration, transition and integration, there has been little consideration about how liminality relates to students' actual experiences within HE (Savin-Baden , 2008a, 2008b; Entwistle, 2008) This issue is now explored.

## **Liminality, socially sanctioned rites of passage and rituals within Higher Education**

Van Gennep's (1960) work on rites of passage as described above, are based upon a structuralist view of the ritual process (Lam and Pollard, 2006). Van Gennep (*op.cit.*) observed that an individual's actions and reactions during rituals and ceremonies are closely regulated and guarded, 'so that society as a whole will suffer no discomfort or injury' (p.3). Therefore, rites of passage reinforce structure through social positions being unchallenged, so gaps in these positions are necessary for structure. Drawing upon these ideas, Turner (1995) saw liminal space as representing an 'anti-structure' where individuals are physically removed from structure during the ritual process. Here they gain a sense of *communitas* including feelings of solidarity when the individuals are required to comply with the authority of the ritual elders. This involves individuals having nothing to distinguish them from their fellow people; they have no identity (Meyer and Land, 2005). The transition might be experienced as problematic and troubling when for example, individuals might be stripped of their clothing and their 'behaviour is normally passive or humble; they must obey their instructors implicitly and accept arbitrary punishment without complaint' (*op.cit.*:95). Therefore, individuals' experience of liminality seems to be representative of inferiority and powerlessness (Sibbett and Thompson, 2008) yet it is such humility which reinforces the pride in reaching a new position (Turner, 1995). So the rituals associated with anti-structure actually act to reinforce structure because they are 'socially sanctioned and seek to maintain the status quo' (Savin-Baden, 2008b:84). Whilst liminality might be viewed as necessary for structure, along with rites of passage and rituals, it could also be seen as a form of 'social control' (p.85).

Transferring these ideas to students' experiences of transition within HE the notion of liminal space appears to imply a dominant disciplinary power where students might be viewed as passively complying with academic rites of passage and rituals in which turning away from entering liminal space threatens academic structure. In terms of threshold concept theory Meyer and Land (2006) use the ideas about liminality to view rites of passage as akin to students' entry into a discipline which might be 'transformative' (p.22) where they might start to think like for example, a scientist, a mathematician and so forth. As a result of the ritual an individual will attain a new identity within the discipline, such as gaining graduate status. Finally, Meyer and Land (*ibid.*) view this progression as possibly being protracted when the student is in a liminal space where there could be oscillation between states and sometimes regression. The learner might also be stuck and exhibit 'compensatory mimicry' (*ibid.*:24) making unauthentic attempts to learn course material, for example, the learner might memorise and rehearse information for an examination when gaining a full understanding is seen as impossible. Therefore whilst the ideas of rites of passage are useful to our thinking about a student becoming someone, such as a Biological Scientist, the view of learners contrasts with Winnicott's (1971) transitional space where the learner would have freedom, agency and choice to create it and play within it. Rather, liminality seems to correspond more with Winnicott's (1960b) writing about compliance and false self in which an individual is unable to engage within transitional space, elaborated upon below.

Many of Winnicott's ideas were derived from Darwinian theory but Phillips (1988b) maintains that in Winnicott's writing about early human development he reverses the Darwinian equation by suggesting that 'human development was an often ruthless

struggle against compliance within the environment' (p.5). Compliance is an important concept in Winnicott's theory because he associated it with dependence (*ibid.*). Although Winnicott (1960b) acknowledged that compliance plays a necessary role in maintaining social order and viewed healthy individuals as exhibiting a polite social compliance, overall he thought that if the inner self or outer world of the individual became too dogmatic it would impinge and consequently playing ends and transitional space would collapse. For example, if we are told how a game, story or play will end, the playing stops (*op.cit.*). Thus, if the outer environment impinges on the inner self, transitional space closes down resulting in the false self hiding and protecting the true self by compliance. For Winnicott, rather than inner self being put into relation to the outside in an attempt to comply with the outside, transitional space opens up the potential for learning about the outside without obliterating the inside (Ellsworth, 2005). Winnicott's transitional space therefore, widens our understanding beyond liminal space because it allows us to see, for example, how individuals engage within it, become interested in something new, surprising him or her self with creative play and imagination. Furthermore, his ideas about compliance and false self shed light upon what might impinge upon the individual and hinder their ability to put him or her self into relation with the familiar as well as the different and unknown.

In summary, liminal space has been increasingly used in HE .I have shown how threshold concept theory has furthered our understanding of the difficulties learners might face when grasping conceptual knowledge and that this has been useful to course designers and teachers (Beaty, 2006). However, I have argued that it does not illuminate how individuals might react and cope when faced with difficulty and how

they might develop personally when faced with change. Furthermore, there is little research that has reported individual students' experiences of liminal space, as identified by Entwistle (2008) 'how do students' experience these [threshold] concepts? [...] we need to discover to what extent *liminality* (Meyer and Land, 2005) occurs' (p.32) (original emphasis). It would also seem that the hegemonic nature of the rituals and rites of passage associated with liminal space consequently downplays the agency of the individual whereby they might assert and develop a sense of who they are and what they are capable of. As suggested by Savin-Baden (2008a):

*'[T]he keenness exhibited in the recent literature (for example chapters in Meyer and Land, 2006) for 'embedding' threshold concepts in curricular in an epistemic way, has little ontological understanding of the fact that to do so might be seen as creating a dominant narrative and a means of ritualising disciplinary practice' (p.131).*

It is Maggi Savin-Baden's (2008a, 2008b) concerns about the over generalisability of threshold concepts (see Davis, 2006; Davis and Mangan, 2008) and the disregard that learning is 'biographically and contextually related' (Sain-Baden,2008a: 103) that has led her to develop a paper-based model of transitional learning spaces.

### **Maggi Savin-Baden's model of transitional learning spaces**

The notion of learning spaces mostly concerns the experiences of academics (Savin-Baden, 2008a) yet reference is made to student learning as well. Learning spaces are 'physical' but are largely viewed as 'mental and metaphorical' (p.1) spaces:

*‘Learning spaces are spaces for engagement where often fragmented and disconnected thoughts are able to integrate and become coherent through the creation of different forms of suspension from daily life. In such spaces, individuals may recognise that their perceptions of learning, teaching, knowledge and learner identity are at odds with, or bear little relationship to, their current meaning systems and hence, realise that they have to make a decision about their response to such challenge’ (p.7).*

At first glance a learning space seems to bear similarity to Winnicott’s (1971) space which has a ‘material meaning [... transitional] spaces are both mental and physical’ (Creme and Hunt, 2002:157). However, they contrast in that learning spaces are characterised as liminal because they might be sensed as a between and betwixt space due to the need to create or enter a learning space (Savin-Baden, 2008a). Additionally, not all learning spaces are transitional, transformational, or involve a shift in identity. This is because the proposed spaces are varied and take multiple forms for example, a space could be a metaphorical space, such as a digital space; a writing space; a dialogic space and so forth. In contrast, Winnicott (Ellsworth, 2005) views the individual as constantly emerging and moving in different ways, a key point I return to within the following sub-section. I now explain the model of transitional learning spaces and associated ‘troublesome spaces’ (Savin-Baden, 2008b: 76).

The model of transitional learning spaces represents a cyclic process where a series of ‘learnings’ (Savin-Baden, 2008b: 80) might occur. Within the model the learner embarks upon a ‘troublesome journey’ (*ibid.*) where transitions involve the

movement to different positions and through different spaces, including both learning spaces and liminal space. As I proposed earlier therefore, this model reflects the need to extend our understanding of students' transitions beyond the notion of liminal space.

The learner journey begins and ends with a form of 'proactive learning' that involves a 'leap' (p.109) by the student to actively engage with their learning. This acts as a 'catalyst' (Savin-Baden, 2008a: 95) for change, although there could be many types of catalysts including a 'threshold concept' (Meyer and Land, 2003, 2005, 2006). The catalyst results in 'disjunction' (p.103) and movement into liminal space. Disjunction is seen as involving separation and a:

*'[S]ense of fragmentation of part of, or all of, the self. It is characterised by anxiety and confusion, and a loss of sense of self. This often results in anger, frustration and a desire for 'right answers' (Savin-Baden, 2000: 87).*

The notion of disjunction is useful to my thinking about transitions within HE because it helps to throw new light on the way different students might decide consciously and /or unconsciously to respond to change. Savin-Baden (2008a: 106-107) has identified that individuals choose to respond in different ways to manage disjunction: *Retreating* from the difficulty which involves moving away from further learning and using strategies to avoid engagement with it; *Postponement* involves learners making a clear decision to postpone movement and put an area of learning on hold; *Temporising* involves postponing learning and waiting for an event or stimulus that will help engagement; *Avoidance* in which students do not just



temporise, but also adopt mechanisms that will enable them to evade the disjunction. This will result in bypassing the disjunction which may have taken more effort than actually engaging with it. When learners respond in these different ways they move to liminal space although retreat and avoidance are located on the edge of liminality and temporising and postponement are in liminal space. Savin-Baden (2008b) suggests that liminal space is where a learner will be in a 'liminal state' (p.81) in which I noted earlier, an old identity has been lost and there is an oscillation between different states.

Liminal space might also be where stuck-ness happens when a learner is suspended temporally or permanently. This space therefore seems to also represent a more static place during transition. A way to move away from liminal space involves engagement with disjunction and requires students to acknowledge that it exists and also, attempt to identify the causes. It is during engagement that students are able to shift towards a greater sense of integration and the journey continues over a learning bridge that might help enable shifts into transitional or transformational learning spaces to begin the cycle again.

Overall, the model helps us to understand the different processes and movements that could be involved in individual learning transitions. The model suggests that whilst liminal space might be part of experiences of transition into which students might enter if they are unable to engage in their learning, there are other spaces and positions that extend our understanding of transition. Particularly useful are the ideas about catalysts to change and how students might choose to respond to a sense of disjunction within 'disjunctive spaces' (Savin-Baden, 2008a: 103). However, whilst

some of these ideas aid our thinking, there is little emphasis upon *what happens within* transitional space in the model. Transitional space is viewed as a ‘place where shifts in the learner experience occur [... where] personal change takes place’ (*ibid.*:108) and therefore appears to be a space that learners move through and change within. However there is no emphasis upon what sort of personal change might happen. In addition, in contrast to Winnicott’s transitional space it does not appear to be a space of connectivity. While learning spaces are described as spaces where engagement takes place, as demonstrated in the extract given at the start of this section, engagement appears not to take part in transitional space within the model, rather engagement is a response, a position that learners might shift to prior to entering it. In addition, the model indicates that identity shifts and personal change might take place and the notion of disjunction puts emphasis upon self and emotions, but many other aspects of the model seem to overlook the ontological dimensions associated with being and becoming, that is the ‘self-travel’ (Barnett, 2007:76) aspect of learners’ personal journeys.

In sum whilst the model begins to extend our thinking about transition and how it might be experienced, there are still gaps in our knowledge about what happens in transitional space and what students might ‘do’ during their time there. It is important also to acknowledge that this model presents a number of processes and spaces that a learner might move through and between in an ordered manner. However I will show within this thesis this does not necessarily capture the complexities of the student in transition.

Below, I review the ways that Winnicott's (1971) notion of transitional space throws new light on the experience of transitions in HE by providing a brief comparison of the different spaces reviewed.

### **Extending our understanding about how students' experience transition within Higher Education**

I have examined the notion of liminality and the associated rites of passage and rituals and also the model of transitional learning spaces (Savin-Baden, 2008a, 2008b) that has liminal qualities. I have identified that there seems to be some commonality in terms of these different spaces, for example the transition involves processes that involve separation, transition and integration. In terms of Winnicott's (1971) transitional space and liminal space they are where oscillation, identity shifts, transition, change and transformation are located. In liminal space there is an emphasis upon the physical separation from an old, outer world, but Winnicott (1971) and Savin-Baden (2008a, 2008b) focus upon the inner world of the individual in which the outer world might prompt a sense of unintegration and separation from the habitual and known. Liminal space is a physical, symbolic space (Lam and Pollard, 2006) but Winnicott's (*op.cit.*) transitional space is an intermediate, psychological, physical and social space containing elements of both inner self and outer world. Therefore liminal space seems to be 'out there'; this space has no specified location. In other words, liminal space appears to be moved through and is not 'part' of, or constructed by, the learner.

Liminal and learning spaces are seen as a position that is between and betwixt, yet transitional space is slightly different because it is not a 'discrete entity positioned

between a former self and a future self" (Ellsworth, 2005:35). In contrast it is a space which is 'simultaneous and consubstantial' with the outer, including various events, people, sensations and experiences, thus there is 'differential emergence from a shared realm of reality' (*ibid.*:35). Therefore, rather than an individual being at a fixed point or position, it is more like a 'doppler effect' in which the individual 'smudges' (*ibid.*:122) him or herself, when moving from the self one has been, to the self yet to become. Such a view helps us to see the individual as constantly emerging and becoming, in differential ways, as he or she might put self into relation with the variety of the outer world, as opposed to moving through a constant cycle of learning. I suggest that this is of assistance in the detailed investigation into how students might emerge, develop, change, move and become, when experiencing different and multiple transitions.

Winnicott's (1971) notion of transitional space opens up further possibilities by emphasising that it is the individual who must find it, create it and engage in play within it. In contrast, liminal space does not appear to involve choice on the part of the individual rather it is associated with hegemonic, socially sanctioned rituals and rites of passage. Therefore, Winnicott may provide a more illuminating frame because he allows the exploration of students' experiences of transition from a perspective that views individual learners as having agency and choice. Alternatively, if they are unable to engage in transitional space, students might lack confidence, be dependent and perhaps, compliant and unauthentic. This aids the examination of how learners might respond and cope with transition and what might hinder or facilitate students to engage within transitional space. In addition, it helps us to see if teaching and the learning environment in which it occurs are 'good

enough' (Winnicott, 1971) or 'faulty' (Winnicott, 1960c:18) in the mind of the learner. In addition, whilst learning spaces (Savin- Baden, 2008a, 2008b) appear to involve choice, the notion of creative play (Winnicott, 1971, 1989) allows us to explore what students might 'do' in transitional space. When viewed from this perspective transitional space is a space of connectivity, where individuals respond creatively to the newness and also oldness of the outer world and find the 'bits' (Phillips, 1988a: 86) they can use to bring inner and outer together.

According to Winnicott transition happens when 'we dare to move in relation with the outside worlds of things, other people, environments and events' (Ellsworth, 2005: 30). Thus, Winnicott's space transition has a social quality involving the process of constant movement across the space of difference between inner and outer realities in which we are both interrelated and separate at the same time. This allows consideration of the way students cope and 'stand frustrations and deprivations and the presentation of new situations' (Winnicott, 1950d: 144) and how they might develop and change as they move in relation to outer.

To summarise, I have suggested that Winnicott's (1971) notion of transitional space and play has the potential to extend our understanding of students' transitions within HE. I have discussed how Savin-Baden's (2008a; 2008b) model begins to further our ideas, showing a need to extend our ideas about transitions. Furthermore, I have shown that liminal space might be part of students' experiences of transitions and facilitate our understanding about students who are stuck or have difficulties engaging with epistemological knowledge. Within this thesis I draw upon the notion of liminal space and disjunction to help me to illuminate students' experiences of

transitions when they are stuck and unable to create and engage within transitional space.

Having established the usefulness and limitations of two influential bodies of work on university learning I now turn to the work of Creme (2008) and Creme and Hunt (2002). I have found their work useful to my thinking because they have used Winnicott's theory of transitional space and play to cast light upon how university students' might creatively engage within transitional space during their academic writing.

### **Academic play spaces**

In this final section I introduce the notion of 'academic play' (Creme, 2008) and examine a study by Creme and Hunt (2002) that draws upon Winnicott's work, beginning to establish what might represent a transitional academic play space within HE.

Creme and Hunt (2002) drawing upon Winnicott's (1971, 1989) ideas about play within transitional space, have conducted an action research project in which they provided university students with the opportunity to attend a series of workshops. Here, students were encouraged to develop their creative writing techniques in a variety of ways, and the workshops provided a potential 'play space' (*op.cit.*:156) to encourage students to bring aspects of their inner self into relation with a variety of outer worlds and to play creatively. The workshops were viewed as a move away from 'getting things right' (*op.cit.*:161) to providing 'contained chaos' (Milner, 1971). In this situation a staff member facilitates the direction of the session but it is

also chaotic because ‘she is encouraging participants to contravene the rules, to be subversive, dangerous’ (Creme and Hunt, 2002:161). The researchers were optimistic that as a result of attending the workshops when the students returned to their academic writing such as an essay, it would not be as chaotic, but still possess elements of creative and imaginative play.

Important to this study is the fact that Creme and Hunt (2002) are the only authors who connect Winnicott’s (1971, 1989) ideas about transitional space and play to the conduct of their workshops and in so doing show how relevant his notion of play is to their project. For example, Winnicott (*ibid.*) wrote ‘play gives... control over a limited area’ (p.60). Using this idea, the workshop aimed to allow the students to gain a sense of empowerment in their writing whereby they might increase in confidence and move from writing to satisfy course requirements to play with ‘different kinds of ‘I’ (Creme and Hunt, 2002: 159). In addition, Winnicott (1971) proposed that play is doing, ‘one has to do things, not simply to think of or to wish’ (p.55). During the workshop sessions the authors provided the students with different activities that involved both writing and talking about their writing as they played with various creative writing techniques and for example, different voices. Therefore, using Winnicott’s (*ibid.*,1989) ideas the authors were able to show the different ways that students might play and in so doing help us to establish what defines an academic ‘play space’ (Creme and Hunt, 2002:156). Consequently, in Chapter 6, I draw upon these ideas and give an account of the ways in which the students’ experiences of the module on which my study is based, is relevant to Winnicott’s (1971, 1989) notion of play.

Creame (2008) has recently argued that when writing their learning journals, students are encouraged to be 'playful' by engaging meaningfully with their writing where they 'place themselves as active participants in their learning' (p.55). During transitional journal writing, students are invited to be exploratory with their writing, playing with language and different 'writing identities' (*ibid.*:62). In so doing, they have the potential to forge new connections and move 'inner' self into relation with the 'outer' world. Creame (*ibid.*) proposes that the opportunity for this writing allows students to potentially gain a greater sense of the 'real me' (p.55) and authentic self in their writing. However, this cannot be fully guaranteed because if the demands of writing the journals impinge in the mind of the writer, this might give rise to the compliant false self.

Overall therefore, Creame (2008) argues that learning journals offer the opportunity for transitional academic play that might involve engagement in 'serious and meaningful work' (p.62). Such engagement might give rise to the sense of 'aliveness' (Winnicott, 1971:76), or what could be termed as 'academic love' (Rowland, 2005:96) for their learning.

I draw upon these ideas within this thesis, particularly in terms of the notion of 'academic play' (Creame, 2008:49) and 'play spaces' (Creame and Hunt, 2002:156) to connect Winnicott's ideas to students' experiences of transition in HE. While these ideas have so far been used in terms of students' writing, I have extended their application to different academic play spaces, as I detail in Chapter 6.



### 3.4 Conclusion

In conclusion, I have shown that transitions have been identified as being experienced within different forms of space. Winnicott's theory of transitional space and play was introduced to the reader, followed by a critical discussion about liminal space (Van Gennep, 1960; Turner, 1969) and a model of transitional learning spaces (Savin-Baden, 2008a, 2008b) where I argued that although these concepts shed light on certain aspects of students' experiences of transition and are useful to my thinking, Winnicott's theory provides a more encompassing perspective. Finally, I examined the contemporary notions of 'academic play' (Creme, 2008:49) and 'play spaces' (Creme and Hunt, 2002: 156) within HE which are more closely aligned with the ideas of Winnicott.

In light of the establishment of an overarching theoretical frame to examine how students might experience transition within HE, I provide the three research questions that this study addresses:

- 1. What transitions are experienced by individual second-year undergraduate Biological Science students when invited by teaching staff to engage in potential academic play spaces? How do students react and cope?*
- 2. In what ways do students' 'inner' capacities to play facilitate or hinder academic play? Can students' capacities to play be conceptualised as developing in transitional space?*

3. *Does the provision of 'outer' teaching and learning holding environments facilitate or hinder students' capacities to play within transitional space?*

Chapter 4 now turns to present the research design I employed in order to address these research questions appropriately.

## **Chapter 4**

### **Research design**

I concluded Chapter 3 with a presentation of my research questions. The main purpose of this chapter is to provide a rationale for the research design employed to address those questions appropriately. I argue that a qualitative case study design offers congruence. I begin by discussing that approach and the underlying principles that guided the study. This is followed with details about how the data collection was planned and negotiated, and how attention was given to ethical issues. This is then followed with a presentation of the multiple qualitative research methods I have drawn upon including: the examination of documentation and text; non-participant observation; video methods and semi-structured interviews. Finally, I outline how the data analysis was undertaken.

#### **Section 4.1 A qualitative case study**

The work of Donald Winnicott and his notion of transitional space were detailed in Chapter 3. It is evident from an examination of his work that he drew upon a case study approach involving talking to his patients and / or the use of observations, to gain deeper insights into his patients' psychological problems and experiences. In a talk given to the Oxford University Scientific Society entitled, 'Psychoanalysis and Science: Friends or Relations?' Winnicott (1961) provides an indication to why he thought such methods were the most suitable for his work through the example of a man who comes for analysis because he cannot marry. Winnicott guides us through the complexity of the changes that this patient will experience at different stages during his analysis before finally being cured of his symptoms. Drawing upon this

illustration he argues that ‘statistics would not show these changes’ (p.18). This is an indication that Winnicott thought quantitative methods would cast shadows upon the detailed understanding required in order to undertake his work and make sense of such transitional experiences. I argue below that a qualitative case study is suitable for the purposes of this study.

### **A rationale for qualitative case study research**

As I indicated above, [r]esearch design is governed by the notion of ‘fitness for purpose’ (Cohen *et al.* 2000:73). Within this section therefore, I begin by outlining a number of fundamental characteristics of qualitative research before moving on to consider case study inquiry which underpins this study. In so doing, I explain the reasoning that informed my decision to use this research design.

### **Qualitative research**

Numerous definitions of qualitative research can be located within the literature (Maykut and Morehouse, 1994; Cohen *et al.*, 2000; Denzin and Lincoln, 2000; Bryman, 2004; Silverman, 2005). Creswell’s (1998) succinct description is:

*‘Qualitative research is an inquiry process of understanding based on methodological traditions of inquiry that explore a social or human problem. The researcher builds a complex, holistic picture, analyzes words, reports detailed views of informants and conducts the study in a natural setting’* (p.15).

There are a number of points that are noteworthy in this quotation and require elaboration. First, qualitative research is an overarching concept covering many

forms of inquiry including for example, case study (as outlined later), ethnography, grounded theory, biography and so forth. Such forms of inquiry enable us to understand and explain the meaning of a social phenomenon within natural settings (*ibid.*; Merriam, 1998). Hence, it involves fieldwork in which the researcher physically goes to the people, or site, '[i]f you want to study people in real life, you have to understand them in their context and in the way they operate' (Gillham, 2000:11).

A key philosophical assumption upon which qualitative research is based is that individuals construct reality when they interact within their social worlds and that there are multiple realities that the researcher has to recognise and make sense of (Denzin and Lincoln, 2000; Creswell, 1998). Thus, the investigator must spend many hours within the field, usually collecting extensive amounts of data. This approach was essential for my study because it called for methods that would enable me to gain a deeper understanding of the students' different experiences. In addition, by spending time in the field where I made observations, examined documentation and text, undertook video collection and conducted four phases of interviews over a period of twelve months (see Table 4.1 p.75), I aimed to gain insight into the past, present and likely futures of the different students; a fundamental requirement for understanding their transitions, as opposed to a one-dimensional 'snap shot'. By using a longitudinal approach I aimed to grasp the complexity of the different transitions taking place over time. I also considered that by seeing the students regularly, face-to-face, I might build a rapport with them and come to be seen as a familiar presence within the field and less of an 'outsider'.

With this aim in mind I endeavoured to understand the students' experiences from their perspective, sometimes referred to as the 'emic' (Stake, 1995:20) or insider's perspective, rather than from my own. This points to a further characteristic of qualitative research, in which the human researcher's role involves acting as the primary instrument for the data collection and analysis, as opposed to a more remote method such as an inventory or questionnaire. In this role therefore, a qualitative researcher is viewed as gaining a closer understanding of the participant's perspective (Denzin and Lincoln, 2000) and is sensitive to the context of the study in which techniques might be adapted to adjust to emergent or varying circumstances. Thus, through having this flexibility the researcher can maximise opportunities for collecting and producing meaningful information (Merriam, 1998). By using a research design whereby I sought to capture each student's narrative account I was responsive to the idiosyncrasy of his or her experiences by adjusting and individualising the questions posed to the students during the progressive data collection phases.

Finally, another characteristic of qualitative research is that it has an exploratory and descriptive focus and produces an in-depth view of the topic. Because words and visual images are examined as opposed to numbers, the final report includes a detailed description which can include for example, direct citations from transcriptions, documents, or video images. This descriptive focus is a particular characteristic of case study narrative where Stake (1995) suggests the reader will be provided with the opportunity for a 'vicarious' (p.63) experience.

## Case study inquiry

Case studies frequently involve quantitative methods for example Yin (1994) advocates both a qualitative and quantitative approach, but a qualitative approach as outlined above, is more likely to provide a deeper understanding of the case(s) (Merriam, 1998). Creswell (1998) has highlighted that a case study may be defined and viewed in different ways. For example, Merriam (*op.cit.*) considers it to be a methodology, whereas Stake (1995) regards a case study to be a choice of what is to be studied. However, whilst there are different perspectives, overall it is clear that the focus of the research is upon the case(s) and in my study each student is a 'case'. What makes a case study distinctive is that it is treated as a 'bounded system'. In this study the cases were defined as being bounded firstly by the focal point of the enquiry, which is an exploration of the second-year students' transitional experiences of their study of a Biological Science undergraduate degree. The main focus being upon their study of a module delivered at the start of the second-year course. Thus, the cases were also bounded by place that is, specific teaching and learning environments on a university campus. Finally, the cases were delimited by time, as the data collection took place over a period of twelve months, from the beginning their second year of undergraduate study (October 2006), to the start of their third year (October 2007).

A case can be a single instance or subject of study, but a number of cases can also be studied, and when this is done it is called a 'collective' (Stake, 1995:5) case study. It is the use of multiple cases which is commonly used as a strategy for enhancing the confidence of the findings (Miles and Huberman, 1994). By using a case study where I could focus upon the particular, I determined that it would enable me to gain a

fuller understanding of the transitions made by different students. Thus, a collective case study, where each of the eight students participating in the study represented a bounded case, was adopted. This also allowed me to compare the students' transitions.

It is also important to consider that the interest in the case may vary and could be either intrinsic or instrumental (Stake,1995). An intrinsic case study involves an interest in a specific case because of its uniqueness in illustrating a particular trait or problem for example, a child, a clinic or a curriculum. In contrast, an instrumental case study involves the case being of secondary importance because it is identified to illustrate an issue enabling the researcher to gain a deeper understanding of matters relating to that issue. It is the latter of these two alternatives that corresponds closest to the aims of this study because the individual student cases were viewed from the outset of the research as being instrumental to increasing my understanding of the students' experiences of transition within Higher Education (HE).

Typically then, a case study is an in-depth, detailed and holistic study of a specific phenomenon (Creswell, 1998). In order to achieve that aim, as in other qualitative research referred to earlier, the data collection is conducted over a prolonged period of time, usually taking a longitudinal approach (Bryman, 2004). In addition, the data collection incorporates a range of multiple sources of information, rich in context, such as: observation, interviews, audio-visual material, documents and reports. Gillham (2000) suggests that the heart of the case study method involves 'the collection and study of multiple forms of evidence, in sufficient detail to achieve understanding' (p.19). A key advantage of taking this approach is that it can be used



for the purposes of triangulation, a term originally taken from surveying (Stake, 1995) involving the pinpointing of a location by the use of a number of different measurements from different angles of vision. By adopting this approach, information can be corroborated and if they converge there is increased confidence that the different sources shed light on a particular theme or perspective. This also increases the trustworthiness of the case study (Creswell, 1998; Miles and Huberman, 1994; Cohen *et al.*, 2000). Thus, I considered triangulation to be a key aspect of case study research, and in Section 4.2 I outline the multiple methods of data collection I used, plus the systematic analysis of areas of convergence and contradiction I undertook to increase the credibility of the study.

In the sub-sections above I have focused upon the more positive aspects of qualitative case study design, yet it is also important to understand the limitations inherent in its use. The key concern when conducting qualitative case study research, especially a single case, is that of the external validity, or generalisability of the cases (see Silverman, 2005; Bryman, 2004; Bassey, 1999). This relates to the extent to which a finding in one setting can be applied more generally. Part of the problem lies in thinking about generalisability in the same way as scientific or statistical generalisation (*ibid.*) as illustrated by Arber (1993) when writing about quantitative research, '[t]he purpose of sampling is usually to study a representative subsection of a precisely defined population in order to make inferences about the whole population' (p.38). But the problem is, 'how do we know [...] how representative case study findings are of all the members of the population from which the case study was selected?' (Bryman, 2004:51). This has led some commentators to view generalisation as an unessential outcome of case study research (Bassey, 1999). For

example, Stake (1995) agrees with many critics that qualitative methods cannot claim confidently to generalise from a case, but he argues that it is possible to use a process he developed with Deborah Trubull called ‘naturalistic generalisation’ (p.20). This involves knowledge about the cases which could be for example individuals, being transferred from the researcher to the reader through the rich, descriptive narrative report. Therefore, it is the reader who decides if findings from one study can be taken and applied to a similar situation. Hence, the emphasis is upon the transferability of knowledge, as opposed to generalisability.

Similarly, Bassey (1999) put forward the use of ‘fuzzy generalisations’ (p.46) as an alternative to those derived from statistics. Fuzzy generalisations are based more upon the idea that predictions arising within the empirical findings state that something might happen, but they do not provide a measure of probability. Thus, fuzzy generalisations carry ‘the idea of possibility, but no certainty’ (*ibid.*:46). Therefore this study does not claim that the empirical findings are generalisable in the same way as statistical or scientific traditions, with such a small sample it would be meaningless; rather it is aligned with the alternative approaches put forward above where the participants are viewed as individuals.

This section has outlined a rationale for the use of a qualitative case study design, including the key principles, which underpin this study. I now discuss the conduct of the inquiry and the multiple qualitative methods employed.

#### **4.2 Conducting the qualitative case study**

As stated in Section 4.1, I employed multiple qualitative research methods with a

view to conducting a holistic analysis (Creswell, 1998). In this section I outline: the different methods used; the ways in which they were undertaken; their associated limitations and how these were addressed; and the ways in which the data was analysed. I begin by discussing the multiple methods used in the study, the different phases of the case study and the amount of data collected within the Table 4.1. overleaf.

The case study involved research methods that included the examination of documentation and text and non-participant observation of all the lectures and laboratory classes that provided contextual data. The main focus of the data collection therefore, involved the conduct of four phases of semi-structured interviews and also video-session interviews carried out at the end of the fieldwork. The research methods are detailed later in this section after I have described the initial stages of the inquiry and the preparation for the main research study.

**Table 4.1**

<b>Date of data collection phase</b>	<b>Fieldwork activity and research methods</b>	<b>Data collected</b>
<b>Phase 1</b> October and November 2006	<ul style="list-style-type: none"> <li>• Accessing students and gaining informed consent</li> <li>• Non-participant observation</li> <li>• The first phase of interviews, including an interview with the Course Convenor* (acting as an informant)</li> <li>• Video recording in the laboratory**</li> <li>• Examination of documentation and text</li> </ul>	<ul style="list-style-type: none"> <li>• 13 hours of interview data</li> <li>• 21 hours observation / 13 pages of word processed notes</li> <li>• 5 hours of video data</li> <li>• 8 letters</li> <li>• 7 student handouts</li> </ul>
<b>Phase 2</b> December 2006 to February 2007	<ul style="list-style-type: none"> <li>• Conduct the second phase of interviews</li> <li>• Non-participant observation</li> <li>• Examination of documentation and text</li> </ul>	<ul style="list-style-type: none"> <li>• 11 hours of interview data</li> <li>• 5 hours observation / 4 pages of word processed notes</li> <li>• 8 letters</li> <li>• 2 student handouts</li> </ul>
<b>Phase 3</b> April and May 2007	<ul style="list-style-type: none"> <li>• Conduct the third phase of interviews</li> <li>• Examination of text</li> </ul>	<ul style="list-style-type: none"> <li>• 10 hours of interview data</li> <li>• 8 letters</li> <li>• 8 scientific reports</li> </ul>
<b>Phase 4</b> October and November 2007	<ul style="list-style-type: none"> <li>• Conduct the fourth phase of interviews</li> <li>• Conduct video-session interviews</li> <li>• Examination of text</li> </ul>	<ul style="list-style-type: none"> <li>• 10 hours interview data</li> <li>• 8 letters</li> <li>• 4 hours video session interview data</li> </ul>

\* The Course Convenor was interviewed again in March 2008

\*\* The video collection took place in week 6 and 7 of the module. See Table 6.1 for module timetable

### **Data collection phases and associated research methods**

#### **Planning the case study**

Planning for the main research study involved the conduct of a small-scale pilot study in May 2006. The value of a pilot study cannot be overestimated (Blaxter *et al.*, 1996) because during the research process things may not necessarily work the way you envisage, despite meticulous organisation. The main objective of the

preliminary study was *not* to report the experiences of the four students taking part, rather the main intention was to begin to gain an understanding of the different transitions that a number of second-year Biological Science students might face when studying the module Analysing Data and Designing Experiments (ADDE). The aim was also to test as many of the proposed data collection instruments as possible. However, because the pilot study was conducted at the end of May, a time that coincided with the completion of the students' second-year of study, it was limited to the use of just two data collection methods that is, semi-structured interviews and the examination of documents and text. A brief overview about the pilot study is provided, but before I could begin collecting any data it was necessary to consider any ethical issues that might arise, in order to ensure that the pilot and main study were conducted in an appropriate manner. I now discuss those ethical issues and the negotiations leading to gaining access which are relevant to both the pilot and main study.

### **Ethical considerations**

During the organization of this research study, attention was paid to the ethical guidelines for educational research, as outlined by the British Educational Research Association (BERA) (2004). Ethical issues were also considered during the completion of a statement of research ethics, required for approval by the University of Nottingham. The statement of research ethics was submitted in April 2006 and was approved in May 2006. Below I discuss the key issues that required attention in order that the study could be undertaken in an ethical manner.

Most social research requires obtaining the consent from subjects who are going to

assist the inquiry (Cohen *et al.*, 2000). Prior to the students agreeing to take part in the study they were provided with information sheets. This included the purpose and aims of the study, the data collection methods, an offer to answer any questions about the research and information about the students' right to withdraw from the study. I initially informed the students about the study in a short email circulated on my behalf by administrative staff to ensure the confidentiality of the students, and I attached information sheets for their perusal. When students expressed their agreement to take part in the study, either face-to-face or by email, they were given a consent form on which their agreement to take part was provided by way of a signature. By providing their signature the students also: confirmed that they had been provided with information about the study and had been offered the opportunity to ask questions about the research; acknowledged that they could withdraw from the study at any time; gave permission for their interviews to be audio-recorded provided that the recordings were destroyed and files on computers erased upon completion of the study. A copy of this consent form is located in Appendix 1. My signature was also added. A Course Convenor also took part in the study and he signed to give his consent after being provided with information about the study. The Course Convenor also gave me permission to conduct the study and gain access to the students and this is detailed later in the sub-section 'Negotiating and gaining access'.

Another ethical concern relevant to this study concerns the respect of the participants. Rights for the participants' confidentiality was particularly pertinent to the main study where individual student's experiences are reported, although students taking part in the pilot study were also guaranteed confidentiality. It was considered that all the students' identities should be protected in order that they

might feel more at ease to talk candidly and perhaps even critically about their experiences. Therefore, the assurance about confidentiality was confirmed with the use of pseudonyms. When the students had provided their consent to take part in the study they were offered the opportunity to choose a pseudonym. The reason behind this being that I would provide reassurance that I had every intention of ensuring their confidentiality.

Further ethical issues are discussed within relevant sections of this chapter. I now detail how access to conduct the case study was planned, negotiated and conducted.

### **The research site**

As noted above, a key matter of importance was the protection of the identities of the students and the Course Convenor, who also contributed to the data collection. Therefore in an attempt to further ensure the participants' confidentiality, the site of the research is not disclosed and has been named as 'Hill Mount' University. However, I do provide very brief details, relevant to this study.

Hill Mount University is part of the Russell Group and therefore, claims a commitment to achieving excellence in research and the highest standards in teaching and learning. This commitment is demonstrated within a University Plan (2007- 2010)<sup>9</sup> in which it is outlined how the university aims to offer the highest quality experience for all students. Overleaf, I provide grounds as to why I conducted the research at this particular site.

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<sup>9</sup> This is not referenced to ensure confidentiality.

As I noted in Chapter 1, this study is built upon previous research undertaken for my Masters degree. After consultation with my supervisors I decided that this research would be conducted at the same university site. The main reasons for this were firstly, that I had become familiar with many aspects of the students' first-year experience and therefore, it was thought that this might aid me to have a better understanding of the second-year students' possible prior experiences. Secondly, as with most research, the planning and organisation of a case study can present many difficulties (Bassey, 1999; Cohen *et al.*, 2000). The advantage of previously conducting research at this site was that I was familiar with establishing access to 'gatekeepers' (Bryman, 2004:518-519) that is, two members of staff within the Biological Sciences Department. In so doing, I had determined that contacting these staff members via email had been an effective method. In addition, I had begun to know members of the administrative staff who helped me to book rooms on campus for conducting interviews, and to circulate an email about the study to prospective students, as noted earlier.

Hence, I began the process of negotiating and gaining access.

### **Negotiating and gaining access**

Gaining access to sites or individuals involves several steps and it can be a lengthy and sometimes difficult process. Care was taken therefore to follow the advice offered by Cohen *et al.* (2000) in which you should 'never assume it will be alright' (p.57). Consequently, every effort was made to ensure that appropriate ethical procedures were followed.



The negotiations for the gaining of access were overt (Maykut and Morehouse, 1994) and through official channels that is, the Course Convenor (whom I have named George<sup>10</sup>) for the module Analysing Data and Designing Experiments (ADDE)<sup>11</sup> was contacted via email about the study. This included a short description about the research and purposes of the study. In addition, I explained why I had contacted him and my interest in the module. My contact details were given and George was invited to respond to my email in order to receive more information about the study. George responded swiftly and suggested we meet me face-to-face to discuss access. Prior to the meeting, I sent detailed information about: the research design; the proposed data collection instruments; the information sheets and consent forms that I would be distributing to the students.

Access to the second-year Biological Science students for the pilot and also the main study was agreed following a meeting with George in his office, lasting approximately one hour where the proposed research was discussed at length. During that meeting, a main concern George raised was about the issue of respect for the prospective students taking part. To elaborate, George commented that the students should be compensated for their time and commitment to the study through small monetary payments. I was able to confirm this was possible because I had previously raised this matter with my supervisor and it had been agreed that I would use funding provided by the Economic and Social Research Council (ESRC) Research Training Support Grant (RTSG) for this purpose<sup>12</sup>. It was agreed that for the main study, I paid the students £15 each for taking part in a data collection phase that included an

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<sup>10</sup> This is a pseudonym and these have been used for all participants in the study

<sup>11</sup> The name of the module has not been revealed. This title has been constructed by myself

<sup>12</sup> The Economic and Social Research Council (ESRC) stated in the student handbook (2006) that the RTSG might be used for small monetary payments to key informants.

interview and writing a letter to a friend, as shown in Table 4.1. The five students who participated in the video-session interviews were paid a further £10. Students taking part in the pilot study were paid £15 each. Following a discussion in which a small number concerns were addressed as outlined below, consent to gain access to conduct both the main and pilot study was provided.

Permission to conduct the research was subject to a small number of requirements recommended by George, which I addressed, as follows. Firstly, I was required to provide confirmation that the University of Nottingham as noted previously, had approved the statement of research ethics. Upon receipt of this, I was able to commence the pilot study. Additionally, further permission to conduct the research was requested from the Department's Director of Teaching and Learning and this was granted through email communications. With regards to the conduct of the pilot study, I was given permission to access current second-year students who had previously studied ADDE. However for the purposes of the main study I was informed that because the students studying the module were divided into three separate classes during the laboratory sessions, access would be restricted to the students attending George's class which amounted to approximately fifty students.

In addition I was asked to make assurances that the study would result in minimal interference with the students' everyday study, a key point any researcher should be sensitive to when planning a study of this kind. As a way of addressing this for example, I arranged interviews at times the students suggested would suit them best and in addition, I endeavoured to conduct the interviews at locations close to where they were studying on campus. The aim of this was that students could fit the

interviews easily around their lectures and classes at times that suited their individual arrangements. Finally, I was requested to make it clear to the students, both vocally and in information sheets, that participation in the study was not connected to, nor would it influence the marks awarded for the assessment of the module.

As well as acting as a gatekeeper, George gave his permission to take part in certain aspects of the data collection, including being interviewed on two occasions and also, being filmed during the audio-visual collection. The views of George were sought because it was seen that he could act as a spokesperson, or what Stake (1995) terms as an 'informant' (p.67) on behalf of the Biology Department because he was particularly knowledgeable about: the second-year students who study the module; how the course has been developed, planned and delivered; how the course was assessed; and the difficulties and challenges the students might face; and provide insights into the possible transitions that the students might experience during their study of this module. The overall aim to include George's perspectives therefore was to gain a more holistic understanding of the student cases.

### **Selecting the cases**

The selection of the cases for both the pilot and the main study was purposeful sometimes called purposive (See Merriam, 1998; Cohen *et al*, 2000; Bryman, 2004). This is an approach commonly used by many qualitative researchers (Denzin and Lincoln, 2000). Purposeful sampling was viewed as appropriate because, as the name suggests, individuals are selected for a specific purpose where the researcher seeks people who are relevant to the research questions. The purposeful sampling therefore, aimed to select second-year Biological Science students studying the

module ADDE and in terms of the main study, those in George's class. My aim therefore, was to include a range of participants I could view as individuals. In addition, the main study included an element of 'snowball, chain or network' (Merriam, 1998:63) sampling where students, who had agreed to take part, referred me to other prospective participants. I did not ask this of the students, but two students discussed the study with others within their group who in turn, contacted me expressing an interest in taking part. Thus, the sampling to some extent was also opportunistic (Cohen *et al.*, 2000; *op.cit.*). However, because some of the participants volunteered themselves to take part in the study, an element of self-selection was involved. Hence, it must be recognised that they might have had various personal reasons for taking part in the research.

Upon completion of the pilot study, I was able to re-consider if focusing upon one module would indeed meet the study's aims. In light of the emerging empirical data, it was agreed with my supervisors that it would. Further, the number of cases on which to base the main study was a key consideration. This was resolved by balancing the amount of work to be undertaken by a single researcher with the required depth of understanding needed about each of the cases. The pilot study had included four students, providing me with an idea of how much the work would involve and I decided that 8-12 students would be a realistic number. Initially, ten students provided their consent to take part in the study, but following the first phase of the data collection two students took no further part and their experiences have not been included in the thesis. One student withdrew because of the illness of a family member. The other did not turn up for the second interview appointment, and subsequently did not respond to my text and email communications. The study

therefore includes the experiences of eight student cases along with the perspectives offered by the Course Convenor.

When access was agreed and confirmed the students were informed about the pilot study and later in the main study, by way of an email, which was circulated on my behalf by an administrator within the Biology Department. This approach was adopted because it ensured the confidentiality of all the second-year students who were contacted.

This sub-section has covered the preliminary details of the study, including issues around informed consent and negotiating access. The following section provides information about the pilot study and the two research methods employed. I also highlight the changes I made for the conduct of the main case study.

### **The pilot study**

The pilot study included four second-year students who had studied the module ADDE at the start of their second-year. As I indicated earlier, the key purpose of the study was to test the research methods with a view to identifying and addressing any limitations. I will now discuss the data collection methods and the refinements I made for use in the main study.

### **Letter to a friend**

The use of personal documents such as letters and dairies rarely receive attention by social researchers (Bryman, 2004). In the pilot and main study the students were asked to generate such a form of documentation, by way of writing a 'letter to a

friend' (Biggs, 2003:196) prior to each interview. This idea had been recommended by Biggs (*ibid.*) as a form of assessment / evaluation in which the student writes about their particular experiences to a friend, either imaginary or real, who is considering studying the same course in the future. Writing a letter to a friend has also been recommended by the Learning and Teaching Support Network (LTSN) (2004) as a useful technique for gaining feedback from students. The use of letters as a source of data collection had originally been prompted during the study I conducted in 2005, to fulfil the requirements of my Masters degree study. Prior to the students' interviews I had become aware through face-to-face conversations and email communications that the students seemed to be slightly apprehensive about the questions I was going to ask them. Consequently, I decided to use writing a letter as a means of preparing the students for the interview and hopefully, put them more at ease. Having made that decision, I emailed the students with a small number of questions that their hypothetical 'friend' was especially interested in and would like to hear about. The themes of the questions were connected to the main questions within the interview guide I had devised and the students were informed of this. The adoption of this approach enabled the students to become familiar with the type of questions I would be asking them, and gave them time to consider their responses before talking to me directly. Additionally, it was made clear to the students that they were free to include any information about their experiences that they thought was important, but hadn't been asked by me to write about. Hence, the design of the letter writing mirrored that of the semi-structured interviews, outlined below.

After the pilot study I further developed the use of the letter in the main study. Key improvements included making sure that the students were sent information about

the letters when the interview dates were being arranged, or confirmed. This gave the students plenty of time to write the letters - usually a period of two weeks - so that the task would have minimal impact on their day-to-day study and allow time for me to respond to any questions they might ask. In the event, only two minor queries were raised about the letter during the course of the main study. Another refinement from the pilot study was to ask the students to write letters which filled one side of A4<sup>13</sup> paper in length, although they were told that they could write a longer letter if they wished to do so. During the pilot study no such guidance had been specified, and two of the resultant letters were much shorter than anticipated.

### **Semi-structured interviews**

Interview methods are commonly used to research HE (Tight, 2003) and are frequently undertaken in small-scale educational research (Drever, 1995). Interviewing was used as a key data collection instrument in the pilot and main study because it presented the most direct way to ask the students about their individual experiences and therefore, address the main research questions. As pointed out by Kvale and Brinkmann (2009):

*‘If you want to know how people understand their world and their lives, why not talk to them? Conversation is a basic mode of human interaction...Through conversations we get to know other people, learn about their experiences, feelings and attitudes, and the world they live in’.* (p.xvii)

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<sup>13</sup> Guideline specified as: size 12 font, spacing 1.5

Since the overall aim of the interviews was to provide the students with the chance to talk in detail about their experiences, I decided that the interviews should be semi-structured. This made it necessary to plan in advance the general structure of the interview and construct the main questions to be asked. The detailed structure of the interview was then worked out during the interview where the students were provided with opportunities to construct answers at length and in their own words to a series of pre-determined open-ended questions. I then responded using prompts that facilitated broader coverage of a question, and probes aimed at exploring answers in greater depth (Drever, 1995). In this interviewer role therefore, I took on elements of Kvale and Brinkmann's (2009) two metaphorical interviewers that is, a 'miner' and a 'traveler' (p.48). Firstly the miner interviewer unearths nuggets of knowledge out of the interviewee's experiences. This is done through the use of probing questions, which avoid asking leading questions. The second metaphorical interviewer is a traveler on a journey to a distant land in which prompts and open-ended questions allow unknown territory to be explored, where people are encouraged to talk about their world and experiences. The traveler then returns with a story to tell.

Overall the interviews went well for the pilot study. The four students taking part were interviewed at times convenient to them at the university campus in a landmark building that was easy to find and close to where they were studying. Each interview lasted just over one hour. I was able to gain in-depth accounts that helped me to start to understand students' transitional experiences when studying the module ADDE. Nevertheless, the pilot study was limited because it involved students being interviewed on one occasion where only retrospective accounts were gained. As a result I was unable to capture the dynamics of change that is, the flows into and out



of particular stages of the students' study and the transitions between them in 'real time'. The main study therefore, was planned accordingly to overcome this limitation, taking a longitudinal approach in which it was arranged to interview the students on four occasions as they were 'tracked' during their study of ADDE and beyond in order to gain retrospective accounts. During the pilot study it also became evident that I needed to give more consideration as to how I might help students feel more at ease during the interview process. In section 4.3 I detail how I addressed this in the main study.

In summary, although limited in scale, the pilot study provided me with feedback that enabled me to refine my data collection methods and to plan my main study. I will now discuss the research methods used in the main study, indicating any changes I introduced in light of my pilot study.

### **4.3 The research methods**

This case study drew upon a number of research methods, the aim being to gain deep and holistic insights from the students' experience. Four main data collection methods were adopted when conducting the main study, all of which were drawn upon during the data analysis in order to provide a detailed view of all the cases, as presented within the empirical chapters. However, the observation methods and the examination of documentation of text provided more contextual data, and were used to feed into the other research methods employed, discussed below.

#### **The examination of documentation and text**

The examination of documentation and text is a method of data collection frequently

undertaken by qualitative case study researchers as part of an extensive multiple method approach (see Stake, 1995; Merriam, 1998; Creswell, 1998; Gillham, 2000). The key advantage of the use of documentation is that the presence of the researcher does not intrude or alter the setting in any way, plus it provides an easily accessible source of data (Merriam, 1998). This method was employed because it was determined that the use of relevant course material, such as handouts and also documentation generated by the students in the form of letters and copies of their submitted scientific reports, would provide yet further insights. An account of the two main forms of documentation and text are presented below.

Course documentation that I had been unable to examine in the pilot study was accessed on-line via WebCT and also, as handouts distributed during both laboratory classes and lectures. This was useful for gaining a grasp of the module as a whole and in addition, a fuller understanding of the different transitions that the students might experience. To illustrate, course documentation included information about: the aims of the course and the expected learning outcomes; how the course is planned and implemented; recommended additional reading and useful 'starter' references; lecture material; and guidance provided to the students; information about the assessment. The documentation also acted as a useful resource when constructing the interview guides.

The students provided letters to a friend prior to each of the four interviews. With refinements applied after the pilot study, overall the letters to a friend were found to be beneficial to the data collection in a number ways. As indicated earlier, they provided the students with the opportunity to be prepared for the interview and aware

of the type of questions they were going to be asked. In addition, information detailed within the letters was subsequently incorporated into the interview guide, so that each student's questions were personalised accordingly. These were then probed and discussed further, during the interview. The letters also acted as a useful indicator that the students had remembered their interview appointments. It was requested that letters were sent by email at least one day before their interview. Upon receipt I had the chance not only to thank the students for their letters, but also to confirm time and dates via email, or text. However, whilst this method did help to affirm interview appointments, it is important to note that the process was not entirely successful and it has to be acknowledged that part of the data collection process involved waiting for students who unfortunately failed to turn up, or were late. Whilst a researcher may endeavour to minimise such events, there are everyday happenings such as a sudden illness, students sleeping in, or missing a bus and so forth, that must be viewed as an unavoidable part of conducting such research.

The second form of student-generated text was their individual scientific reports, which they were required to submit for assessment purposes. Copies of their reports plus feedback provided by the Course Convenor George, were used as a prompt during the third phase of the interview process, so rather than just relying upon the students' recollections of their report writing they were able to refer to specific parts of their reports and talk about them in greater detail. This helped gain further insights into the transitions the students experienced whilst conducting their experimental work, analysing their data and writing their reports. Thus, documentation and text were used for the purposes of 'stimulated recall' (Mann, 2003:216) which as the name suggests, aims to enable participants to bring back to mind what happened in

the past, in order that the researcher can explore such issues further. Bloom (1953) was the first to develop the use of stimulated recall in which he played short clips of audio recordings of lectures and discussions to students in order to understand their thought processes. Recently Mann (2000, 2003) has further developed this method for example, in her study of students' experiences of academic reading (*ibid.*,2000). The students were asked whilst they were reading to mark their pauses within text. These pauses were then reviewed and explored further during the interview process in order to gain insights into how students' reading is disturbed within an academic context.

In a further study, Mann (2003) used a different approach in which video recordings of classroom events were played to both students and a lecturer in order to stimulate recall about their learning and teaching experiences respectively. Their different experiences and perspectives were then compared and contrasted. A similar method was also used in this study where audio-visual recordings taken within the laboratory were later shown to a number of students to stimulate recall and gain further insights into their experiences, as outlined later.

Having outlined the use of documentation and text which acted as valuable artefacts in aiding me to gain further insights, I will now discuss how non-participant observation was used to obtain additional contextual data.

### **Non-participant observation**

Observation methods were employed throughout the presentation of the module ADDE. Stake (1995) has argued that through observations the researcher is enabled

to gain a greater understanding of the case(s) and therefore, the key aim of undertaking observations in all ADDE's classes, including laboratory classes and lectures, was to gain a sense of what it was like to be a student studying this module. The intention overall was *not* to report detailed observations, rather to include some of them within the interview guides and ask the students directly about them. By providing the students with the opportunity to comment upon my observations therefore, I sought to grasp the emic or insider's perspective, as referred to in Section 4.1 and hence, complement the evidence gathered by the other methods for the purposes of triangulation.

My role when conducting the observations was non-participant and this enabled me to be a 'complete observer' (Cohen *et al.*, 2000:305). However, as stated by Alder and Alder (1994) all research is a form of participant observation because we are unable to study the world without being part of it. For example, during the observations some of the students would come to talk to me, or ask me for experimental equipment located near to where I was sitting. I viewed this as a positive part of the research because my presence helped to gain a rapport with the students and also it aided the data collection by providing the opportunity to confirm interview dates and times.

My observations of each class were recorded using a semi-structured observational schedule. This schedule structure was based upon recommendations made by Merriam (1998) to include key observations about: the physical setting; activities and interactions; and subtle factors such as informal and unplanned activities and what does *not* happen. Although I had worked out a general scheme in advance, I also had blank sheets to record unplanned observations that I had not previously considered.

The field notes were then written up as soon as possible in order to maintain the reliability of the findings (Gillham, 2000). During observations in the laboratory I remained at a bench at the side of the room, away from the teaching area, but close to students conducting their experiments. From this position, I had a good view of the classroom as a whole and was able to gain an understanding as to what it was like to be a student in the laboratory, without intruding on their activities.

During the observation of lectures I sat amongst the students within the lecture theatre. I found that within the lecture environment it was easier to be a 'fly on the wall', as there was little interaction and students sat and listened to the lecturer. This was in contrast to the laboratory which appeared to be a more sociable place, because the class size was smaller and students were busy with their experimentation, walking around and also, talking to each other and staff.

Whilst I have focused upon the positive aspects of this method of data collection it is also important to note its limitations, especially the fact that it is impossible to capture and record accurately every event, or everything that is said. A method that can be used to capture a more complete record is audio-visual collection (Cohen *et al.*, 2000). This represented a move away from the contextual observations towards more particular data collection about the different cases, as outlined below.

### **Audio-visual collection**

As pointed out by Mann (2003) research into teaching and learning in HE has tended to be conducted outside the classroom and there is little work that observes and understands different processes within the classroom context. That said, there are a small number of exceptions, for example Tapper's (1999) study of science students'

talk within the laboratory. Therefore, as well as observation I also employed video collection where use was made again of the stimulated recall method, as discussed previously. One key reason this method was undertaken was because upon review of the pilot study it was determined that the students often experienced difficulty in remembering their experiences in detail during the interviews, especially in terms of their experimental work within the laboratory. Consequently, I thought that this method might stimulate recollection and illuminate data about the students' transitional experiences that could not be captured by conventional interview and observational methods alone.

At the start of the study when I talked to the students I provided them with written information about video collection. During my meeting with George when discussing data collection methods, I was advised that the filming would have to be limited to those groups experimenting with flies or crickets due to a Home Office regulation that states that any filming involving experimentation with animals must be limited to invertebrates. Therefore I approached relevant students<sup>14</sup> who had consented to take part in the study and as a result six students who were working within two separate groups stated that they would like to be involved in the audio-visual collection. All the students who were filmed provided their informed consent to take part in this further method of data collection, both orally and by way of a signature. As noted in Table 4.1 (p.75) this data collection was conducted in weeks 6 and 7 of the module, when the students were conducting experiments relating to their mini-projects in the laboratory.

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<sup>14</sup> Two students taking part in the study could not contribute to this part of the research because their experimental animal was a chick. Another student who was working with crickets declined to be filmed. See Table 7.1 for details about the students' experiments.

Overall the students were provided with a period of 4-6 weeks to consider their involvement. The filming concentrated upon one group during each session and was undertaken by a professional cameraman who was experienced in video recording within educational settings. One group (*Group 1*) was filmed in week 6, worked with flies and included two male students taking part in the study. The other two male group members also provided consent to be filmed following a face-to-face discussion with me when I answered any of their queries. The second group (*Group 2*) was filmed in week 7 and worked with crickets. All four female members were taking part in the study at this time, although one individual withdrew at a later date.

During the video recording it was important that I recognised that the filming was overt. Thus, I took the view forwarded by Pink (2001) who draws attention to the 'reflexive' (p.2) position, which entails an awareness and sensitivity to the researcher's impact on the visual images. Such an approach is frequently collaborative, in which those who have been filmed are also involved in how the visual images are interpreted, as discussed below.

When the filming was completed I was provided with DVDs of the recordings which were subsequently viewed repeatedly and in detail. This was a time-consuming process as the data amounted to just over five hours in length. From each recording a number of data clips were selected. Approximately 8-10 clips were selected from each video recording varying in time from a few seconds to around three minutes. The choice of clips was driven by: data previously gathered during interviews or observation; the theoretical framework; and, new and emergent aspects of the students' experimental work not previously explored. The selected clips were then



put onto separate DVDs. It was arranged to show the corresponding DVD to the students taking part in the study within their groups (*Group 1* and *Group 2*) in video sessions, where the clips were used to stimulate recollection of their experimental work. The students were then asked to comment upon the clips. Details of how the video-session interviews were conducted are included within the sub-section below.

### **Semi-structured interviews**

As I noted in the Section 4.1, in the pilot study I conducted semi-structured interviews as a key method of data collection. For the main study I undertook four interview phases structured around key themes that connected to the students' transitions. These categories (Merriam, 1998) were derived from a combination of working between the course documentation, the emerging data and the theoretical literature. The key categories are outlined in Table 4.2 overleaf.

**Table 4.2**

Interview phase	The key categories in the interview guides
One: October and November 2006	<ul style="list-style-type: none"><li>• Past experiences of A-level study and the transition to the first-year of university.</li><li>• Personal thoughts on the module ADDE - moving into a new and different teaching and learning environment.</li><li>• Experiences during the first two weeks in the laboratory and the creation of an experimental design.</li><li>• Expectations of the study of the module.</li></ul>
Two: December 2006-February 2007	<ul style="list-style-type: none"><li>• Students' experiences of transition in terms of: 1.Their creative group project: 2. Creating and conducting an experiment; 3. Oral presentations and working with others; 4. Data analysis; 5.Scientific report writing.</li></ul>
Three: April and May 2007	<ul style="list-style-type: none"><li>• As the five categories above - gaining retrospective accounts. Scientific reports used as prompts to stimulate recall.</li></ul>
Four: October and November 2007	<ul style="list-style-type: none"><li>• Looking back on their experiences 12 months on and looking forward to their future transitions as graduates.</li></ul>

**The main categories included within the interview guides**

As indicated above, interview guides were constructed to include a range of topics where the theoretical and emerging thematic dimensions of the data guided the construction of the interview questions. Whilst the research questions are written in a more theoretical language, the actual interview questions were expressed in an everyday language that was easily understandable to the students (Kvale and Brinkmann, 2009). In addition, during the construction of the interview questions, further views were sought from my supervisors and comments were acted upon where necessary in order to further refine the questioning.

Each interview guide was constructed with the theoretical literature in mind, as well as the questions being data driven, using data collected earlier by multiple methods to inform my questioning. Hence, as noted in Section 4.1 I was able to respond and adjust my questions to the emerging themes I was beginning to detect within the data. For example, an emerging theme during the second phase of interviews was

that transitions were made possible for some students by interacting with others including peers and staff. So further questions were developed around this theme and used subsequently in the following interview phases and also, the video-session interviews. The interview guides were also adjusted to respond to the idiosyncrasies of the students' experiences. In particular, the examination of the letter to a friend and the analysis of responses in previous interviews aided this process. How the interviews were conducted in light of the pilot study is now presented.

### **Conducting the interviews**

As indicated previously, the study endeavoured to cause minimal impact upon the students' studies. A way to address this was by conducting the interviews at the campus where the students were studying and by fitting around their day-to-day commitments, such as lectures and classes. In addition I tried to offer the students a familiar territory where they could easily locate the interview room so the majority of the interviews were conducted in the same room in the Biological Sciences building. This was not always straightforward to arrange because there were times, for instance during exam periods when rooms on the campus were in high demand. Alternatively, I booked rooms near to where students were studying within recognisable, landmark buildings on the campus with the view that these would be easy to find. Additionally, in order that the students could organise their time around the interviews they were told that the interviews would take a maximum of an hour and a half to complete. Whilst most interviews lasted for just over an hour, this extra time provided the flexibility for briefings at the start of the interviews and time to take a break if necessary and on those occasions when students wanted to talk at greater length in response to my questioning.

Upon the completion of the pilot study I took into consideration that the students might have reservations about the interview process. For example, Kvale and Brinkmann (2009) have pointed out that interviewees may be apprehensive about talking freely about their personal experiences to a stranger. In an attempt to address this matter, at the start of the data collection I introduced myself in an initial email circulated to the students and I also spoke to students face-to-face prior to the interviews at a time that was convenient to them. As outlined above, my presence within laboratory classes and lectures made this easier to undertake. In addition, at the start of each interview I spent time talking to the students and this included a 'briefing' (ibid.: 128) where students were offered the opportunity to ask about the research and myself. This lasted rather longer during the first interview phase, although I did continue with this approach throughout. During the briefings I also talked specifically about the conduct of the interview. This included letting the students know that they could take a break when necessary.

Before each interview started I provided a sheet giving a brief outline of the main questions I would be asking, to examine if they wished. The uptake of this offer was mixed. Two students who spoke English as a second language appeared to appreciate the opportunity to examine the questions before each interview, while the other students occasionally viewed them, or some declined the offer all together. Also prior to conducting the interview I asked the students to tell me if they chose not to answer a question, or if there was one that they did not fully understand. In fact all the students did answer all the questions and on three occasions I was asked to clarify the wording of different questions.

Another important aspect of the briefings involved talking to the students about the audio recording their interviews. This method was used as a way of strengthening the reliability of the data: 'we cannot rely on our notes or recollections of conversations' (Silverman, 2005:161) Therefore, the use of audio recordings was viewed as being beneficial, because they are a record of the talk and they can also be replayed, resulting in higher quality, more detailed transcripts (Silverman, 2001). Permission was requested face-to-face and additionally, it was noted within the consent forms, which required their signature. All the students gave their consent to be recorded, although one requested that I kept the recording equipment out of view. However, as the study progressed the student became less conscious of the equipment and by the third interview phase, did not mind if it was in view. All the interviews and also the video sessions were audio recorded with a digital recorder and a tape recorder. This helped to provide a 'belt and braces' approach in case one failed to record. This was useful because it happened on two occasions. Overall I found that the digital recorder was the most reliable, producing clearer recordings that could be easily downloaded onto a computer.

Another way that I tried to put students at their ease was by the use of introductory or 'ice breaker' questions at the start each interview. Usually I would use a very general question such as, 'How is everything going?' before moving to more particular questioning. At the end of each interview, as a way of making sure that I had covered everything, I asked the students if there was 'anything that I had not asked that they would like to tell me?' As I became more experienced during the interview phases I became more confident and incorporated more interpretive questions (Kvale and Brinkmann, 2009). This involved for example, re-phrasing, or clarifying what the

student had said and this helped me to confirm that I had grasped the student's perspective. Further, I noticed that as the interview phases progressed and students became more familiarised with the process they appeared more at ease to share personal information about their experiences.

Finally, out of courtesy I provided the students with a sealed bottle of water at each interview. This was because I was aware that they would be talking at length over a period of time and often they had come straight from a lecture or class. The video-session interviews were also carried out in a similar manner to the individual interviews.

### **Video-session interviews**

The video-session interviews involved showing a number of selected video clips to the five students who had earlier been filmed during week 6 and 7 of the module while they were conducting their experiments within the laboratory. It was planned that the students would be involved in interview sessions which involved talking about their experiences within their original groups. As noted by Watts and Ebbutt (1987) group interviews are useful when the group has been working together for some time on a project and as a result everyone involved is aware of what other group members are saying. The students had previously been interviewed individually about their experiences and it was viewed that by undertaking group interviews, interactions would be prompted and further insights into the cases might be illuminated (Cohen *et al.*, 2000). In addition it aided the triangulation of the data. However, the group interviews proved very difficult to organise. The students were studying different degree courses such as, Biology, Human Genetics, and Genetics,

and so it was difficult to arrange a time and date that was mutually convenient for all the students.

It was intended that the interviews would be conducted at the end of the second semester in May 2007 in the third data collection phase. However, although the students stated that they would be available for the interviews when I tried to arrange them, three students informed me that they would be returning home earlier than specified because of planned holiday work and internships. So regrettably, the interviews were postponed until the start of their third year in October 2007 as part of the fourth phase data collection.

### **Conducting the video-sessions**

A group interview was conducted with three students who had worked with crickets (*Group 2*) and another was arranged for the two students who had worked with the flies (*Group 1*). One student in *Group 1* failed to appear, despite being sent a reminder via email and text. Unfortunately the interviews had proved to be problematic to arrange and as only one student had turned up, I decided to conduct interviews with these two students separately. As a result I talked to the *Group 1* students individually about the clips, and so I didn't capture the interaction and discussion provided by *Group 2* who viewed and talked about the clips together.

The video-session interviews had a semi-structured design, as discussed earlier. In addition, the students were briefed before the interview began about how the session would be conducted. The interviews lasted approximately one and a half hours in order to allow time to play the video clips which were shown one at a time and

paused whilst they were commented upon. The clips overall lasted 18-20 minutes. As noted previously, the aim of showing the clips was to stimulate the students' recollection of their laboratory work so after a clip had been played I asked questions about it, allowing the students to talk at length. I also asked the students to talk about anything within the clips, or their laboratory work that I had not questioned them about but they thought was important to add. During the interview with *Group 2*, I tried to make sure that all the students were given equal opportunity to talk and that individuals did not dominate the discussion (Bryman, 2004). During the play of the video clips to the students, I was aware of their reflexivity (Pink, 2001). This was particularly noticeable in the initial stages of the *Group 2* interview in which the students spent time discussing what they looked like and were obviously aware of their appearance on the video and were possibly self-conscious, especially within the presence of others. However as the video-session progressed, they seemed to become more familiarised with the images and the students' attention appeared to turn more specifically to aspects of their experimental work and the questions I asked them.

As indicated in the previous sub-section, the video-sessions were audio-recorded. Although all the students had previously given their permission at the start of the study both orally and in writing, I also asked them to confirm that these sessions could be recorded. Upon completion of the interviews, they were then transcribed as soon as possible. How the data was analysed is now discussed.

### **Transcription and data analysis**

As noted above, the audio-recordings using a digital recorder were heavily relied upon because these recordings had a good acoustic quality and were complete,



without for example, having to take time breaks to turn tapes over. In addition, by transferring recordings onto a computer using 'iTunes' software the transcription was easier because it could be very easily forwarded and rewound. Use was made of the time counter and this allowed the easy identification of specific comments within the different recordings. The times and dates of each interview were also automatically stored within a 'voice memo' file, aiding the data storage system<sup>15</sup>. The interviews were transcribed verbatim, although irrelevant data such as interruptions caused by requests for breaks during the interview were omitted. The interview questions within the guide were used as a starting point for the transcription, providing a template for the student's response. In addition, I asked participants if they wanted copies of their interview transcripts so that they might check that I had accurately recorded their responses. Only one student and the Course Convenor requested transcripts. These were emailed as soon as they were completed and I informed them that further comments or questions could be forwarded if they wished, although none were offered in response.

The issue of data protection was also considered during the transcription process. The data was made anonymous by using the students' pseudonyms and was stored on a computer with a security password. Audiotapes were also labelled using the student's pseudonym and stored in a locked draw in a secure office area. The transcripts were then analysed as detailed overleaf.

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<sup>15</sup> Data was stored in a secure area following BERA guidelines. For example, data upon the computer was password protected.

## **Analysing the data**

Analysis began at an early stage where as noted previously, contextual data in the form of documentation and text and observation were used to feed into the different students' interview guides. The interview data analysis began during the transcription process. A key benefit of transcribing the interview data was that I gained a close feel for the data before analysing the data formally. As advised by a number of research methods' authors (see Bryman, 2004; Silverman, 2005) qualitative data analysis should begin as soon as possible, otherwise the researcher might become overwhelmed by huge volumes of data.

In Table 4.2 (p.97) I showed the main categories I developed, upon which the four interview phases were based. For example, during the first phase of interviews I was able to determine from the students' accounts the different potential transitions the students could be faced with during their study of the module ADDE and in turn, these formed the basis for further interviews. These main overarching categories were subsequently connected to the theoretical framework and labelled as 'academic play' (Creme, 2008:49) spaces. How these spaces are relevant to Winnicott's (1971,1989) notion of play is detailed in Chapter 6. Then, during the transcription process and also, the repeated reading that followed, I began 'within' case analysis (Miles and Huberman, 1994; Merriam, 1998) to understand the different cases' transitional experiences in these different categories, or academic play spaces. I started this by highlighting the data in colours corresponding to the main theoretical themes and also flagging up any new themes and codes, adding further notes within margins where necessary. The coding therefore, was thematic (Flick, 1998; Braun and Clarke, 2006) and linked to the key categories explored in the interview and

research questions. However, I was also aware of new emergent themes and created new codes and sub-codes where needed. Thus the analysis moved between the emergent data and the theoretical literature (Merriam, 1998).

The main thematic codes used to analyse the students’ experiences of transition, are shown in Table 4.3 below.

**Table 4.3**

<b>Students’ experiences of transition: Main thematic codes</b>
Academic play within transitional space; categories: experimental play; communicative play; analytical play; writing play
True and false self / ‘me’ and ‘not me’
Creativity and compliance
Holding environment Facilitative / faulty
Emotions – negative and positive
Separation and integration
Transitional objects and phenomena

**The main thematic codes**

The codes within the transcripts were then numbered in order that quotes and codes could be located within the original transcripts and this was continued and revised throughout the data analysis process. This system is used within the thesis, where data extracts have been tagged with: the case transcript number corresponding to the interview phase (T1, T2, T3, or T4), video session interview (V1, V2 or V3), or letters (L1, L2, L3, or L4); the code number indicates its location within the

transcript; and also, the year in which the interview was conducted. This aided the creation of a data management system where data sources could be easily sourced and retrieved. In addition, it was viewed that it might help the reader to gain a sense of when the data was collected, an important aspect of the case study design, bounded by time and place.

As transcripts were completed and data colour-coded according to different themes, I printed off hard copies that I could re-read and code further, adding notes when needed. Through this process I gained a closer feel for the data and a deeper understanding of the student cases. I also used the computer programme NVivo to assist the analysis of the data to ensure that I had effectively identified the codes within the data. For example, by using the 'text searches' (Gibbs, 2002:42) function, I could identify specific words or themes within the transcripts. Therefore, after initial codes had been established, it provided a quick and efficient way to identify codes.

As the different interview phases were completed, I then turned to analyse further the within cases experiences through the use of chronological comparison where I analysed the data collected during different interview phases to make comparisons within the case over time. Data collected using other methods were drawn upon for the purposes of triangulation. I also achieved a greater understanding of the data through visual representation in which I constructed tables where row-by-row and column-by-column comparisons could be made. So, whilst I found NVivo to be beneficial because it aided swift analysis, I also made detailed matrices, working closely with the transcripts. Here, I drew on the ideas of Miles and Huberman (1994)

who provide detailed accounts about constructing matrix displays. Within the different cell entries I included direct quotes extracted from transcripts to maintain the integrity of the data (Merriam, 1998) and also from my own notes including for example, connections to theoretical themes and codes, descriptions, summaries and links to other data (See Miles and Huberman, *op.cit.*: 239-244 for general rules on matrix displays). Again I sensed a better feel for, and an increased understanding of the data through constructing and elaborating upon the matrices myself, rather than relying solely upon the on-screen NVivo application. As noted by Gibbs (2002) NVivo, 'is just a tool for analysis, and a good qualitative analysis still relies on good analytical work by a careful human researcher' (p.13). Overall, I constructed 5-7 matrices for each student.

I then conducted *between* case comparisons (Miles and Huberman, 1994) in which I could compare and contrast the cases different transitional experiences by drawing upon the within case analysis. This began through the use of NVivo and the students' chronological matrices where initial case-by-case comparisons were made. Further manipulation then took place in which larger and more detailed matrices were constructed. An example of the type of matrices created is shown in Table 5.1 (p.122) where the students' different biographic information is tabulated. I constructed eight between case matrices in total, corresponding to the overarching academic play space categories outlined in Table 4.3 (p.106).

As a result of conducting these two forms of analysis that is, within and between cases, I was enabled to undertake 'categorical aggregation' (Stake, 1995: 75) where I sought a collection of instances from the data and looked for emergent, relevant

issues. The data was analysed for specific themes resulting in the aggregation of information into large clusters of ideas, which could then be triangulated and provide details to support the themes. Stake (*ibid.*) has called this stage of analysis the ‘development of issues’ and it has been described by Gibbs (2002:10) as ‘the heart of analysis’ in which an understanding and meaning of the text is achieved. Using this method I was able to identify possible patterns, areas of convergence and contradiction and so forth, in a structured and systematic way. As a result of this rigorous analysis, I was able to gain an in-depth understanding of the students’ transitional journeys, as reported within the empirical chapters.

In conclusion this chapter has aimed to provide a rationale for the use of a qualitative case study and the associated multiple methods. Within the rationale, it has been argued that this approach is congruent to the aims of the study and the associated research questions. Chapter 5 now moves to introduce the eight second-year students who took part in the study.

## **Chapter 5**

### **An introduction to the students**

In this Chapter I introduce the eight students taking part in this research study. I provide general information about each student, including biographical data that incorporates some details about the students' prior, first-year transitional experiences at university. This information is presented here so that a fuller picture of the student cases can be gained, bringing the reader up to the starting point of the empirical chapters that is, the beginning of their second-year study.

#### **5.1 The student cases**

Information about the students is outlined below. The students are presented in alphabetical order according to their first names.<sup>16</sup>

##### **Alan**

Alan lived out of term-time with his adoptive parents who are his Aunt and Uncle. His natural parents didn't attend university and neither did his adoptive parents, although all of his three cousins have. His adoptive parents encouraged Alan to study at university. Alan attended a local comprehensive school where he studied four A-levels in the sixth form, including Biology (A), Chemistry (B), Art and Design (A) and Geography (B). While studying at AS level, Alan considered taking Fine Art at university because not only was he passionate about the subject he also excelled, achieving 100% for each of his pieces of assessed coursework and was named as one of the top five pupils within England. However, he made the difficult decision not to

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<sup>16</sup> As discussed in Chapter 4, pseudonyms have been used throughout the thesis.

study Art further because of the requirement to study a Foundation Course at a Further Education College, before entering university. As a result, he decided that studying Art should remain a dream because by staying at home a further year he thought that he might become a financial burden. So he contemplated studying other subjects at university, including Geography, Architecture and Philosophy, but finally decided to opt for the Natural Sciences because not only did he love the subject, he also felt that learning the subject matter came naturally to him. So he applied to three universities, with his final option being Hill Mount University to study Biology as a single Honours degree. Unfortunately, he did not gain the grades required for each of his first two options to study a joint honours degree in Biology and Chemistry. In particular, Alan spoke of his devastation when he was not offered a place at his first choice of university, commenting on being 'knocked back' and feeling like a 'reject'.

Alan stated that his transition to Hill Mount University was experienced as smooth because he felt ready for the move. He said that it was a 'natural progression'. Once in university, he sensed that he was prepared to work more independently because he was already aware of his 'inner drive' to learn as opposed to being told to do so, by for example, his parents. Yet, Alan also indicated a dislike for the impersonal nature of teaching based on lectures that seems to have dominated the first-year course. He emphasised that he missed the interaction he had experienced during his A-level study. Further, he felt it more difficult to seek help from staff at university.

Alan lived during term-time in rented accommodation off the university campus. He was involved in a lot of theatre work and participated in a couple of performances and spoke of taking part in the Edinburgh fringe festival. However, at the start of the



second-year he stated that he needed to get his priorities straight and therefore chose to reduce the time he spent doing drama. During the study Alan often referred to his 'overdraft of doom' and expressed his constant worries about managing his personal finances despite receiving the support of a bursary from his Local Education Authority (LEA).

### **Angela**

Angela commented upon her pride at being the first member of her immediate family to attend university. Her parents are farmers and have encouraged and supported her wish to attend university which she aspired to and felt was something that she always knew she would do. She attended a local comprehensive school where she studied Biology (A), Drama (AS level A), Geography (B) and English Literature (A). Her interest and love of science was gained by a combination of studying Biology and also the home influences of farm life. This led her to apply to Hill Mount University as her first choice to study Genetics because of its high reputation. When considering her choices Angela was made aware that she would require a chemistry qualification. Therefore, she dropped Drama at AS level and took AS level Chemistry (A) which ran alongside her second, final year of A-level study. Unfortunately the school was unable to timetable Chemistry classes for her, so she studied the course independently at home, supported by her father. She commented that this was a difficult time as she often studied Chemistry in the evening when she was tired, plus she found it to be a difficult subject. Therefore she found studying it to be a struggle. However during her university study she appreciated the effort she had previously made because it enabled her to understand the course material better.

Before starting university, Angela took a gap year where she worked in a cell-culture laboratory. She was able to acquire this placement through the 'Year in Industry Scheme'<sup>17</sup>, which organises placements for science students in the biotechnology / engineering industries. She felt this was a personally valuable experience because it helped to prepare her for university.

Angela stated that her transition into university was smooth. As with Alan, she commented that she felt it to be a 'natural progression'. However, Angela found the impersonal nature of the lecture based teaching methods to be difficult, noting that she missed the friendly, small classes that she had experienced during her Sixth Form study. In addition, because Angela had gained laboratory experience during her gap year, she found the first-year laboratory classes to be simple and at times, mundane.

Angela has a busy social life. She acts as a Social Secretary for the residential hall she stayed in during her first-year and is also, a Treasurer for a Music Society. In addition, she works between 10 and 15 hours per week at a café on the university campus. Angela is also in receipt of a financial award from her Local Education Authority (LEA). She lives in rented accommodation with her friends off university campus.

## **Ben**

Ben and his older sister are the first members in his immediate family to attend university and this was encouraged by the support of their parents. Ben was educated at a private, single sex Grammar School. His interest in science grew when

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<sup>17</sup> The Year in Industry Scheme (YINI) is a UK student placement provider which provides paid placements to students in their gap year and during their degree course. See <http://www.yini.org.uk>

he was at school and this prompted him to study three separate sciences at GCSE level and also, to study science further at A-level in which he studied Biology (B), Chemistry (A) and Physics (B). He chose not to do a gap year and was successful in gaining a place at Medical School. Ben settled in well to university life and in particular, he enjoyed the social life and made a lot of friends. But after studying the course for one year he decided that deep down, it was not what he wanted to study. The main reason for this was that the course was long, lasting a minimum of five years, or seven if he decided to be a doctor. He also developed a dislike for the course material. He considered applying to Business School, but because of his love of animal physiology, he decided that after studying a course he didn't enjoy he thought it best to study a course he thought he would, so applied to study for a degree in Biology.

Ben's transition into Hill Mount University was eased because he had already studied Medicine as a first-year student. Therefore, he thought it was a smooth transition for which he felt well prepared. Yet, Ben commented that although he particularly liked laboratory classes he found university level classes difficult at times. Students worked in pairs when conducting their laboratory work in the first-year and Ben said it was particularly hard when his partner was absent, finding it difficult to cope on his own.

Ben enjoys playing sport and going to the gym. He regularly plays hockey and football at university. He also occasionally works for his father who runs a family business, although this is mostly during weekends and holidays when he has the time to return home. He lives in rented accommodation off the university campus with six

of his friends.

## **Kate**

Kate and her brother are the first members of her immediate family to attend university and Kate commented that her parents pushed her hard to apply to university. Kate attended a Grammar School through to the age of eighteen. During her GCSE study she was on the National Health Service (NHS) waiting list for a spinal fusion. Not knowing when the operation would be scheduled was a very stressful time for Kate and it affected her study. She finally had the spinal fusion after she had completed her GCSEs. But when she returned to school in a back-brace Kate soon found that she could not cope with the workload associated with four AS level qualifications, so she decided to continue studying, Biology (B), Religious Studies (B) English Literature (C) and drop German. Biology soon became Kate's favourite subject and although her AS level grades were affected drastically by her recovery, overall her grades at A2 showed a huge improvement. However, she did not manage to obtain the grades she required to fulfill her ambition to study a Foundation Course in Medicine. But because she was particularly interested in medical genetics she accepted a place on the Human Genetics degree course at Hill Mount University through the clearing process.

Kate thought that Grammar School had prepared her well for studying at university but found her transition difficult because she struggled with the Chemistry content in the first-year modules. However, she indicated that she was developing an 'inner' will to push herself forward, in which she stated that she had worked hard and gradually improved her understanding, eventually gaining top marks. Kate also felt that the lecture classes were large and impersonal and she found it hard to maintain

her concentration during them.

During term-time Kate lives off campus in rented accommodation with her friends. Her wider commitments involve writing about childhood conditions for a children's charity website. She is also president of the university's Genetic Society.

## **Matthew**

Both of Matthew's parents attended university. His mother was a language teacher and his father taught biology. Both parents have encouraged and supported Matthew's education. Because Mathew's parents are now both retired, he was able to qualify for a bursary provided by his LEA. Matthew's two older brothers also attended university.

Matthew has home student status. Previously he attended a private boarding school in Kenya, a country that he frequently spoke passionately about, before returning to the UK to study A-levels at a local comprehensive school. Matthew studied four A2-level subjects including Biology (A), Chemistry (B), Philosophy (A) and Geography (A) plus, English Language (A) at AS level. Previously he had studied for the International General Certificate in Secondary Education (IGCSEs) in Kenya, taking Physics, Chemistry and Biology as separate sciences. He chose not to take a gap year because he did not want to disrupt his study and felt happier maintaining his discipline of studying with the A-level course material fresh in his mind.

Matthew stated that his transition into Hill Mount University was smooth where he particularly enjoyed the varied course content and laboratory classes. However, he said that he missed the 'personal touch' of the teaching provided during his A-level study where the classes were small and it was easy to ask questions. Therefore the

move to the more formal nature of lecture classes was difficult for Matthew. Specifically, he noted that he found it problematic to keep up with the fast pace of the teaching and often had so many questions that he did not know how to begin to address them.

At university Matthew has a busy social life for example, he plays football regularly, attends church and is a member of the Christian Union for which he does a lot of charity work such as soup runs for the homeless. He described himself as a hard worker and spoke of his love for Christianity and how he enjoyed helping people in need. During term-time he lives off campus with friends in rented accommodation.

### **Nicky**

Both of Nicky's parents have attended university. Her father is in the Royal Air Force and as a result she has moved eleven times in twenty years, consequently changing schools and curriculum extensively. She studied in Scotland for eight Scottish Certificates in Education (SCE) at standard grade, but because she was studying two languages she was only able to study one science subject, Biology. She felt this put her at a disadvantage because when she moved to England and started her A-level study at a Grammar School she was unable to study Biology because she had not studied Chemistry. So she studied two subjects at A2 level, History (B) and Physical Education (B) and also French (C) and German (C) at AS level. She decided to take gap year and applied to study A2 level Biology (C) at college because she thought she would like to study Physiotherapy at university. During this year she was busy working as a care assistant; occupational therapy technician; nursery nurse; and a piano teacher. But she was disappointed when the college

Biology course for which she had enrolled failed to attract enough applicants to be viable. So instead of attending lessons she spent the time studying the course material on her own. Unfortunately, she missed gaining a place to study Physiotherapy at university by one grade so she attended an open day for students wanting to enter university through the clearing process. After talking to staff she decided to study a degree in Biology at Hill Mount University although she was very apprehensive about this and worried that she might struggle.

Indeed, Nicky's transition into Hill Mount University was difficult. She said that she particularly struggled with the Chemistry and Maths content of the first-year modules and needed the help of additional study support. As a result of seeking extra help, pushing herself to work hard, and the support of her parents Nicky managed to gain just enough marks at the end of the first-year to pass and qualify to continue with her studies. She also seems to have benefited from a growing interest in the subject of Biology, and by her enjoyment for laboratory classes that helped to further her understanding of the theory taught in lectures. At the start of the second-year Nicky thought that she had gained greater self-confidence and was more open-minded about her academic work.

Nicky lives with friends in rented accommodation off the university campus during term-time. Her spare time is devoted to athletics and rowing.

## **Ryan**

Ryan's father attended university and is a business consultant. Ryan originally comes from Japan and his first language is Japanese although he also speaks English and French. He moved to Switzerland when he was eight and went on to study for the

International Baccalaureate (IB) Diploma<sup>18</sup> in Geneva where he studied Biology (level 6) Chemistry (level 5) and Geography (level 5) at Higher level and English, Maths and French at standard level. He felt that the experience of studying for the IB was important in preparing him for university not only through gaining knowledge in Biology and Chemistry, but as a result of the personal development he achieved through extra curricular activities including caring for others by undertaking voluntary work, and working with others through team sports. However, he also found studying the IB to be hard at times and was very disturbed when friends dropped out of the course. He became so upset that was advised by teaching staff to see a psychologist who helped him to talk through his problems.

Ryan originally aspired to become a veterinary surgeon. However, during a work placement he decided that although he loved and wanted to help animals he could not face up to being in situations where he would have to put them to sleep as he found it too upsetting. Because of his interest and passion for animals and science, he decided to study Zoology at Hill Mount University, seizing the opportunity to study in the UK.

Ryan felt that his transition into university was smooth where he thought that his study of the IB had prepared him well. However, he did say that studying independently and the lecture methods of teaching were initially a 'shock'. But, he soon settled into university life and said that overall, he was happy with the transition. His move to university might have been eased by his involvement in two committees where he began to feel part of the university.

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<sup>18</sup> The IB Diploma is graded from 1-7 for each of six subjects and a minimum of 24 points is needed to pass



Ryan viewed social activities as an essential part of his university experience and took part in Salsa and Latin ballroom and also, Japanese societies. Yet, he was often worried about maintaining the balance between studying and committee work and continued to express his concerns throughout my study. During term-time he lives in rented accommodation off campus in a house he shares with five of his friends.

## **Wendy**

Wendy is the first member of her immediate family to attend university and spoke proudly about her achievement. Her parents both encouraged Wendy to go to university. She is originally from Hong Kong and came to the UK with her mother when she was 15 years old and attended a comprehensive school. Her father remained in Hong Kong where he works as a policeman. Cantonese is her first language and she speaks English which she started to learn at the age of 6. She studied Computing (D), Biology (D) and Maths(C) and Chinese (B) at A2 level at College and had been very interested in studying Physiotherapy at university. Unfortunately she did not achieve the required grades, but was able to gain a place to study Human Genetics through the clearing process. She is very pleased that she has had the opportunity to study this course because she is particularly interested in cancer research and in the summer of 2005 she worked in a laboratory in Hong Kong where she conducted laboratory tests in relation to the connection between the human papilloma virus (HPV) and cervical cancer. Wendy often talked about her love and fascination for her Human Genetics course and how different cures for cancer were being developed. However, Wendy regarded gaining her place on the degree course through clearing to be a 'tragedy' and she does not disclose this to her peers or friends at university out of personal embarrassment.

Wendy thought that her transition into university was smooth. However, she struggled with the lecture methods, particularly the fast pace that lecturers talked. This led her to use an MP3 player to audio-record the lectures so that she could play them back at her own speed. Taking part in a busy social life where she made lots of new friends also eased her transition. Wendy said that she had ‘played hard’ socially consequently; she admitted that she was sometimes lazy when it came to her academic work. Yet, at the start of the second-year Wendy said that she was going to take her studies more seriously, driven by the fact that assessment marks now count towards the degree award.

Wendy lives in a hall of residence on the university campus choosing not to share rented accommodation with her friends.

To conclude my introduction to the students I provide further general information about the student cases in Table 5.1 overleaf.

Name of Student <sup>19</sup>	Alan	Angela	Ben	Kate	Matthew	Nicky	Ryan	Wendy
Age <sup>20</sup>	19	20	20	19	19	20	19	19
Status	Home	Home	Home	Home	Home	Home	International	Home
Qualifications upon entry into HE	A-levels: Art and Design A Biology A Chemistry B Geography	A-levels: English lit A Biology A Geography B Drama A (AS) Chemistry A (AS)	A-levels: Biology B Chemistry A Physics B	A-levels: Biology B Religious studies B English lit C	A-levels: Biology A Chemistry B Philosophy A Geography A English A (AS)	A-levels: Biology C History B Physical Education B French C (AS) German C (AS)	International Baccalaureate: Higher: Biology 6 Chemistry 5 Geography 5 Standard: English, French, Maths	A-levels: Chinese B Maths C Biology D Computing D
Science qualification at GCSE	Double Award	Double Award	Separate sciences	Double Award	Separate IGCSE <sup>21</sup> Sciences	Biology SCE <sup>22</sup>	-	Separate Sciences
Gap year	No	Yes	No	No	No	Yes	No	No
Family in HE <sup>23</sup>	Yes	No	Yes	Yes	Yes	Yes	Yes	No

<sup>19</sup> Pseudonyms have been used to ensure the anonymity of the students taking part in the study, as discussed in Chapter 4

<sup>20</sup> Age at the start of data collection - October 2006

<sup>21</sup> International General Certificate in Secondary Education

<sup>22</sup> Scottish Certificate in Education at standard grade

<sup>23</sup> Immediate family members previously or presently studying at university

Name of Student	Alan	Angela	Ben	Kate	Matthew	Nicky	Ryan	Wendy
Financial award <sup>24</sup>	Yes	Yes	No	No	Yes	No	No	No
Previous educational institutions	Comprehensive School	Comprehensive School	Private Grammar School	Grammar school	Private school and Comprehensive	Comprehensive and Grammar school	Private school	FE college
Degree programme	Biology	Human genetics	Biology	Human genetics	Biology	Biology	Zoology	Human genetics
Employment during term-time	No	Yes	No	No	No	No	No	No
Final Mark for ADDE <sup>25</sup>	61%	70%	57%	69%	69%	Pass-2(ii) range	Pass-2(ii) range	Pass-2(ii) range
Expected degree award	2(i)	First class	2(i)	First class	First class	2(i)	2(i) or 2(ii)	2(i)

**Table 5.1.** Table to show the students' biographic data

<sup>24</sup> Awarded by Local Education Authority (LEA)

<sup>25</sup> This is an average figure. The marks obtained were offered on a voluntary basis. Three students chose to provide the range their mark was in.

## **Discussion**

The students' biographical data show a diversity within the group in which there are similarities as well as differences. The main differences include their qualifications upon entry to Hill Mount University. To illustrate, at GCSE level Matthew had studied International GCSEs and Nicky had studied Scottish Certificates in Education at standard grade. In addition, Ryan had an International Baccalaureate (IB) qualification. There is also variation in the students' qualification grades upon entry to university. The students also exhibited differences in their prior cultural experiences. For example, Ryan had lived in Japan and studied in Switzerland and Matthew had lived in Kenya. In addition, Wendy had lived in Hong Kong prior to moving to the UK. For both Ryan and Wendy, English is their second language, although they consider themselves to be fluent speakers. Furthermore, studying a degree course at Hill Mount University was not necessarily the first choice of all the students. Nicky, Wendy and Wendy entered the university through the clearing process, Ben had previously studied Medicine before applying to study Biology, and Hill Mount was Alan's third choice.

There are also slight differences in the students' ages upon entry with Angela and Nicky taking a gap year to gain experience in employment, and Ben having already studied a first-year university course. Moreover, Wendy, Angela, Ben Alan and Kate reported that their parents were not university educated, although all students taking part in this study did indicate that their parents supported and encouraged them to attend. Finally, Alan, Angela and Matthew received extra funding from their LEA and Angela also worked part-time to help finance her studies.

With regard their similarities the students were all involved in social activities, including various societies and other interests alongside their degree study. During term-time in their second-year all the students apart from Wendy chose to live off campus in rented accommodation with friends.

The variation and similarities outlined above could, in turn, could have implications for their experiences of transition into and within university. For example, Archer and Hutchings (2000), Haggis and Pouget (2002), Furlong and Forsyth (2003), and Karousou (2010) have examined how age, ethnicity, social class, social networking, prior educational experiences and perceptions of university study might influence students' first-year transitions at university. While this study does not aim to focus upon these issues specifically they will be considered where required in Chapter 11 when I provide an overview of the students' transitional journeys. I complete my discussion by briefly examining the students' comments about their first-year transitions.

Six students, namely, Alan, Angela, Ben, Matthew, Ryan and Wendy reported that overall their transition from school or college into Hill Mount University was generally 'smooth'. The students' transitions overall, appear to have been facilitated by a sense of feeling prepared for university and becoming involved in university life and social activities outside their academic studies. That said, their transitions were not necessarily problem free. A key difficulty appears to have been the move from the more personal teaching at school or college where help was easily gained to the larger, more formal lecture methods. This concurs with the study undertaken by

Palmer *et al.* (2009) that found first-year students felt alienated by the sheer size and remoteness of lecture theatres and struggled when faced with greater anonymity.

Nicky and Kate who both entered university through the clearing process reported more difficult transitions, particularly with regard to the Maths and Chemistry content of the course. However, they responded to these difficulties by pushing themselves to work hard, and Nicky was helped by accessing study support, though despite this she commented that she had struggled to pass the first-year course. Many of the students chose not to reveal their marks for the end of their first-year of study. However, all stated that they had easily passed, although Matthew (71%), Angela (72%), Alan and Kate indicated that they had achieved high grades.

In conclusion, this chapter has provided details about the different students taking part in this study. I have provided biographical details and included some information about the students' prior transitions, bringing the reader up to the starting point for the empirical chapters.

In the following chapter I provide details about the module 'Analysing Data and Designing Experiments' and relate it to Winnicott's (1971, 1989) notion of play.

## **Chapter 6**

# **A potential transitional academic play space: Analysing Data and Designing Experiments**

### **6.1 Introduction**

The purpose of this chapter is to set the scene, theoretically and empirically. In Chapter 3 I highlighted that Creme and Hunt (2002) usefully show the relevance of Winnicott's (1971,1989) notion of play, to the workshops on creative writing they provided for students. Similarly I show that the concept of play can be applied to 'Analysing Data and Designing Experiments' (ADDE), the second-year module of the Biological Science Degree at Hill Mount University.

I begin by providing a description of the module ADDE. Then I show how the ideas of Winnicott (1971,1989) about play can be applied to ADDE. Finally I outline the proposed different academic play spaces within which ADDE invited students to engage.

Information provided within this chapter is derived from: The first interview with George, the Course Convenor<sup>1</sup>; course handouts; and, course information provided on-line. In Sections 6.3 and 6.4, I also draw upon empirical data gathered using the multiple methods as outlined in Chapter 4 'Research design', and in particular, the interview data gathered during the first two phases of the data collection.

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<sup>1</sup> As stated in Chapter 4 'Research design' pseudonyms have been used throughout this thesis.



## **6.2 A description of the module ADDE**

ADDE is delivered at the start of the students' second-year of study and is compulsory for all students studying the Biological Science programmes, comprising Biology, Genetics, Human Genetics and Zoology. Approximately one hundred and fifty students were studying this module and during the laboratory classes, students were divided into three groups with approximately fifty students working in separate laboratories. At the time of this study's data collection (2006-2007) the module was in its second year of presentation. Previously the course had been delivered as two separate courses, one of which had concentrated upon statistical analysis, involving both lectures and computer-based classes. The other module was a laboratory-based course which focused upon animal behaviour. Therefore ADDE originated from a fusion of these two courses. It is unique, because it is the only module delivered during the Biological Science degree programme to include both lectures and laboratory work. These are normally delivered as separate modules. ADDE includes both in order to aid students to incorporate the analysis of their data into their experimental design (see Chapter 9 for a fuller discussion).

Table 6.1 overleaf shows the module timetable, outlining the weekly teaching content and location of the classes. The key aim of the module is to teach students about: creating and conducting an experimental design; recording and analysing quantitative data; presenting scientific work orally; and, scientific report writing.

**Table 6.1**

<b>Week</b>	<b>Teaching Content</b>	<b>Teaching Location</b>
1	Introduction to experimental systems	Laboratory
2	Preliminary results – presentation and discussion	Laboratory
3	Probability and statistical inference: Introduction to non-parametric statistics	Lecture theatre
4	Parametric statistics (1) - Tests for differences	Lecture theatre
5	Parametric statistics (2) -Tests for trends	Lecture theatre
6	Mini projects - week 1	Laboratory
7	Mini projects - week 2	Laboratory
8	Project presentations	Lecture theatre
9	How to write up the mini projects	Lecture theatre

**The structure and delivery of the module ‘Analysing Data and Designing Experiments’**

I now discuss how Winnicott’s notion of play is relevant to ADDE.

**6.3 Winnicott’s notion of play applied to ADDE**

Winnicott’s notion of play is particularly well documented within his final book ‘Playing and Reality’ (1971) and also in his ‘Notes on Play’ (Winnicott, 1989). Below I draw upon his ideas about play to indicate how they correspond to the module ADDE.

**1. Playing is doing** (Winnicott, 1971:55). By playing ‘one has to do things, not simply to think or wish’ (ibid.: 55) This conjures up the idea that in order to play, students need to take part in various activities and the module ADDE provided many opportunities to ‘do things’ which are listed in Table 6.1. For example, within the laboratory the students created their own experiments and this was ‘playful’ in that they experimented with their different ideas and various experimental equipment, before conducting their

final design as part of their 'mini-projects'. Through play which is located in intermediate transitional space, the students had the potential to forge connections between their 'inner' knowledge and the 'outer' world in which they were provided with experimental equipment, or the 'bits' (Phillips, 1988a: 86) they needed to find and use, to create their experimental design. I explain in the empirical chapters how further activities including, working with others, presenting orally, analysing quantitative data and scientific report writing, were also playful in various ways. Winnicott (1971) noted that 'doing things takes time' (p.55) as pointed out by Creme (2008), ' Meaningful and engaged learning is not the consequence of a pre-existing fit between what the learner brings and the object of study. It is rather forged [... by] an ability and a willingness to play seriously and sustainedly' (p.52-53). I report later how some students, particularly when analysing their quantitative data, needed to play persistently over time in order to forge connections.

**2. Play is an imaginative elaboration [...] relating to objects and anxiety.** (Winnicott, 1989:60). As I indicate above, the students needed to put themselves into relation with various objects and also phenomena to create their experiments. I will show that during their study they also had to put themselves himself/herself into relation with the new and different 'outer' that could cause anxiety, illustrating that 'play is serious as well as enjoyable' (Winnicott, 1950c: 22).

**3. Play is primarily a creative activity [...] under conditions in which the child is confident in someone, or has become confident generally through adequate experience of good care** (Winnicott, 1989:60). This emphasises the potential nature of transitional space. In terms of the module ADDE the potential of transitional academic play was only realised if the student had enough self-confidence in the teaching and learning holding environmental provision, sensing it was 'good enough' (Winnicott.1971:187) .

**4. Playing involves control over a limited area** (Winnicott, 1989:60). The experimental work of the students, involved creating their own experimental design, in contrast to previously when they had been given an experimental protocol and complied with instructions. Thus the students were able to gain a greater sense of empowerment and control over their experimental work. This points to the idea that playing also involves freedom (Creme and Hunt, 2002) in which the students move from a dependence upon staff towards greater independence in their experimental work, where there are no correct or 'right' experiments. Now they have the freedom to decide: the direction of their experiment; how their data will be analysed; the ways in which they talk about their experiment to peers, either in groups or in oral presentations; and finally, how to bring their ideas together and make connections between them to create a scientific report, that has a sense of self as a result of creative play. Thus, the play space provided by ADDE appears to be congruent in some ways to the creative writing workshops conducted by both Creme and Hunt (*ibid.*) which were proposed to provide play spaces

which involved ‘contained chaos’ (Milner,1971): ‘contained’ because there is a member of staff who is facilitating the direction of the class, but at the same time, ‘chaotic’ because the staff member urges the students to live more dangerously by taking risks, re-thinking the rules and making mistakes. However, this stage is temporary and the final written piece of work will not be as chaotic, although it is anticipated that ‘such rich imaginative playing may well provide material and connections that will contribute to and feed the final product’ (*op.cit.*:161).

**5. Playing involves playing games with rules and regulations pre-arranged** (Winnicott, 1989:61). As noted above, ADDE provided students with the potential to play and take risks by re-thinking rules. Yet students also put him / herself into relation to playing games with prearranged rules for example, in terms of analysing their quantitative data they played ‘epistemic games’ (Perkins 1997, 2006) which ‘inform inquiry within and across the disciplines’ (*ibid.*,1997: 49). In Chapter 9 I report how the students played and also perceived these games as ‘underlying’ (*ibid.*, 2006:29).

**6. Developments in the capacity for playing (socialization). From playing comes:**

**(a) Playing along with others with gains in the exercise of** (Winnicott, 1989:61). The module ADDE involved students working together on creative group projects. In Chapter 8 for example, I show the ways in which students put him / herself into relation with the ideas of their peers and how they helped each other overcome difficulties and

problems. This also aided the development of the capacity for playing in terms of developing a voice and a capacity for concern for others.

**(b) Allowing for complexities in terms of leader and led. / Playing according to rules:**

***[individual's] own, rules, shared regulations*** (Winnicott, 1989:61). By working together the students studying ADDE were able to play according to rules, for example in Chapter 8, I demonstrate how the students determined their own rules according to the creation of their experiments and how they were to be conducted. In addition, I show how some students worked together according to shared regulations whereas others preferred to be led, or be 'held' strongly by a group member.

**7. Playing involves taking on new identities and roles** (Creme and Hunt, 2002: 60).

Overall the module ADDE gave students the potential to be and become creative Biological Scientists and this involved taking on new un-thought of roles, such as becoming a leader of a group and new identities in terms of shifting who they wanted to become. Some students were able to surprise themselves by 'acting or not acting in a way that fitted the situation' (Winnicott, 1950a: 16). Additionally I show how the students developed into individuals with a voice and gained the confidence to play with different 'voices' in terms of their group work, oral presentations and scientific report writing.

**8. (a) A characteristic of play is pleasure** (Winnicott, 1989:59) Within this thesis I show that during the study of ADDE students showed different senses of ‘aliveness’ (Winnicott, 1971:76) which connects well to Rowland’s (2005) ideas about individuals having an ‘intellectual love’ (p.92) for a subject.

**(b) Playing is essentially satisfying** (Winnicott, 1971:70). Some students also exhibited a feeling of ‘integration’ (Winnicott, 1958b: 5) during their learning and showed a sense of satisfaction as a result.

In this thesis I argue that the module ADDE provided the students with an invitation to take part in academic play and in each of the following empirical chapters, I report the students’ different experiences including, how they reacted, coped and developed personally and the ways they were facilitated or hindered from increasing their capacity to play creatively in transitional space. In Chapter 3 I noted that Winnicott proposed that when individuals encounter an outside ‘not me’ they might put ‘inner’ self into relation with ‘outer’ in intermediate, transitional space. In terms of Higher Education, this could be referred to as transitional ‘academic play’ (Creme, 2008:49) space that invites the interior self to be put in motion to encounter the outer ‘not me’ teaching and learning environment. It is here, in transitional space that Winnicott (1971) proposed individuals play creatively and in so doing forge connections with the outer familiar, unfamiliar and un-thought. I outline overleaf the different ways in which the module ADDE invited the students to take part in potential transitional academic play.

## **6.4 ADDE's academic play spaces**

In this section I provide an overview of the different ways the module ADDE invited students to play creatively within transitional space. The students' experiences of transitional academic play will be explored further within the empirical chapters. Overall throughout the thesis, I argue that the module invited the students to move away from being compliant and dependent upon the instruction of staff to become more independent, creative Biological Science students.

### **1. Inquiry style laboratory instruction / open-ended projects**

Here the students were given what the Course Convenor, George, referred to as a 'cold start'. In the first two weeks of the module, students were provided with equipment and experimental animals within the laboratory which they were required to use to create their own experimental design to be conducted during weeks 6 and 7 of the module as a group 'mini-project'. In Chapter 7, I argue that the students were invited to put him / herself into relation with a radically different other because previously, prior to their university study and also during their first year at university, the students had been provided with experiments and instructions and were told how to conduct them. In this experimentation the students know what the outcome will be. In contrast, the students' study of ADDE involved creating experiments that were open-ended and the outcome was uncertain. It was also the first time that the students had conducted experiments with live animals.

### **2. Working with others**

Students were required to work in groups of approximately four. Before their university study and during the first year of the degree course the students had only worked



individually or in pairs within the laboratory. The students therefore were invited to put themselves in relation to the thoughts and ideas of others. In Chapter 8, I draw upon the writing by Winnicott (1963b, 1971) on communication, as discussed in Chapter 3 and also the contemporary work of Denise Bachelor's (2006,2008). By using the notion of student 'voice' I examine the ways in which the students take part in mutual communicative academic play. I also use their ideas to examine the students' experiences of oral presentations within the laboratory.

### **3. Oral presentations**

The students were required to give two oral presentations. Firstly, informally within the laboratory and secondly, more formally within a lecture theatre in which one student spoke on behalf of the group. With the exception of one student, all students reported that they had very little experience of oral presentations and had not presented at university. In the thesis I examine the students' experiences of the first oral presentations within the laboratory in terms of how they developed, or did not develop their voices. The second presentations were assessed and only two students spoke, representing their different groups. However, I do not detail these two students' experiences but in Chapter 9 and 10 I examine how the second presentations facilitated or hindered all the students' capacities to play during their data analysis and scientific report writing.

### **4. Quantitative data analysis**

The students were required to connect statistical tests to the data they had generated themselves during their experimentation, incorporating their data analysis into their experimental design. They were also expected to learn new and unfamiliar statistical

concepts<sup>2</sup>. In Chapter 9 I show that this involved transitions at a disciplinary boundary (Becher and Trowler, 2001) between the Biological Sciences and Mathematics where the data analysis and statistical concepts provided the students with a radically different ‘outer’ which is ‘not me’ (Winnicott, 1960c:17). Consequently all the students needed a strong degree of holding environmental provision (*ibid.*,1971) during this transition.

## **5. Scientific report writing**

The students were required to write independently a scientific report which was assessed. This required them to bring together and make connections between the experimental design, that they had created themselves, their data analysis, and also put their experiment into relation with the wider, scientific literature. In addition the report included references and an abstract, which had not been required during their first year of study. It also involved writing at length (3000 words). This transition represented a move away from compliance, where not only had they reported on experiments that had been provided for them to conduct, but also information within worksheets had informed their writing.

Above I have shown how Winnicott’s (1971,1989) ideas about play help to conceptualise how the module ADDE might provide students with the potential to play in transitional space in a number of different academic play spaces.

In conclusion I have aimed to set the scene theoretically and empirically by providing an introduction to the module ADDE. This has included, not only a description of Winnicott’s ideas about play, but has also shown their relevance to the module. Finally I

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<sup>2</sup> The statistical concepts taught during the course might be viewed by course designers and teaching staff as ‘threshold concepts’ (Meyer and Land, 2003, 2005,2006).

have presented the different academic play spaces within which the ADDE module invited the students to engage.

In Chapter 7 I report the students' experiences at the beginning of the module when they were starting to create their experimental designs within the laboratory.

## Chapter 7

### **Experimental academic play within the laboratory: Becoming a creative experimenter**

My aim in this and the following chapter is to examine the students' experiences of academic play in the laboratory when invited into the different play spaces provided by the module Analysing Data and Designing Experiments (ADDE). In this chapter I begin by reporting on the students' initial reactions and personal development in the first two weeks of studying the module when they were required to design an experiment to be conducted as a mini-project in weeks 6 and 7. In Section 7.1 I outline the teaching perspective provided by George, the Course Convenor, and in Section 7.2 I report on the students' different experiences. I then explore whether the students' viewed experimental academic play as 'me' (Winnicott, 1960c: 17) and whether they gained a sense of 'aliveness' (Winnicott, 1971:76) for their discipline when creating their own experimental design.

Within this chapter I begin to address all three of the research questions and will continue to do so in the following empirical chapters:

*1. What transitions are experienced by individual second-year undergraduate Biological Science students when invited by teaching staff to engage in potential academic play spaces ? How do they react and cope?*

*2. In what ways do students' 'inner' capacities to play facilitate, or hinder academic play? Can students' capacities to play be conceptualised as developing in transitional space?*

*3. How does the provision of 'outer' holding environments facilitate, or hinder students' capacities to play within transitional space?*

## **Analysis**

The empirical data detailed within this chapter is drawn from the multiple methods outlined in Chapter 4, including: semi-structured interviews, documentary evidence in the form of course handouts and the students' 'letters to a friend' and non-participant observation. Between and within case analysis (Miles and Huberman, 1994) was undertaken using the key thematic codes as outlined within Chapter 4 'Research design'. I also draw upon Savin-Baden's (2000; 2008a; 2008b) notion of disjunction. Further, I have also found the ideas of Vemunt and Verloop (1999) generative, discussed below.

Vemunt and Verloop (1999) have proposed that the teacher and student regulation of learning may be viewed as a continuum ranging from very little to high, with all intermediate positions possible. When a student has a high level of independence they can use their own initiative in order to master a learning activity. In an intermediate level of regulation the student has a relative amount of independence and can master a learning activity to a limited extent, and in a low degree of regulation they are dependent and unable master or use a particular learning activity.

In terms of teacher regulation, strong regulation involves the teacher using a strongly controlled instructional strategy where there is a tendency to take over many of the learning and thinking activities from the student. This type of teaching is congruent to students who are dependent and unable to take responsibility for a learning activity. In shared regulation congruence occurs when students have acquired some skill in employing a particular learning activity, but are still in need of further development. Constructive friction will take place if students are unable to undertake a learning activity independently, without the presence of an expert. Destructive friction may occur if students are independent and capable of mastering a learning activity and become irritated if they are continually instructed to use these learning activities. Finally, in loose teacher regulation, congruence occurs when students are proficient in mastering a learning activity, or are on their way to be proficient. However, destructive friction may occur if the students are unable to master the learning or thinking activities and their dependence upon instruction is high.

Thus, Vermunt and Verloop (1999) advocate interplay between teaching and learning aimed at promoting congruence and constructive friction. In these conditions I suggest that students can move their learning transitions forward, avoiding destructive friction that hinders transitions.

So, these ideas allow me to label the students different experiences of transition, that is, congruent (smooth); constructive friction (hindered); and destructive friction (stuck). I propose that if students are stuck they might have experiences akin to being in a liminal space (Meyer and Land, 2003,2005,2006). Further, Vermunt and Verloop (1999) aid the

illumination of the holding environmental provision allowing me to determine if it is good enough in the mind of the learner.

I now examine the perspectives of the Course Convenor, George.

### **7.1 The laboratory: An experimental academic play space**

*'I know that one way of cooking sausages is to look up the exact directions in Mrs Beeton (or Clement Freud on Sundays) and another way is to take some sausages and somehow to cook sausages for the first time ever. The result may be the same on any one occasion, but it is more pleasant to live with the creative cook, even if sometimes there is a disaster or the taste is funny and one suspects the worst'* (Winnicott, 1970:51) (original emphasis).

I draw attention to Winnicott's description of both the compliant and the creative cook because it connects to a key transition that the students were required to undertake during their study of the module ADDE. This transition involves the movement away from compliance towards being and becoming an independent, creative Biological Science student. This is a shift away from previous, first-year undergraduate laboratory instruction in which students are more dependent upon the staff and comply with their instructions. This is characteristic of what Domin (1999) describes as 'expository' (p.543) laboratory instruction style which is typically *cookbook* in nature and involves students following the teacher's instructions from a manual or protocol and the outcome of the experiment is pre-determined. In contrast, at the start of their second-year the module ADDE provided students' with the opportunity to become more creative and independent learners within the laboratory by designing and conducting their own

experiments. Before dealing with the students' experiences of this transition I consider the views of the Course Convenor, George, about the laboratory teaching and learning environment provided for the students studying ADDE.

### **The Teaching Perspective**

In order to gain a more holistic understanding about the delivery of module ADDE and the transitional experiences of the students studying it, the Course Convenor, George, who acted as a spokesperson for the Biology Department, was interviewed on two occasions and thus provided insights from a teacher's perspective. George's views are now discussed.

George saw the laboratory environment as presenting the students with greater 'freedom' as learners, but indicated that this freedom, which Creme and Hunt (2002) suggest comes with play, could lead to uncertainty in the minds of the students:

*I think students are uncertain when placed in a situation where they are given a lot of freedom. I think that is partly manifested by the questions that you get in the practicals themselves, 'Is this the right way to do it?' They don't really ask very much like, 'Is this what you want us to do?' But they do have questions along those lines, as if they are thinking that there is a right answer [...] So I think there is a strong degree of uncertainty when they have to think about ideas for themselves. [T2/59 2008]*

This view resonates with Winnicott (1969) who discussed the sense of freedom in terms of the psychological health of the individual. Drawing upon the political situation within many countries in the first half of the Twentieth Century as an example, he



explained that it is 'possible for people to be frightened of freedom when they are given it after it has been disallowed' (p.229). Thus, in terms of Higher Education (HE), if there are changes between learner freedom and teacher control, tensions might result (Barnett, 2007; Savin-Baden, 2000; 2008a; Vermunt and Verloop, 1999).

The idea that students think that there is a 'right' answer is characteristic of what Savin-Baden (2000) has described as 'disjunction' (p.57) that is often accompanied by anger, frustration and also the need to have the right answer in order to bypass any difficulties that have been encountered. George commented further:

*I think the concern that students have is that they can't get out of the idea that there is a 'right' practical [experiment] which we have in our heads and they are going to either find it, in which case they get high marks, or not find it, in which case they get low marks. But we are perversely refusing to tell them at the outset what it is and they have to sort of blunder their way through to do the thing that we had in mind all along. And I think that's one thing that they can worry about and it does take a lot of reassurance that there is no sort of specific thing in our heads - the best way to do this. And so I think that is something that they worry about, the idea of well, 'What should we be doing?' And that takes them a while to realise that there is no secret agenda, as it were.*  
[T2/28 2007]

George is conscious then that students might face worry and difficulties when placed in a laboratory environment where they take on new responsibilities for their own thoughts and actions. This contrasts to the students' prior experiences of conducting experiments according to the instructions of the teacher and producing a 'right' pre-determined

answer. As noted by George, students have to ‘blunder’ their way through the creation and conduct of their experiments, and he accepts that student discomfort or uncertainty is unavoidable during this learning process. But instinctively, George knows that in order for the students to learn, they need reassurance. In other words, the students might require the provision of what Winnicott (1971) has termed as a facilitative ‘holding’ (p.150) environment, which provides enough support for the individual to feel safe and confident to play.

In addition, a unique feature of the module, as indicated in George’s comments below, is the open-endedness of the students’ experimental design, in which they will not necessarily know the result, or outcome of their experimental work:

*The other thing is, that is really unique I think, is that the practical course is free for them to decide which direction it takes. So in a typical undergraduate practical they would come in and they are given a protocol and they would say ‘Okay, I understand the protocol and I work through all the instructions in the protocol and I will get the results at the end according to a strict protocol’ which people like us would have tried out and practised before hand. In this case [ADDE] it is more, ‘Here are the animals that we have got [...] now think of a project’. So, there is much more open-endedness in the project design. [T1/39 2006]*

The laboratory environment therefore, offers students the potential to engage with and experience a space where they are free to play with their ideas, where there is no single ‘right’ or ‘correct’ pre-determined experiment. Hence, they move away from the compliance associated with the provision of experimental protocols. But George states

below that this new open-endedness causes difficulties for the teaching staff, indicating that a holding environment is not easy to provide:

*So, there is much more open-endedness in the project design. And that is of course difficult in a way - it is difficult to supervise and it is difficult to assess because if you encourage people to do open-ended things you can't be too strict in saying, 'Well that is a silly idea'. You've got to allow them to have their heads with it. [T1/12 2006]*

Overall, George viewed the laboratory as presenting a learning environment that raises concerns in the students:

*I would say there are concerns raised in the students because it is unusual for them to do it in this way [the laboratory experimental work]. But I should say that for the vast majority of the students, to design their own experiments is a positive, rather than a negative. [T2/29 2008]*

Above, George's comments focus upon the students' freedom, concerns, uncertainties and potential difficulties as well as the opportunities it offers. These ideas connect well to those surrounding the association of pedagogy and Winnicott's transitional space and play as discussed in Chapters 3 and 6. Thus, the laboratory environment might be viewed as pedagogically 'risky'. To illustrate, George noted that the open-endedness of the experimental design makes it difficult to hold the students and therefore, it could result in students having 'silly ideas'. In other words there could be an 'epistemological' risk (Barnett, 2007: 143) by which I mean that when students are given the freedom to design their own experiment with the potential to find and create knowledge for themselves it might lead to a 'warped perspective or skewed

understanding' (p.143). Of course, this can happen with other pedagogical methods too. Furthermore, George stated that the freedom provided to the students might result in students thinking that there is a 'right' answer, characteristic of the sense of disjunction and the sense of unintegration of self. Hence, the freedom to learn might also provide an 'ontological' risk (*ibid.*:143).

Overall, George seems to be instinctively aware that when students are given freedom, they will need reassurance in order to move their learning forward. This indicates that he is aware that the students will need what Winnicott (1971) calls a facilitative, holding environment. Yet, it is clear that George thinks that despite the difficulties and worries that the students might face, there are benefits because the students will move their learning forward positively, with an 'ingrained' understanding. In other words, uncertainty and risk are a necessary and worthwhile aspect of learning:

*It is a [teaching] method which people [who] have used [it] in the past have advised me [that] it actually makes the messages that come home, through. It makes them more ingrained in people's thinking afterwards because they have actually thought it through themselves. [T1/68 2006]*

To conclude, I have argued that the ADDE laboratory invites students to take part in transitional experimental academic play, where students have the freedom to create their own ideas in relation to others, where ideas are neither right nor wrong, but speculative. In this way learning might become personally meaningful.

## **7.2 Students' experiences of experimental academic play within the laboratory**

In this section, I draw upon Winnicott's ideas about transitional space and play to examine individual students' different experiences of transition within the laboratory. It is proposed that the laboratory environment provided by the module ADDE offers students the opportunity to open up and engage in adult creative play within transitional space. In this space, by creating their own experiments, the individual is free to bring him / herself into relation with designing an experiment involving new knowledge and unfamiliar academic experiences, and shape what one is doing by playing with different ideas. It is argued that it is akin to children engaged in imaginative play. The students' capacity to play is discerned in the way they 'find the bits they can use' (Phillips, 1988a: 86) in order to create an experiment of their own making. In so doing, the students need to bring together two domains, namely, their academic knowledge and the experimental design as they move to become a more independent, creative Biological Scientist.

Firstly, I provide a recap of the students taking part in the study as detailed previously in Chapter 5. Table 7.1 is presented overleaf where the students' names are ordered alphabetically. It shows the students who worked together within the laboratory, the experimental animal they worked with and a brief description of their experimental design.

**Table 7.1**

<b>Name of students</b>	<b>Experimental animal</b>	<b>Description of the experimental design</b>
Alan and Ben *	Flies	An investigation into the frequency of mating behaviour of wild-type flies ( <i>Drosophila</i> ) at different light intensities
Angela Kate and Nicky*	Crickets	The experiment concerned male crickets' aggressive behaviour and investigated two hypotheses: If aggression is influenced by (a) body size and (b) The presence of a burrow
Matthew	Chicks	An investigation to see if chicks can be conditioned to peck one colour of rice
Ryan	Crickets	An investigation into male crickets' burrowing behaviour at different light intensities
Wendy	Chicks	An investigation to determine if conspicuous colours affect chicks' pecking behaviour

\* Students taking part in this study who worked together in groups

**An overview of the students' experimentation within the laboratory**

The following accounts of the individual student's experiences of the transition to become independent creative Biological Scientists within the laboratory show that it was experienced in different ways. Drawing upon the ideas of Vermunt and Verloop (1999) outlined earlier, I have clustered their different transitions into three main strands, although variation is shown within the strands. Firstly, in *Group A*, Nicky and Ryan reported a gentle, smooth transition. Secondly, *Group B* includes four students: Alan, Matthew, Kate and Angela showed that although they were able to engage in play, they reported experiences that initially hindered them. In order to overcome these potential obstacles, the students had to draw upon previous experiences and develop their personal qualities and capabilities in order to move forward. Their experiences therefore, bear similarity to Winnicott's idea that the first stage of the creative process

involves ‘preliminary chaos’ (Milner, 1978:37). This involves initial fruitless attempts followed by the ‘fiery flashes’ (*ibid.*:37) of creativity. Finally, *Group C* comprising Wendy and Ben, who both reported a sense of separation and loss caused by the movement away from being compliant within the laboratory. This separation and the responsibility associated with the freedom to create their own experiments resulted in both Wendy and Ben being ‘stuck’ in their learning. Hence, they seem to sense an initial disengagement and inability to play within transitional space, an experience more characteristic of being in a liminal state (Meyer and Land, 2005,2006).

I now move on to present the students’ experiences which have been divided into the three main strands described above, as shown in Table 7.2.

**Table 7.2**

Names of Students	Experience of Transition
Nicky and Ryan	Smooth / congruent <i>(Group A)</i>
Alan, Angela, Kate, Matthew	Hindered / constructive friction <i>(Group B)</i>
Ben and Wendy	Stuck / destructive friction <i>(Group C)</i>

**The students’ experiences of experimental academic play**

Attention will now be turned to the students' transitional experiences beginning with the experiences reported by Nicky and Ryan in *Group A*, followed by the more difficult transitional experiences detailed by *Group B* and *Group C*.

### **1. Group A: Cases of a 'continuity of being'**

The reports offered by Nicky and Ryan's (*Group A*) suggest that they experienced a smooth transition to becoming creative within the laboratory. Both indicated that their prior experiences had aided their transition, which concurs with Winnicott's (1950b) idea that cultural experiences act to form a bridge leading from the past into the present and on into the future. This, he proposed is important for a sense of '*continuity of being*' (p.28) (original emphasis). Nicky considered herself adaptive to change because her previous educational experiences involved frequently changing schools, due to her father's employment in the Royal Air Force (RAF). Similarly, Ryan thought that his study of the International Baccalaureate had been challenging, but in turn, had prepared him well for studying at a university. Nicky's comments below show that she was helped by a sense of herself and her group members feeling capable, a capacity she seemed to have personally developed during the first-year as shown in Chapter 5 and by trust in the facilitative environment provided by the staff:

*Yeah but we got loads of guidance there [in the laboratory] as well - not like being spoon-fed, like we were in the first-year. We were given hints and points and then we got to design our experiment and at first - 'cos I thought, 'Oh no we've got to design and conduct our own experiment.' But actually when it came down to it we were all capable of doing it - it was just something that we hadn't done [before], that's all. [T2/2*

2007]



*So it is much more based on what you're doing, rather than being told what to do. But I do quite like the way it has been done. It has sort of brought us into it gently.* [T1/96 2006]

Therefore, as well as Nicky's ability to put herself easily into relation with designing an experiment, she appears to view the support available to her in the laboratory environment to be 'good enough' (Winnicott, 1971:187) to play within. Ryan also indicates that he saw the laboratory as a safe environment where he has the confidence to play. He was pleased to be creating an experiment, showing that he was able to open up and play within transitional space which 'me' (Winnicott, 1960c:17), where he can easily put his inner self in relation to the outer environment:

*I definitely like the fact that we can design our own experiment because I enjoy that creative aspect of the work, rather than doing an experiment that has been given to us.*  
[T1/98 2006]

*I was happy, this is my 'thing' coming up with ideas and discussing it with other people.*  
[T3/18 2007]

I now turn to Alan, Angela, Kate and Matthew in *Group B*.

## **2. Group B: Cases of hindrance before engagement**

Alan, Angela, Kate and Matthew all reported experiencing various hindrances before being able to engage in creative play.

## Restricted play

Firstly, Alan stated his general thoughts about the laboratory environment in his first letter to a friend:

*There are no real formal boundaries like you get in the lecture theatre and it's quite a dynamic lively environment.* [L1.P2. 2006]

Alan's comments indicate that he viewed the laboratory positively as a free environment. But, when writing more directly about designing his experiment Alan, reported that he felt that his creativity was restricted:

*I find the actual experiment somewhat uninspiring, not least because of the pseudo-flexibility of our experimental design (here, our creativity was restricted by the set type of apparatus we had at our disposal in the first place).* [L1P3 2006]

When asked to talk about his letter to a friend during his first interview, conducted after the first two weeks of experimentation<sup>3</sup>, Alan stated that he would have liked a wider choice in what equipment he could use. In addition, he felt constrained because the experiments were limited to examining animal behaviour:

*It was a pseudo open-endedness wasn't it? Because you could only use a light - so there was something to do with the light and then there was something to do with the different mutations [in the fruit flies]. So you were limited. It was a kind of no open-endedness at all, no flexibility. You couldn't like, study the genes or anything.* [T1/26 2006]

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<sup>3</sup> See module timetable in Chapter 6

Although George's earlier comments clearly view the students' experiments as open-ended, in contrast, Alan's comments show a perception of inflexibility and a false open-endedness where he is restricted to play within a disciplinary field. Alan's experience therefore was one in which limitations were imposed on his capacity to play creatively, indicating that he had a greater sense of what Winnicott (1960b) termed as 'false self' (p.140-152) acquiescing to the course demands rather than experiencing an authentic, creative self. Mann (2001) has argued that students may feel alienated from academic tasks, if they are unable to experience and work from their own desire and creativity. However, I will demonstrate in Chapter 8 that this experience only initially hindered Alan who did engage in experimental play within the laboratory, despite feeling restricted and in doing so, took on an unfamiliar role where he 'surprised' (Winnicott, 1950a: 16) himself by leading the creation of his group's elaborate experiment.

### **The freedom to play**

The rest of *Group B* Angela, Matthew and Kate all expressed various uncertainties within the laboratory before being enabled to engage in play, demonstrating overall that they did not have the sense of continuity, as reported by Nicky and Ryan in *Group A*. However, in contrast to Alan's experience of limitation, their uncertainty was due to the freedom and independence associated with becoming creative Biological Scientists.

Angela, Matthew and Kate, reported that in the first laboratory session they had no knowledge of the experimental animal they were working with. Previously within first-year laboratory classes, the students had been provided with the information they required, but now they had to access this knowledge for themselves. Therefore it appears that these students were initially unable to have what Winnicott (1961) saw, as

being the ‘*creative impulse appearing as a new question*, i.e. dependent on knowledge of existing knowledge’ (original emphasis) (p.17). This means that an individual will need to have cultural experiences and inner knowledge to act as a bridge between past and present (Winnicott, *ibid.*) in order to formulate a new question, or hypothesis to address. The students’ experiences are discussed below.

Kate entered university through the clearing process and had originally wanted to study medicine. The quotation below shows an initial hesitation to engage due to her lack of prior knowledge. It also highlights her feeling of worry associated with the freedom to seek out and use knowledge for herself. This reflects George’s comments that students may experience uncertainty when they have to think of ideas for themselves, running an ‘epistemological risk’ (Barnett, 2007:143). However, though Kate worries, she is prepared and feels capable of facing the challenge of freedom:

*In our last practicals [in the first year] we had a project or a book we were working through. Whereas this, I think what would have been more helpful in the first session - it would have been nice to know what animal we had [beforehand] because we knew nothing about crickets. We didn’t know what the chirp meant or what the fluttering of the wings meant, so that would have been slightly more beneficial. But it is quite nice to have the freedom to learn these things for yourself, but you always have the worry that you are barking up the wrong tree or you could get better ideas from something else.*

[T1/8/2006]

Angela, who had worked within a professional laboratory during her gap year, also

demonstrated that she needed to bring herself into relation with new knowledge to engage in creative play and this was accompanied by a sense of uncertainty:

*I mean when we first went in that lab and we were given the organisms [crickets] I thought, I don't know where to start. I don't know what this does. I don't know what its behaviour is. I don't know how it acts. I don't know anything.* [T1/45 2006]

*In the first few weeks when we knew nothing, that was almost daunting because it seemed so vast, the scope of what we could do and what could happen.* [T2/32 2006]

Likewise Matthew, indicated his lack of knowledge about the experimental animal (chicks) and his awareness that the module was challenging:

*We were just left with some chicks in a box and we didn't know anything about them. But I suppose being thrown in at the deep-end was part of the challenge.* [T1/19 2006]

Matthew, Kate and Angela (*Group B*) all reported similar transitional experiences, but Matthew and Angela went on to show further variation. Firstly, both students stated a feeling of being 'thrown in at the deep-end'. Such experience resonates with the idea of creative chaos discussed previously and also, Barnett's (2007) ideas that learning in HE is like a bungee jumper leaping into a void. This 'pedagogy of air' (p.1) requires the learner to have the courage to take on risk and uncertainty. Yet, while both students saw this as a challenge to face, Angela reported a sense of separation, moving away from being compliant which was felt as a 'shock'. This was also because Angela's inner knowledge of how she views the conduct of science seems to have been challenged:

*It was quite a shock not to be told what to do. I mean last year we got a booklet [with] step-by-step instructions and then write a report - everyone was going to do the same. Whereas this year, being told on the first day to do some experiments with these things [the crickets] and I thought, 'What do we do?' You know? That is quite a big challenge to have to, well, find something that you want to ask about them in the first place. It is more of a challenge as well to be given that starting point because if you were doing your own independent research and said, 'I want to find out about this and therefore, I'll do this experiment' whereas, they've said, 'You are going to do this experiment - do something.' So that is quite hard, I found it hard being thrown in at the deep- end. [T1/82 2006]*

Angela's comments above also show that she found it difficult to define a question to investigate. This connects to Matthew's further reported difficulty that also relates to the open-ended nature of the experiment. The students were free to decide the direction that their experiments would take, and Matthew overcame the task of formulating a precise hypothesis based upon the ideas with which his group had played. This difficulty concurs with Taylor (2006) who has identified formulating a hypothesis as being 'troublesome' and possibly representative of a 'threshold experience' (p.95):

*Just starting it, to define it at the beginning 'cos we had this idea, so it was getting all our ideas and all these different things into one set question that we were going to try and answer - so how to get that into one hypothesis-prediction and stuff, was quite tricky. [T2/15 2006]*

However, despite experiencing such difficulties, both Matthew and Angela were able to shift towards readily engaging with the academic play. Matthew was enabled to move

on to open up and play within transitional space by putting himself into relation with what he thought the teaching staff required. This appears to have resulted in creative experimental play and he shows an increase in confidence:

*It was quite hard cos we were kind of dropped into the deep-end and I didn't understand what we were supposed to do and then I quickly realised and I picked it up, what they were getting at. I saw the purpose of the module. I thought, I see what they [teaching staff] are doing here, they are wanting us to find our own parameters with a bit of experimental equipment they have given us and it doesn't really matter what the equipment is or what animal it is, it is just kind of the parameters you get and how you write about it. So yeah, once I kind of figured that out in my head, I realised 'that's okay'. So I just made up a few parameters and tested a few things and we came up with one [an experimental design] that we thought should give us some good sets of results and the little preliminary ones [experiments] worked well, so it should be fine, hopefully. [T1/22 2006]*

Angela was facilitated by the provision of transitional objects within the holding environment provided by the teaching staff in the form of experimental equipment and 'starter' journal references. Winnicott (1951) proposed that objects and phenomena in the 'outer' world might become transitional if they are found and used creatively by the individual and help to ease a sense of separation:

*In a way there is some guidance as well, I mean we are given egg boxes and we read the papers [from the 'starter' references] that they give you. Okay well, so you think, well there must be something there - there is something about burrows, or there's*

*something about the females? Or are you supposed to mark your crickets? We have been given some paint. So I can see that is a bit of control and there is a bit of guidance as well.* [T1/34 2006]

Therefore, in contrast to Alan who experienced constrained creativity because of what he viewed as a limited set of experimental equipment, such provision enabled Angela's transition helping her to begin to make connections. This environmental provision was also reported as helpful for Nicky's (*Group A*) smooth transition. This demonstrates that these individual students required different levels and types of holding in order to feel confident enough to play.

To summarise, Alan, Angela, Matthew and Kate (*Group B*) all indicated that they experienced potential obstacles before being enabled to engage in creative play. An experience common to Angela, Kate and Matthew was a lack of prior knowledge about their experimental animal that seemed initially to hinder their creative impulse (Winnicott, 1961). Yet overall it would seem that for the students in *Group B* the balance between the holding laboratory environment and their capacities to play, what Vermunt and Verloop (1999) term as 'constructive friction' (p.270) was 'good enough' (Winnicott, 1971:187). Therefore, the environmental provision was facilitative for the students in *Group A and B*. However, the alternative is 'faulty holding' (Winnicott, 1960:18) or 'destructive friction' (Vermunt and Verloop, 1999: 270) in which the environment does not provide good enough support in terms of the individual's capacity to play. This situation seems to apply to the experiences of Ben and Wendy in *Group C*, who reported a need for instruction and greater help in order to move away from



being ‘stuck’ in their learning and feel safe and confident enough to play. The experiences of *Group C* are outlined below, starting with Ben’s account.

### **3. Group C: Cases of being stuck**

Ben, who studied Medicine before starting his Biology degree, worked within the same group as Alan. He indicated a sense of loss and separation, caused by the movement away from teaching staff instructing him what to do. Whilst Angela in *Group B* reported a similar experience, she was enabled to move on to play, but Ben seemed to be stuck. He appeared to be scared by the freedom to play creatively and as a result, said that he ‘pleaded’ with staff and wanted to be shown the ‘right’ experiment to conduct, indicating that he thought there was a game to play:

*We were hoping to pick [George’s] brain and basically get him to tell us what we were supposed to do. We tried at the start of the session to basically [...] and we even also asked the PhD student [acting as a Teaching Assistant] to try to get her to tell us what we were meant to do. And we tried to get [George] over to try to ask him and basically, just plead and just look as if we didn’t know what we were doing and hopefully to get him to say, ‘Here is a good method, why don’t you try this?’ But it didn’t really work and so we were just left with our method. [V1/15 2007]*

Ben therefore, displayed a characteristic associated with the sense of disjunction: the desire to be told the ‘right’ answer in order to bypass engagement with difficulty. Like children requiring an environment to feel safe to play within (Winnicott, 1971), when learners are stuck they tend to retreat to places of safety (Savin-Baden, 2008a). Ben demonstrates his need to be ‘held’ by saying that he wanted more of the reassurance that George stated students might need:

*You just want someone to say, confirm your experiment is good or bad before you start, before you get to the end and you're just going 'Oh no!' I think it would help if someone said, 'That might not work' or 'That is a good experiment.' Something like that beforehand or, 'I think that you should look at that, maybe.'* [T2/6 2006]

Wendy, also in *Group C* indicated that she was stuck and wanted to be told how to create an experimental design, rather than engaging with creative play:

*Wendy: I find that quite hard. Yeah, because I don't know how to design experiments for the chicks - I need to know [more] information about chicks and how to work with them.*

*Helen: I did notice that they didn't tell you things like that?*

*Wendy: I don't know, I was maybe daydreaming, so I didn't hear it [laughs]. I mean [George] was saying very technical things like [the] statistics - but not about how to design experiments for the chicks.*

*Helen: Yes, he was talking about the hypothesis and null hypothesis?*

*Wendy: Yeah - but we don't know actually how to do it.*

*Helen: So, do you feel? I don't know. How do you feel about that?*

*Wendy: Actually, I'm not confident in this. I need to talk to my group mates.*

[T1/52 2006]

Wendy also appeared to experience a sense of separation and disjunction caused by the freedom and responsibility associated with playing creatively. Her comments are similar to Ben's in that she had an expectation that George should provide her with the knowledge and information she needed and this loss of dependence has caused Wendy's lack of confidence within the laboratory environment. As suggested by

Winnicott (1971) a transitional space ‘happens only in relation to a feeling of confidence’ (p.135) on the part of the individual. In other words, a lack of confidence could result in the individual having difficulties creating and engaging within transitional space. So, she has an alternative way of thinking and has perhaps moved into liminal space where stuck-ness is located (Meyer and Land, 2005, 2006; Savin-Baden, 2008a, 2008b).

Therefore both Wendy and Ben who were stuck in their learning experienced ‘destructive friction’ (Vermunt and Verloop, 1999:270) within the laboratory where they are dependent upon help and instruction. Thus, they are unable to open up transitional space and make the connections needed to play. In Winnicott’s (1971) terms, Wendy and Ben require a greater level of holding in comparison to the other students. Wendy though, indicates that her group will provide the aid she needs. I will show in Chapter 8 that Wendy and Ben were facilitated to move away from being stuck through the help of their group members.

To conclude, the students’ transitional experiences of creative play within the laboratory have revealed three main points. Firstly, their accounts show that the individual students displayed a variety of transitional experiences which can be categorised into three different levels: smooth, hesitant, and stuck, although there is variety shown within. Secondly, it is clear that the freedom to be creative within the laboratory resulted in the students requiring different degrees of ‘holding’. The six students belonging to *Group A and B* were able to open up and engage in creative play more easily and required little or no teacher support. However both Ben and Wendy in *Group C* found taking the responsibility for creating an experiment to be more difficult

and required a greater level of holding. Finally, as noted at the start of this section, the students' experiences demonstrate the potential nature of transitional space. That is, the learners must have the capability to open it up and play creatively within it, although they also need the safety provided by a good enough environment in order to do so.

Earlier it was noted that Mann (2001) suggests that students might feel alienated from academic tasks if they feel unable to use their own desire and creativity. The following section now moves to consider whether the students experienced a sense of aliveness or 'academic love' (Rowland, 2005: 92) and a feeling of true authentic self when creating their experiments. This is important to consider because it might facilitate transition (Winnicott, 1971) as a result of creative play.

### **7.3 Experiencing experimental academic play as 'me' with a sense of aliveness**

This section draws upon the idea that during creative play an individual will experience what Winnicott (1971) termed a sense of aliveness and a feeling of true, authentic self, borne out of a positive experience of transitional space. Winnicott (*ibid.*) wrote, '[I]t is creative apperception more than anything else that makes the individual feel that life is worth living' (p.87). This contrasts to a feeling of false self (1960b) where the individual complies and fits in with the outside world. Winnicott associated this with a sick basis for life that is futile and not worth living. The aim of this section therefore, is to explore whether experimental academic play within the laboratory resulted in the students gaining a sense of aliveness and true self and in the following empirical chapters, it will be considered further whether this facilitated or hindered the students' transitions.

The students’ experiences outlined below show that Nicky and Ryan (*Group A*) and Kate and Matthew, Angela and Alan (*Group B*) demonstrate aliveness in various ways in relation to their creative play. On the other hand, Wendy and Ben (*Group C*), who are stuck and unable to open up transitional space, indicate that they sensed the alternative to aliveness, that is the feeling of false self and compliance (Winnicott, 1960b) towards the course demands. Table 7.3 shows the students’ experiences.

**Table 7.3**

Students	A sense of aliveness
Nicky and Ryan ( <i>Group A</i> )  Alan, Angela, Kate and Matthew  ( <i>Group B</i> )	Yes
Ben and Wendy ( <i>Group C</i> )	No

**The students’ different senses of aliveness**

The students’ accounts are now examined, starting with *Group A*.

**1. Cases of ‘aliveness’**

Ryan (*Group A*) who is studying Zoology and Nicky, who is studying Biology, appeared to experience congruence within the laboratory and both expressed their interest and enthusiasm when asked about creating and carrying out their experiments. This indicates that they possessed a sense of aliveness and true self within transitional space. Ryan, as noted earlier, particularly enjoyed the opportunity to be creative

because it appears to be ‘me’. This seems to have helped him overcome the challenges this transition presented:

*I was interested in them – the crickets [...] It definitely was challenging [designing an experiment], but at the same time, because I really like coming up with my own thing, I enjoyed it more. I enjoyed the challenge of coming up with my own experiment with other people in my group. Giving ideas and being creative is another thing that I definitely enjoyed. [T2/18 2006]*

In her first interview Nicky (Group A) stated that she enjoyed laboratory work and indicated that she had positive experiences when actively engaging with the experimental work. Similarly, when commenting upon the module ADDE, she said that through creating and conducting her experiment she was able to forge connections between her inner academic knowledge and the outer, scientific theory, because the science had become, as she put it, ‘real’. Thus she was able to put this into relation with how she views science. This concurs with Winnicott’s (1971) ideas about play as ‘doing’ (p.55):

*I really enjoyed it because it is all very well when you are learning things in theory, but we were actually doing it and actually seeing what was going on and we were actually initiating the practice of what was going on. [T2/16 2006]*

*I really enjoy it [designing experiments]. It is so different because you always learn things in theory, but it doesn’t always ‘click’ in my brain because it is so small, or it doesn’t really relate to anything. [But] when you actually do it, it makes such a difference and you’re actually seeing it happen and it is real, you are like, ‘Oh they*

*[crickets] do display aggression and this is why, this is how they do it. 'This is the different stages [of the crickets behaviour]' and you haven't just read about it in a book [...]. It is a shame that it is the only one [module where students design experiments] because that's what science is all about - forming ideas and putting them into practice.*  
[T2/19 2006]

In contrast, Kate (*Group B*) who worked with Nicky and seemed to initially experience worry due to the freedom associated with creative play, wrote in her second letter to a friend:

*I'm not an experimental person.* [L2P1 2006]

Thus, Kate, who was studying Human Genetics, saw experimentation as being 'not me'. However, she was able to surprise herself, indicating that learner freedom became 'me' aiding her to develop as a non-compliant learner:

*I really enjoyed it. I did really enjoy it actually. I was really surprised that I did enjoy it, but I did. It is one of the few modules where you get to learn principles first hand and not have them just talked at you. It was definitely a better way of teaching [...] I think because this is the only kind of module where you get the chance to perform experiments from scratch not, 'You are now going to clone this or, you are going to put this bacteria here -you are going to do this'. But where you are going to do your own thinking.* [T3/17 2007]

As noted by Winnicott (1950a) by living creatively, ' [e]very day you [find] yourself surprising yourselves acting or not acting in a way that exactly fit [ted] the situation, as much as Hamlet's speech "To be or not to be" fits into the exposition of the theme of the play exactly' (p.16). Therefore, engaging with play within transitional space is not

necessarily the ‘consequence of a pre-existing fit between what the learner brings and the object of study’ (Creme, 2008:52-53).

The freedom to learn, in which students plan the conduct of their experimental work is also reflected in the comments made by Nicky (*Group A*), Kate and Angela’s (*Group B*) group below. Here they emphasise that because they have the responsibility to design their experiment they now know what they are doing which contrasts to their previous experiences within the laboratory. This suggests that these students experienced Winnicott’s (1950a) second phase of learning, as described in Chapter 3 where they are, ‘*acting as you feel... enabled to have the power to see more and more clearly what you are doing and why*’ (original emphasis) (p.14). As stated by George earlier, because they have thought it through for themselves their understanding of their experiment has become more ‘ingrained’:

*Nicky: It is quite nice to know what you’re doing isn’t it? Because if you go in - and like in the first year I would just go to some of the practicals and I just wouldn’t understand a thing.*

*Kate: And that is really demoralising I mean –*

*Nicky: Everything I was doing I was like, what?*

*Kate: Maybe a lot of people just don’t mind that much. But once you get there and you can’t do something. You don’t know what you are doing. It is like, oh bum! [All laugh]*

*Angela: Yes and then you think it is a waste of time and you resent it even more*

*Nicky: Yes. It just becomes boring and it’s demoralising, like you say. [V2/60 2007]*

Therefore, these students were aware of the compliance involved in the first-year laboratory practical classes, where the instructions are provided. This appears to have



borne out the sense of a false self in which boredom and a feeling of demoralisation is evident. In contrast, they seem to now be experiencing a sense of true self when given the freedom to learn and be creative. As stated by Winnicott (1971):

*‘In a tantalising way many individuals have experienced just enough of creative living to recognise that most of their time they are living uncreatively, as if caught up in the creativity of someone else, or of a machine’ (p.87).*

Matthew’s (*Group B*) letter to a friend also conveys his sense of aliveness when designing his own experiment. As reported in the previous section, Matthew seemed to experience constructive friction within the laboratory, but he was quick to put himself into relation with designing his experiment. Like Kate, Angela and Nicky above, his ‘letter to a friend’ shows that the freedom and independence to create an experiment is ‘me’, as opposed to being a ‘force-fed’ compliant student. Similarly to Nicky, he reported the experimental work as feeling ‘real’ in which science is conducted in a way he can learn in relation to:

*The laboratory work was especially enjoyable and I learnt a lot. We were asked to design our own experiments using young chicks. This was really good as it enabled us to think for ourselves and come up with something to investigate without being force-fed information. It was really different to other lecture-based modules and so was a nice change in that sense. The individual nature of the lab. work made it [the experiment] more enjoyable and I learnt that experimental work is about what as a scientist we want to investigate, not what the teacher wants us to find out. It was also nice that unlike most practicals I’ve done in the past where the outcome is generally*

*known before one starts; this was real science with no known outcome. [L2P1 2006]*

I now examine the experiences of Angela and Alan (*Group B*).

### **Finding aliveness within a 'foreign' disciplinary field**

The Biological Sciences have a large 'academic tribe and territory' (Becher and Trowler, 2001) in which the knowledge in different disciplinary fields and at disciplinary borders might be perceived as foreign or alien (Perkins, 2006). Although Angela (*Group B*) indicated earlier that she had gained a sense of aliveness through the freedom to play creatively, it was found that both her and Alan (*Group B*) reported their lack of interest in their experimentation, particularly in terms of studying animal behaviour. This suggests that they saw moving into this disciplinary field within the Biological Sciences as 'not me'. Here it is useful to consider that George noted the difficulties of teaching a diverse range of students in which he indicates that the holding environmental provision is not perfect, rather, in Winnicott's (1971) terms, it is good enough:

*You're always in a situation of having a class with heterogeneous students. Heterogeneous in terms of their prior knowledge, in terms of their abilities and also in terms of what they think is interesting. So there'll never be a way of educating that is perfect for all of them. [T2/25 2008]*

Because of this diversity, George thought that the students would view their study of the module ADDE in different ways, depending upon the Biological Science subject

they are studying. Therefore, the students' sense of aliveness could be gained in different ways:

*I think that it will be the case that Zoology students are going to think it is an animal behaviour course and the other students will think that it is a course in science or science techniques generally. [T1/22/2006]*

Alan, who was studying Biology, felt constrained when creating his experiment and this is expressed further in his comments that he wanted to conduct an experiment in an area of Biology in which he wants to specialise. Therefore, animal behaviour was 'not me' and thus, not personally meaningful to him, or useful for his 'self-fashioning' (Phillips, 1988a: 86):

*I didn't know what experiment we would be doing. I thought, well maybe we'd be doing things that we want to specialise in, in the future. I didn't really have much idea. I thought maybe we'd be looking at you know, development of the fruit fly [drosophila] and looking at the microbiology of them. But then I realised that we were doing the behaviour of drosophila and I just slumped further down, you know [...] I wasn't best pleased. [T1/32 2006]*

He went on in his first letter to a friend:

*I find the actual experiment somewhat uninspiring [...Particularly] the heavy bias toward animal behaviour. I appreciate the transferable nature of the module and how the skills acquired can be equally applied to general experimental design. But I would have much preferred it if these same core skills were employed in experiments geared toward our desired subject specialism (e.g. genetics, microbiology) simultaneously*

*gaining valuable laboratory experience in the necessary field.* [L1P4 2006]

Therefore, as indicated by George above, although Alan realises that the module teaches science and scientific skills, his lack of interest in the experimental animal (fruit fly) contributed to his boredom and a feeling of compliance with the course demands. Alan said:

*Oh god, it was boring. Yes we were looking at frequency in mating behaviours in drosophila, fruit flies. In class we got given a sheet of the mating behaviours which had been well established, and stuff and different orders of courtship like licking and tapping. It was the most mundane thing ever in Biology.* [T2/25 2006]

Angela also expressed a lack of interest in the experiment and a feeling of compliance. Like Alan, she indicates that she was not identifying herself as an animal behaviourist; rather as a geneticist, so again, the subject was not personally meaningful to her:

*Well I didn't like it because it was observation. I didn't really know that at the time. I didn't really enjoy this [the experimentation] and I knew that at the time. But then working, like running gels and manipulating DNA [part of her third- year genetics degree course] I prefer doing that, so I find that more exciting. I want to hear the result of my gel, I want to see what the sequence is - but with that, I couldn't care less how many aggressive encounters there is, as it were, because it doesn't mean anything to me [...]* There was no point to it and it was very tedious. [V2/57 2007]

Again, these findings connect well to Winnicott's (1950a) second stage of learning as noted in Chapter 3, in which an individual will find the 'bits' (Phillips, 1988a: 86). While developing what Rowland (2005) has called 'intellectual love' (p.96) with a

different subject specialism, such as genetics or microbiology, Alan and Angela are choosing what they can use for their 'self-fashioning' (*op.cit.*: 86). However, as Angela states below, this lack of interest can act as a 'barrier' as opposed to a driving force to move transition forward. Mann's (2001) ideas spring to mind in which she argues that students may feel alienated from academic tasks if they are unable to experience and work from their own desire and creativity. As has been stated by Barnett (2007) being 'hooked' (p.74) on one's field is important for new energies to be created and for the will to learn to grow. Angela said:

*The problem is, for a project you want it to be something that you are interested in and I understand that they can't always pick something that you are interested in, but if you don't have that incentive, then that is a barrier. [V3/28 2007]*

However, as argued by Eigen (1992), Winnicott's false self and the associated feeling of compliance, has 'at least two horns: toughness and compliance' (p.282). Eigen goes on to write '[t]oughness makes one feel alive ... the positive side of toughness is the *I can*, the *I will*, of healthy self-reliance' (p.283) (original emphasis). It will be shown in the following empirical chapters that Alan and Angela were both able show their toughness and resilience to overcome what were seen as barriers, by demonstrating that they were able to gain a sense of aliveness in different ways. It would seem that their desire to play creatively and design a successful experiment acted as a way to will them forward. Angela said:

*I hope to be successful in producing a decent lab. report and a decent presentation and drawing some conclusions from it. Basically, from walking in on that lab. on the first day and thinking, 'What on earth do these things [crickets] do?' To being able to*

*produce an experiment that produces results in a valid way. That is what I hope.* [T1/57 2006]

Alan wrote in his first letter to a friend:

*The most interesting part of this module will be seeing the outcome of my group's design. I like the idea of conducting the experiment, making the necessary analysis then receiving feedback on the quality of our analysis and finding out if we chose the right kind of statistics i.e. building something from scratch and then seeing if it stays 'upright'!* [L1P4 2006]

Therefore, Alan and Angela were able to gain a sense of aliveness through the science and scientific techniques delivered by the module, as commented on by George.

However all students did not report the positive experiences gained by playing creatively within transitional space, as reported above. Below I discuss the experiences of Wendy and Ben (*Group C*).

## **2. Cases of Compliance**

I observed Wendy (*Group C*) who was studying Human Genetics working diligently on her experiment within her group. As noted in the previous section, she was stuck when creating her experiment and reported a lack of self-confidence. When asked about this further, she stated her sense of boredom, as opposed to the feeling of aliveness associated with transitional space:

*Wendy: Boring –very boring!*

*Helen: So you are not enthusiastic about it?*

*Wendy: It is not interesting.* [T1/43 2006]

*Wendy: Actually, doing the experiment was okay. Yeah, I like that. But I don't like designing the experiments and doing all those statistics. But, I like doing the experiment, yeah.* [T1/45 2006]

Wendy commented upon her dislike of statistics and it will be shown in Chapter 9 that she also experienced difficulties with knowledge within the disciplinary boundary between Biology and Maths. This suggests that a lack of interest and sense of difficulty and challenge caused Wendy problems in creating and engaging with transitional space, again highlighting the potential nature of this space.

Ben, (*Group C*), who seemed to experience destructive friction within the laboratory, also indicated that he did not feel a sense of aliveness. His lack of interest in the experimental animal (fruit fly) appears to have resulted in a sense of compliance suggesting that this hindered him when designing his experiment. As Winnicott (1971) said, 'Compliance carries with it a sense of futility for the individual and is associated with the idea that nothing matters' (p.87):

*I thought like, well we have got the worst one [experimental animal]. So I thought, 'Whatever!' We were quite lost and we realised that we had to do it and we were, we really couldn't be bothered with it. It was our sort of state of mind, 'Whatever will do', cos we have got the worst one. So we don't really know what we'll do.* [V1/29 2007]

It is clear therefore, that when creating their experiments in the laboratory the six students, who were previously reported as having experienced either congruence or constructive friction within the laboratory (Nicky, Ryan in *Group A*, and Alan, Angela,

Kate and Matthew in *Group B*), demonstrated a sense of aliveness. This concurs with Winnicott's (1971) proposal that a feeling of aliveness is associated with positive experiences within transitional space. In particular, Ryan showed a sense of authentic true self and Matthew and Nicky expressed that their experimentation felt 'real'. Kate also demonstrated that transitional space is a place where individuals may surprise themselves, acting in a way that is unexpected. Yet, Alan and Angela, who had both engaged with their experimental design, showed a lack of interest in the field of animal behaviour. Thus, they did not develop an intellectual love (Rowland, 2005) for this subject. However, they were able to gain a sense of aliveness in other ways, overcoming this obstacle through their resilience and inner will to learn. In contrast Ben and Wendy (*Group C*), who were stuck when creating their experiments, conveyed a sense of boredom and compliance, indicating that the transition to become independent, creative Biological Science students had not taken place, resulting in a feeling of a false self.

#### **7.4 Conclusion**

In this chapter I have given an account of the students' experiences at the start of their study of the module ADDE when faced with the transition to becoming more independent and creative within the laboratory. By drawing upon Winnicott's theory of transitional space and play, I have begun to address the research questions by illuminating the students' different reactions and have demonstrated how their 'inner' capacities to play developed and the 'outer' holding environment hindered or facilitated their engagement in transitional space. In addition, I have considered whether the students saw their experimentation as 'me' where they might gain a sense of aliveness by playing creatively. It will be considered further within the following empirical



chapters if the students' 'inner' sense of aliveness hindered or facilitated their transitions.

I now begin to construct a profile of the students' transitional journeys and I continue to build upon this throughout the empirical chapters. A brief overview of each student is provided, in alphabetical order. I also include, within brackets, group A, B or C which correspond to the students' different experiences of transition.

### **The students' transitional journeys: Building individual profiles**

**Alan** (B /aliveness) showed an initial hindrance when starting the creation of the experimental design because of a sense of restriction. He also appeared to have a lack of aliveness for experimentation in the field of animal behaviour. But he did reveal an inner toughness (Eigen, 1992), showing his inner will to create and conduct a successful experiment.

**Angela** (B /aliveness) experienced the freedom to create an experiment as a 'shock' in which she demonstrated a sense of separation. Yet, she was able to move to engagement by playing with course materials and experimental objects, creatively discovering how to design an experiment. Similar to Alan above, Angela shows an inner will to learn despite not having a sense of aliveness for experimenting with animals.

**Ben** (C /compliance) demonstrated difficulty engaging in experimental academic play and was stuck. His difficulty appears to have been due to a feeling of separation from prior first-year laboratory teaching and a need for instruction and dependence. Ben also

showed a sense of compliance for the experimentation, as opposed to the aliveness that playing creatively can bring.

**Kate** (B /aliveness) initially showed a sense of separation when invited to engage in experimental academic play. Although a source of worry, she was confident and determined to move forward. Kate initially thought that experimentation was ‘not me’ but she shows a feeling of surprise, gaining a sense of aliveness for the creation of an experiment.

**Matthew** (B/aliveness) demonstrated his ability to quickly engage in experimental academic play, despite sensing an initial feeling of separation. He shows how he moved to play by easily putting himself into relation with the ‘outer’ teaching and learning environmental provision where he was able to start to creatively discover how to design an experiment. Through his engagement in creative play he shows a sense of aliveness for his experimentation.

**Nicky** (A/aliveness) showed confidence in her capacity for experimental academic play where she indicated it was ‘me’ accompanied by a sense of aliveness. The provision of the ‘outer’ holding environment therefore, seems to have been good enough and congruent to her learning.

**Ryan** (A/aliveness) showed self-confidence in his experimental academic play, even though it presented a challenge. He showed that playing creatively is ‘me’ accompanied by a sense of aliveness for experimentation in animal behaviour.

**Wendy** (*C/compliance*) had a lack of confidence in creating an experimental design and a sense of separation when invited to engage in experimental academic play. She indicates a need for instruction and the help of her group members. Wendy appears to have a sense of compliance for the animal experimentation, as opposed to a feeling of aliveness that comes from creative play.

Chapter 8 moves on to examine further transitions within the laboratory by exploring two other ways that the students were invited to engage in academic play during their study within the laboratory that is, working with others and giving oral presentations.

## **Chapter 8**

### **Communicative academic play within the laboratory: Becoming a creative group member and scientific presenter**

This chapter examines two potential academic play spaces within the laboratory; working with others within groups and oral presentations. In Chapter 6 I established that previously the students had only worked on their own or in pairs, as opposed to larger groups within the laboratory and had little or no experience of presenting orally while at university. Drawing upon Winnicott's (1963a, 1971) ideas about communication as outlined in Chapter 3, I argue that the module Analysing Data and Designing Experiments (ADDE) laboratory classes provides a social environment giving students the potential to learn in relation to others in overlapping transitional space through communicative academic play.

The chapter is divided into two sections. I start by considering the students' experiences of working with others in groups before examining their experiences when presenting orally in their groups.

#### **Analysis**

The empirical data within this chapter is drawn from semi-structured interviews, video-sessions, documentation and text including 'letters to a friend' and non-participant observation. As in the previous chapter, I have used the theoretical frame and the corresponding thematic codes as outlined in Chapter 4 'Research design' to conduct within and between case analysis (Miles and Huberman, 1994). As noted

above, I have additionally drawn upon Winnicott's (1963a, 1971) ideas about communication and in addition I have found the contemporary work on student voice by Denise Batchelor generative, outlined below.

### **Student voice**

Batchelor (2008) argues that having and expressing a voice involves 'creativity and self-expression, the profession of self and the injection of what one is into the outside world' (p.41) -voice therefore being integral to the identity formation of an individual. Batchelor (*ibid.*) also suggested that the concept of student voice is composed of three elements. Firstly, an epistemological voice consisting of two voices, that is, a voice for knowing and a practical voice, which are both related to asking 'What do I know?' (p.47). Therefore, the epistemological voice is related to a student's intellectual formation. The third voice, an ontological voice, involves a voice for being and becoming. It is the ontological voice that asks 'Who am I?' and is related to the student's formation of 'being' (p.47). Both ontological and epistemological voices are closely interrelated and support the development of each other. Batchelor's idea of student voice therefore, resonates with Winnicott's intermediate communication, as they both involve elements of inner self and the outer world. Hence, I suggest that the notion of student voice provides a useful heuristic to discern students' communicative, academic play within transitional space.

Barnett (2007) has recently stated that 'Higher Education does much to suppress voice' (p.94) and Batchelor (2006; 2008) has argued that the opportunity in HE to develop an ontological voice remains overlooked, and that the emphasis is more

upon the strengthening of voices for knowing and doing, as opposed to integrating voices for being and knowing. That said, Batchelor (2006) suggests that voice might be retrieved through processes involving uncovering, recovering and discovering. These ideas are useful to my thinking because they indicate a potentiality of voice to engage in communicative academic play in transitional space. Turning to the three processes, uncovering voice suggests that a voice had difficulty in being heard. It had perhaps remained covered by different factors, including for example, other voices. Recovered voice implies that a voice did exist, but it was thwarted for some reason, perhaps by a dogmatic environment, or by the individual, who fears to express his or her voice. Discovering a voice indicates the existence of a new and different voice that was already there, waiting to be revealed. Finally, Batchelor (2008) suggests that in order for these potential voices to be developed and strengthened, students must be provided with favourable circumstances. For example, she argues that students should be presented with different forms of 'space' (*ibid.*:52) that include not only physical and curricular spaces but also spaces, such as tutorial provision, for expressing and hearing voices for being and becoming; an ontological space for self exploration. This therefore, is congruent with Winnicott's (1971) emphasis upon the provision of a good enough, facilitative environment, in which an individual has the potential to engage in creative play within transitional space and discover self.

Drawing upon these analytical themes, I have aimed to illuminate how student voice consists of potential, ontological and epistemological voices that might integrate, support and strengthen each other. Within this chapter I focus upon an epistemological voice that concerns matters around, 'What do I know about the creation of the experimental design?' and 'How will it be conducted?' Alternatively,

the ontological voice is related to ‘Who am I?’ and involves: ‘Am I a creative experimental Biological Scientist?’, ‘Am I a group member?’ and ‘Am I a scientific presenter?’ I propose that through good enough environmental provision, students might create transitional space where communicative academic play takes place. During the students’ study within the laboratory, transitional space might be opened up into overlapping spaces between students and also, students and staff, where individuals can mutually play together thus bringing inner self into relation with the outer world. Verbal communication therefore, is a transitional phenomenon that is part of the facilitative environmental provision. It serves as a bridge between the inner familiar and the outer disturbingly unfamiliar (Winnicott, 1951), thus holding students during their transitions and aiding their personal growth.

The students’ experiences within their groups in the laboratory are now discussed.

### **8.1 Students’ experiences of communicative academic play within groups**

In the previous chapter I reported that the students’ initial experiences within the laboratory involved a move away from being instructed on how to do experimental work, towards creating an experiment within their groups. I likened this transition to a move towards becoming an independent, creative, experimental Biological Scientist. It was noted that this transition was initially experienced in different ways and it was shown that the students required different levels of holding to help them through their difficulties. Moving on, I demonstrate through the empirical data below that verbal communication, as suggested by Winnicott (1963b), acted as a transitional phenomenon providing the students with the holding environment they seemed to require. I also show that verbal epistemological and ontological play

helped the students to cope with their difficulties, and in turn increased their capacity for academic play, both verbally and creatively within the laboratory. This is illustrated through reference to the students' accounts that show the movement away from depending upon the instructions of teaching staff towards becoming independent creators of knowledge within their groups. Therefore, as a result of communicative academic play, the students began to gain 'control over a limited area' (Winnicott, 1989:60) and a sense of 'personal empowerment' (Creme and Hunt, 2002:159).

In Table 8.1 overleaf, the ways in which the students experienced this transition are outlined. Again, I draw upon the ideas of Vermunt and Verloop (1999) to describe their different experiences, as detailed in Chapter 7. Within the table I remind the reader of the students' initial experiences within the laboratory by including information about the students' previous experiences as reported in Chapter 7. I have achieved this by showing which group they were in previously: A 'smooth', B 'hindered' or C 'stuck' giving an indication of the characteristics of their personal transitions. This begins to build a profile of the learners' transitional journeys reported in this thesis and I will continue to provide additions to this throughout the empirical chapters. A table outlining all the students' transitions can be located in Appendix 2.



**Table 8.1**

<b>Names of students and profile</b>	<b>Experience of Transition</b>
<b>Angela*</b> (B) shocked, inner will to learn, aliveness for science <b>Kate*</b> (B) surprised, alive, inner will to learn, open to change <b>Nicky*</b> (A) alive, self-confident, open to change <b>Matthew</b> (B) alive, willing to engage <b>Ryan</b> (A) alive, creative, self-confident	<b>Smooth / Congruence</b> ( <i>Group A</i> )
<b>Alan**</b> (B) creative, restricted, aliveness for science, <b>Ben**</b> (C) compliant, little aliveness, liminal <b>Wendy</b> (C) compliant, little aliveness, lack of confidence, liminal	<b>Hindered / Constructive friction</b> ( <i>Group B</i> )

Students working together in two different groups within the laboratory:

\*Angela, Kate and Nicky    \*\* Alan and Ben

**The students' profiles and experiences of communicative academic play when  
working within groups**

*Group A* includes Angela, Kate, Nicky, Matthew and Ryan who show that working with others was experienced as smooth because they were capable of creating and playing within mutual overlapping transitional spaces, and uncovering and developing strong, confident voices. Moving to *Group B*, Ben and Alan were hindered in different ways in engaging in mutual, communicative academic play and this seemed to present them with a challenge. However, this experience appears to have been constructive because they show that by uncovering and strengthening their voices they were able to cope with the difficulties they encountered when creating their experiment and to become independent of staff instruction.

Finally, Wendy who was previously stuck and unable to create transitional space, did not initially engage in communicative play. Because of her lack of confidence, her voice remained covered, as she complied with a more dominant voice within her group. Despite this she later shows a move towards engagement.

The students' experiences are detailed below, starting with *Group B* including Wendy, Ben and Alan who show that they were hindered from engaging in academic communicative play.

### **1. Group B: Cases of becoming a leader and being led**

*Group B* illustrates how: the student cases created their own rules within their groups; Wendy preferred to be led by a group member; Alan became a leader; and Ben who worked in the same group initially needed the strong holding provided by Alan. This helped him to engage with the experimental design and develop a more confident voice.

Beginning with Wendy, I noted in Chapter 5 that Wendy's first language is Cantonese, though she considered herself to be a fluent speaker of English. It was reported in Chapter 7 that Wendy desired a high level of holding because she was stuck when creating her experiment and experienced a sense of separation and 'disjunction' (Savin-Baden 2000: 57) when staff did not provide her with instructions. Moreover, Wendy did not feel confident when designing her experiment and indicated that she would need the help of her group members. As Winnicott (1971) suggested 'the potential space happens only in relation to a feeling of confidence' (p.135) and Wendy appeared to hold back from taking part in mutual play and making her own contributions. Instead she relied upon a group member who took a leading role, to create an experimental design, and to provide the knowledge she required:

*[Names the group member] decided. [He] did a lot of reading and his ideas just like suddenly 'come up'. So [name of group member] just told us his ideas and we all went for it. [T2/15 2006]*

Therefore, as opposed to engaging directly with her difficulty to become a creative Biological Scientist within her group, Wendy coped by avoiding it (Savin-Baden: 2006; 2008a; 2008b) and finding a means to bypass it. As stated by Winnicott (1971) when writing about psychotherapy, 'The patient's creativity can be only too easily stolen by a therapist who knows too much' (p.76). Like a maternal impingement, the therapist who does not refrain from advertising what he knows may cause failure of play and the patient either complies with what is said, or rejects the psychoanalytical set up. Here, it is proposed that Wendy's potential to uncover her epistemological and ontological voices when creating an experimental design was initially unrealised due to her dependence and compliance upon a group leader. Yet, following assurance from George, the Course Convenor, after her groups' oral presentations within the laboratory in week 2<sup>4</sup> I show that Wendy did begin to move to uncover her voice and take part in epistemological communicative play.

I now examine Ben's transition. He was reported in Chapter 7 as being stuck when engaging with the creation of an experiment and required a strong, supportive, holding environment.

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<sup>4</sup> See table 6.1 for module timetable

## **A facilitative holding environment**

Group members provided the holding environment Ben needed to breach his initial sense of separation and disjunction when designing an experiment. It will be shown that this facilitated Ben's capacity to play, both verbally and creatively within the laboratory. As Ben said:

*I really liked the group work because it helped us overcome our problems. It would have been a lot harder if you had been on your own. [T2/32 2006]*

Winnicott (1971) emphasised that the ability to play can be fostered by a feeling of trust and confidence and Ben indicates that students within other groups helped to provide this. Tapper (1999) notes that the laboratory presents a public, social environment where students are able openly to view peers' work. I observed Ben talking to other students also experimenting with fruit flies, and asking them about their experimental designs. It is through verbal play with these students that Ben seems to have put himself into relation with others who also did not know what they were doing, so providing a sense of reassurance:

*It does sort of reassures you that you are not the only one that is finding it really hard to design the experiment. I mean I talked to [a member of another group] out of labs and I walked home with [him] and said, 'What on earth are we going to do?' Obviously he had no idea - he was just going to lob a few flies in and watch them. No one knew what to do with the flies - the group behind us didn't and the ones opposite weren't that sure [...] everyone was just bewildered really; no one knew what we were doing. [V1/27 2007]*

As well as reassuring and holding Ben, communicative play also helped him to gain a sense of aliveness when creating the experimental design, which he was reported to lack within the previous chapter. When commenting upon video data<sup>5</sup> it would seem that pleasurable verbal communication involving humour, aided Ben to stay engaged with the experiment. As noted by Winnicott (1970) when writing about chores and work, creativity might be maintained by imaginative experiences, even in moments of boring and mechanical routine. Ben remarked:

*Generally I'm trying to create an interesting experience out of a mind-numbingly boring experience and I just had to make it interesting otherwise we would have got so bored. [Names a group member] and me had a good laugh. [...]Because otherwise everything would just become stagnant and it is nice to have a bit of socialising. [V1/21 2007]*

Communicative play also facilitated Alan and Ben to make connections between their inner knowledge and their experimental design.

### **Moving away from preliminary chaos through communicative play**

Earlier I reported that Wendy coped with her difficulties when designing an experiment by avoiding them and by being led and that Ben did the same, leaving Alan to take the lead in designing his group's experiment. However, it will be shown later that as with Wendy the first oral presentations within the laboratory (during week 2<sup>6</sup>) provided an academic communicative play space for Ben where he put himself into relation with Alan's knowledge and ideas about the experimental design.

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<sup>5</sup> For further details, see the data collection timetable in Chapter 4

<sup>6</sup> See Table 6.1 p129 for module timetable

Consequently, Ben uncovered a more confident epistemological voice in which he knows about the conduct of the experiment and in so doing, strengthened his ontological voice, becoming an engaged group member. Below it is shown that Ben's increased capacity for communicative play within his group signified movement away from depending upon instructions from teaching staff that he initially required:

*[I]f you are stuck with what you are doing as a group you can talk and decide where to move - to actually move to improve it and ways to get out of a situation you are in. For example, if something isn't happening then the whole group can decide to move in a different direction and I think you make decisions faster than having to wait for George, or someone to come. You think well, there are four of us here and we can't find any flaws in our plan, so let's go on and do this. [T2 /41 2006]*

Ben's comments illustrate that epistemological communicative play acted as a transitional phenomenon (Winnicott, 1951; Phillips, 1988b) helping his group to overcome their problems. This is illustrated further in the empirical data concerning the problems Ben and Alan (*Group B*) experienced as a result of the open-endedness of the experimental design and confirms the Course Convenor George's comments in Chapter 7, who stated that when students have to think of ideas for themselves they might face uncertainty and feel that they have to 'blunder' their way through the difficulty. In other words, the students might be presented with an 'epistemological risk' (Barnett, 2007:143). As shown below, Alan stated that although his group had experimented with different ideas they did not know what they were doing, showing

the 'preliminary chaos' (Milner, 1978:37) that Winnicott saw as the first phase of creativity:

*This one [laboratory session in week 6] was the hardest 'cos we still didn't know what we were doing. We had to define some direction, where we were going. [V3/28 2007]*

Alan was shown within the video data to have a strong epistemological and ontological voice as a group leader, involving for example, talking to group members about how the experiment should be conducted and answering their questions. Alan's leading role is discussed in more detail below. But firstly, Alan was previously reported in Chapter 7 as experiencing a hindrance, sensing a restriction upon his creativity. As noted in Ben's comments below, it seems that Alan put himself into relation with his experimental design to create a 'flamboyant' experiment, but his group ran into difficulties because it did not have a precise focus. When faced with this problem, the video data shows that Alan amended the experimental design, telling another group member about it before voicing it to the group as a whole. His revised design involved narrowing the focus of the experiment. In the excerpt below, Ben illustrates that by engaging in communicative play his group was able to move away from preliminary chaos (Milner, 1978) towards finding the bits (Phillips, 1988a) they needed to create their experiment:

*It started becoming ridiculous. We started to be losing complete track of where we were going. we had just been trying to cover too many bases. So then once we had talked about it I think we all realised that we needed to focus on something. Alan is like one of those sort of people who wanted to cover everything and get like - we*

*wouldn't have got enough results. He wanted to study this and that and everything like a really fancy experiment, like his flamboyant self. Whereas we just couldn't do it, so we decided, we had to rein him in and say, 'We can't do all this!' So from what we had presented in the first weeks, he [Alan] changed our experiment because we just couldn't do all this, we just didn't have the time.* [V1/30 2007]

Ben's comments above and also below, suggest that whilst he was initially held and led by Alan, he gained confidence to engage in communicative play that was authentic to his inner self, showing his growing capacity to be critical (Barnett, 1997). Therefore, he was not necessarily compliant with Alan's ideas:

*I would have been critical if it hadn't made sense, but it was a good idea [the focus of the experimental design] so obviously we were willing to accept it [...] so we ran with it. But if it had of been [sic] wrong I would have said, 'No Alan'.* [V1/49 2007]

Although Alan had taken a leading role within his group, he also had a need to be held through his difficulties. Below, Alan indicates a call for putting himself into relation with the knowledge of others. Yet, it would appear that he viewed his group as failing to take part in the mutual, epistemological communicative play he required. As a leader he shows a sense of being detached from his group members. Therefore, it seems that verbal communication within his group did not provide Alan with the good enough, facilitative environment he needs:

*I enjoy working in groups, but not in that group [...] Yeah they didn't come up with anything [or] say, 'Why don't you do this, or that?' And [that] was really a kind of challenge.* [T2/12/2006]



*I would have liked it if they had the expertise to contribute a bit more of their own ideas, possibly extending on what turned out to be quite a small experiment. [L2P2 2006]*

Thus, as reported in Chapter 7, Alan still seems to feel a restriction upon his capacity for academic play, reflective of Ben's account of the group 'reining' him in. However, by taking a leading role, Alan did increase his capacity to play as a group member in other ways.

Below I discuss Alan's experiences of moving to take a leading role.

### **Becoming a group leader**

I reported above that Alan took a leading role within his group, discovering a strong voice amongst his group members. Play within transitional space can involve individuals changing and taking on different roles (Creme and Hunt, 2002) and it appears that this new, leading role represented a transition for Alan that is 'not me'. Although play within transitional space is not necessarily the 'consequence of a pre-determined fit between what the learner brings and the object of study' (Creme, 2008:52-53) rather, it may be a space where an individual might surprise him / herself (Winnicott, 1950a). Alan wrote in his first letter to a friend:

*I'm always the stupid one in practicals for crying out loud, so found it weird having all of them [group members] asking ME what we should do! [L1P2 2006] (original emphasis)*

When asked in his second interview how he viewed himself within his group, Alan added:

*Oh, I don't know, like the 'bringer together' the 'blu- tack', yeah I'd like to think that I helped bring the group together. I mean it is not what I officially wanted. I'm not a control freak or anything; I'm never like that. Like I said in the letter to a friend, I'm always the one that leaves it to other people. [T2/52 2006]*

As stated earlier, play facilitates both the capacity for playing and personal growth (Winnicott, 1971,1989; Phillips, 1988b) and this new role has resulted in a change in attitude for Alan whereby he has developed a personal learner quality (Barnett, 2007) expressing empathy for his group members (Braille and Johnson, 2008). This corresponds in some ways to Winnicott's (1963c) writing about the development of the capacity for concern, where concern is referred to as ' the fact that the individual *cares*, or *minds*, and both feels and accepts responsibility' (p.73) (original emphasis). In addition, by taking responsibility through which he discovered a leading epistemological and ontological voice, Alan was aware that he had to strongly hold group members and this seems to have resulted in a move towards greater confidence and independence as a learner:

*They needed me. What can I say? They probably wouldn't have survived. [V3/17 2007]*

*It was just me doing everything. I mean no offence to my group members or anything they are fantastic guys. But when it came to this module [ADDE], I would have rather have done it on my own. I just carried them. [T2/8 2006]*

Therefore, both Ben and Alan's (*Group B*) transitions within the laboratory were not linear and smooth, rather they involved preliminary chaos that caused difficulty and revised direction. However, despite initial hindrances, communicative play for Ben acted as a transitional phenomenon facilitating him to uncover a more confident epistemological voice in which he knows how to conduct the experiment, and a stronger ontological voice, becoming a more engaged experimenter and group member. Overall Ben has an increased sense of aliveness, moving away from relying upon instructions from staff, towards independence. However, whilst communicative play seems to have provided a good enough facilitative environment for Ben, Alan required greater holding by his group members, expressing both a need for mutual communicative academic play, and a sense of restriction. Yet, by taking a leading role that is 'not me', Alan surprised himself, discovering a strong epistemological and ontological voice within his group, facilitating greater learner independence and a sense of responsibility for others.

In contrast to the experiences outlined thus far, *Group A* which included Angela, Kate Nicky, Matthew and Ryan, all reported smoother transitions in which they appeared capable of engaging in mutual academic communicative play.

## **2. Group A: Cases of mutual communicative academic play**

*Group A* involves firstly, Matthew and Ryan and secondly, Angela, Kate and Nicky who worked together as a group in the laboratory. All these students demonstrate that opening up and engaging in mutual, overlapping communicative academic play facilitated the creation of their experimental design and their move to become independent, creative Biological Scientists with confident voices.

## Pushing the experimental design forward

It was shown above that Alan took a lead role within his group. However Angela and Kate who were shown previously to initially experience hindrances when designing an experiment and Nicky who had reported a smooth transition, all indicated that their group participated in mutual play, as opposed to having one leading voice. As Nicky said:

*[A]ll our ideas came together, so there was no leader. I mean everyone began suggesting things and it was quite nice really, it was good you know? No one took over even though there were maybe people that were stronger in a certain area; they maybe led in particular areas. But there wasn't a designated leader that everyone was following. [T2/17 2006]*

Angela, Kate and Nicky's smoother transitions appear to have been further enabled by meeting informally, outside class to discuss their experimental design and engage in epistemological verbal play. Here it would seem that they were able to create overlapping transitional spaces to play with their ideas and learn in relation to each other. In Chapter 7, I highlighted that these students found 'control over a limited area' (Winnicott, 1989:60) and by having greater independence and freedom to play with their experimental design they now know what they are doing, in contrast to their previous experiences within the laboratory in which they were instructed what to do. This indicates that these students' moved to Winnicott's (1950a) second stage of learning during the creation of their experiment whereby they were 'enabled to have the power to see more and more clearly what you are doing and why.' (p.14):

*Nicky: Yeah we did actually do that [spend time outside classes planning the experiment]*

*Kate: We were ace, weren't we?*

*Nicky: We were.*

*Kate: Compared to the rest of the class like we sort of went along and we knew what we were doing because we had met up outside of labs. Whereas other people got to the actual date of the practical [conducting the experiments in week 6 and 7], talked about it and then did it. So I think that really helped. [V2/53 2007]*

The comments above show that these students viewed their group as being ahead with the design of their experiment in comparison to other students. Previously I highlighted Kate and Angela's 'inner' will to learn. Kate indicates that she and Angela moved the group forward:

*I think I've been a lot more organised and have been a bit of a driving force along with Angela to get it done. [T3/26 2007]*

Both Kate and Angela talked about their need to push themselves forward, suggesting that by working within a group they have also developed personal dispositions such as an inner 'will' to learn and also a 'determination to keep going forward' (Barnett, 2007:102). As stated by Creme (2008) connections might be forged in transitional space through 'an ability and willingness to play seriously and sustainedly' (p.53). Firstly, Angela who also worked part-time said that she had to organise her academic work accordingly to stay ahead:

*[I'm] maybe a bit pushy, I like to get things done and when I've got a deadline I want to get it done because I'm busy. I mean I know that everyone is busy but when I've got the time to do it I want to get on with it [...] therefore I'll push myself to get it done and then I can move on to something else. So in that sense I suppose I was forward.* [T2/64 2006]

As reported in Chapter 5, Kate had fallen behind in her AS level studies due to medical reasons. Therefore it would seem that this experience was constructive (Vermunt and Verloop, 1999) resulting in her becoming more organised and willing to push herself forward:

*I tend to push myself a bit harder because I don't like being behind.* [T2/ 35 2006]

*I don't think I've ever been as organised for a module [ADDE] in my life.* [T2/ 23 2006]

The students also showed that because they played verbally both inside and outside the laboratory and pushed their experimental design forward they moved to become more independent of instructions by teaching staff, becoming creative discoverers of knowledge, as opposed to being compliant consumers. As Kate said:

*I think that we were pretty self-sufficient because we'd designed it [the experiment] so far in advance. So we knew exactly what we were doing and so when we were actually in labs it wasn't that hard.* [T2/29 2006]

Turning to Matthew and Ryan who worked within different groups, Matthew's group also appeared to take part in mutual, epistemological verbal play, with no dominant leader:

*It is fairly shared [the work and talk within the group] I talk quite a lot. I've been quite assertive. So other members of the group may well say I talk a lot [...] overall it has been a good balance so far. [T2/20 2006]*

In addition, Matthew stated that one group member was a friend and they had regularly met informally to talk about their experiment, moving their design forward.

Ryan's group also reported that there was no group leader. In ways similar to the accounts given by Angela, Nicky Kate and Matthew his group also appeared to push their experimental design forward by taking part in epistemological communicative play with his group members when meeting informally and also by text-messaging and as shown below, email:

*We've stayed in contact through email and talked about things that we could improve - if there were any other like ideas that popped up. And we all had the same lectures so when we saw each other we would just like talk about it [the experiment]. [T2/50 2006]*

As I have shown earlier, epistemological communicative play with group members enabled a move away from being dependent upon staff instructions, as Matthew said:

*Because if you don't understand something you can just ask someone and generally with there being much more people you could work it out between yourself which has been useful. [T2/19 2006]*

Ryan commented similarly:

*If I had any troubles I was able to ask them [group members] which is a big help I think and where I'm stuck someone else may not be, so that was good. [T2/40 2006]*

Therefore, Ryan and Matthew also illustrate that communicative play aided them to put inner self into relation with other group members' ideas and knowledge. Thus verbal communication acted as a transitional phenomenon, part of the holding environmental provision.

### **Mutual communicative academic play: A holding environment**

In Chapter 7 Kate had stated that the freedom provided by ADDE to seek out knowledge for herself had caused her worry, but communicative play with her group members provided the holding she needed, giving her trust and confidence that the experimental design was moving in the right direction. This highlights again that some students experienced the open-ended nature of the experimental design as uncertain. Kate said:

*I had the help of my three group people and they were really good as well, so I didn't feel like I'm on my own. And people could challenge what you think or what you said, or your suggestion and say, 'Well actually I think that is a good idea'. So I*



*don't think I trust my judgement enough. But when there are other people thinking the same thing you know that you are heading in the right direction. [T2/24 2006]*

Nicky's comments below also show that by uncovering and playing with various epistemological voices her group members were enabled to put themselves into relation with the different knowledge of others:

*You definitely learn and also, you can say the same things in a different way and it means different things. I can't think of any examples, but obviously four brains are better than one brain [...] and lots [members of the group] had remembered different things from first-year lectures and different things they had heard and different things that they had read and so we didn't all have to read the same thing. We all went away and read different things and brought more ideas back. So it was quite refreshing really to get different views and then there would be feedback. If you weren't working in a group you would have never have realised, never thought it was important. [T2 /20 2006]*

Angela commented similarly:

*My group was brilliant and everyone comes up with a different point that I wouldn't have thought about necessarily. [T2/28 2006]*

Within the video data it was observed that Angela, Kate and Nicky all engaged in verbal play involving humour during their experimentation within the laboratory. Previously in Chapter 7, Angela was reported as lacking a sense of aliveness when

studying animal behaviour. Yet, as shown by Ben, she also indicated that verbal play with her group helped her to cope and to maintain her engagement with the experiment:

*To be honest watching crickets for two hours isn't the most of exciting things and you needed that sort of relationship [verbal communication and humour between group members] to make it, I'm not saying enjoyable, but you know, making it bearable. [V3/6 2007]*

Matthew was reported earlier to have initially experienced constructive friction within the laboratory and further to this, he experienced difficulty when constructing a precise experimental hypothesis to address. Taylor (2006) has stated hypothesis creation as being 'troublesome' (p.95) or even representative of a 'threshold' that must be breached, as discussed in Chapters 2 and 3. But as indicated in his comments below through mutual epistemological communicative play, the members of Matthew's group were able to hold each other and direct the focus of their experiment:

*And just coming up with the experiment we all kind of – a couple of us came up with the main idea and then we were, 'Yeah, yeah, yeah - let's do this- let's do that' and with all the different minds, we could shape it into a more coherent question to answer. [T2/23 2006]*

Ryan also reported similarly and his comments below indicate that through communicative play his group were able to breach epistemological 'gaps':

*[I]t was more like filling in the 'gap' for each other that was the main thing.*

[T2/51/2006]

Overall therefore, uncovering and playing with different epistemological voices seems to have bridged the separation between inner self and the new and unfamiliar outer for these students, aiding the creation of their experiment. Moreover, their accounts suggest that their epistemological voices, concerning what they know about designing and conducting their experiment, supported the uncovering and strengthening of their ontological voices with regard to becoming an experimenter and a group member, as discussed below.

### **Becoming a group member**

I start with Angela, Kate and Nicky's group. Kate showed an increased sense of responsibility for her group members and this seems to have helped her to work harder to create and conduct the experiment:

*[W]orking in a group makes you work harder because you have a sense of responsibility. It is not just your own work that's at stake.* [T2/16/2006]

Angela also showed that by being 'pushy' within her group as reported earlier, she gained a sense of concern for her group members:

*I just hope it didn't just get to be a bit much you know? [Being pushy with other group members] A couple of times you go round to each others' houses and have a cup of tea and then you are like, 'Come on, let's do something now', you know?*

[T2/65 2006]

Although Nicky did not indicate that she had been a driving force, by playing creatively she seemed to also gain an increased concern for others:

*I was using my own ideas and it is good when you have done something that you have actually done yourself and benefited all the others in the group as well. [T2/60 2006]*

The comments above show a sense of becoming a responsible group member, who is developing a number of learner qualities and dispositions, increasing their capacity to play. Nicky's comment below illustrates further that she is open to change, sensing that movement to become a group or 'team' member who has a voice within a laboratory is 'me':

*I've definitely learnt that I can work within a team. You know you think of a scientist in a lab being a solitary individual working in a lab in silence. So I've changed my mind I think. [T2/ 56 2006]*

In Chapter 5, I noted that during her gap year Angela reported working within a professional laboratory. Here it would seem that she had suppressed her voice, allowing it to be covered by more authoritarian voices. However, within the ADDE laboratory, where she now knows what she is doing, Angela's epistemological voice appears to have supported the uncovering of a stronger, more confident ontological voice in which she is no longer an 'underdog':

*I always felt like the underdog [during the gap year]. So I was always aware that those more experienced than me knew what they were doing. So I always felt slightly*

*subdued by them I suppose. Whereas in this situation it has really worked backwards I suppose, because I have said and done a lot in the lab. [T1/12 2006]*

Angela's previous suppressed voice looks to have been additionally strengthened by creating overlapping verbal spaces with Kate, who was also studying Genetics. Angela and Kate developed a close friendship during their study of ADDE, in which they became playmates, engaging in mutual verbal play that is 'me'. One of the special qualities of play is that adults and '[c]hildren make friends and enemies during play, while they do not easily make friends apart from play' (Winnicott, 1991:145). So through verbal play Kate and Angela were able to gain the confidence to uncover authentic ontological voices and this resulted in the shared sense of 'aliveness' (Winnicott, 1971:58) and passion for their discipline being revealed. Angela said:

*I didn't really meet many people last year who are as passionate about it [studying Genetics] as I am and because of that you kind of hide the fact that you like your degree. And I know that she [Kate] does too. So it is quite - it is very refreshing to talk to someone about something that you like without people thinking that you are sounding like an idiot. [T2/47 2006]*

Previously it was reported that Alan (*Group B*) seemed to sense a restriction upon his capacity to play verbally with his group members. In contrast, it is shown that Angela and Kate appeared to be able to play easily together within mutual overlapping space in which they were keen to play 'seriously and sustainedly' (Creme, 2008:53) and also, critically, forging connections by learning in relation to each other's ideas and knowledge:

*Kate was really brilliant to work with. I didn't really work with anyone last year [in the first-year] who I could really bounce off in that way and she was as keen as I was and she helped me a lot in the sense that I could question what I was doing and she'd question what she was doing and we could talk about it between us and we were on the same wavelength. That made it really helpful just like saying something out loud and she would say, 'Well wait, that doesn't quite make sense.'* [T2/52 2006]

Barnett (2007) has proposed that inspirational teaching is important because it helps students to will their learning forward, yet Kate's comment below shows that putting self into relation with a peer can have a similar influence:

*[M]eeting Angela and the way that she works was quite, she's quite inspirational and so that pushed me on; someone that I can work with and make it sort of fun and I think that's just sort of changed my outlook on the second-year.* [T4/28/ 2007]

Angela was further enabled to develop her ontological voice as a group member by 'active listening' which involves 'a sense in which you are who listens to you' (Batchelor, 2008:49) and this resonates with Winnicott's (1963b) idea of silent, personal communication, discussed in Chapter 3. Thus, this form of communication appears to have acted as a bridge, helping Angela to increase her capacity to play by becoming open to new possibilities and the views of others. As Winnicott (1951) proposed, it is through accepting difference and similarity that we grow. Angela commented:

*And listening as well is something that you have to take on board, which sounds silly and quite arrogant. But I'm quite prone to thinking, well I think it should be done like this and then someone will say something different and you have to hear it – not just listen – and let it go in. [T2/41 2006]*

Ryan also indicated that he strengthened his ontological voice as a group member within the laboratory and he also appears to have enabled this through silent, personal communication (Winnicott, 1963b):

*Group-wise it really helped me out with communicating things and how important it is to communicate. It occurred to me when I was talking to a group member, how if I didn't express myself well then it could lead on to some kind of misunderstanding. And it is also about - by misunderstanding it can lead to trouble between the group members and that kind of thing can be very risky. So I think clarifying your opinions and ideas is something that is very important. So before giving out my ideas I would process and then look over it and then talk about it. [T2/25 2006]*

Ryan's comments suggest that through mutual verbal play he has developed a concern for his group members, as shown by Alan, Angela, Kate and Nicky. Below, he is respectful to the views of others:

*I think being flexible as well because we don't always think in the same way so sometimes you have two different opinions. So you have to communicate that, clarify your opinion and then agree on something and find certain bases where the people agree. And the agreement doesn't necessarily have to be the same opinion, but it can*

*be just respecting the other person's opinion. So that is what I have learnt.* [T2/32 2006]

Matthew also indicated that silent communicative play had enabled him to develop his ontological voice where he shows a move towards having a clearer voice (Barnett, 2007), becoming a group member who has an increased capacity to play verbally with others:

*It [working within a group] made you think about it more and made you a better communicator in what you are thinking, getting it across to other people.* [T2/26 2006]

In general, the students within *Group A* show an increase in their capacity to play in transitional space uncovering and strengthening their epistemological and ontological voices.

In summary, *Group A* appears to have easily engaged in mutual epistemological verbal play both formally within the laboratory and also, informally outside class. This involved the uncovering and recovering of their epistemological voices, enabling them to plan and organise their experimental design, pushing it forward. It would appear that through communicative play these students were able to create a good enough holding environment for themselves where they moved towards becoming independent creators of knowledge within their group. In addition, like Alan (*Group B*) these students showed that through verbal play they developed learner qualities and dispositions, showing a growing sense of responsibility for others, as well as being open to change. Further, by engaging in mutual



communicative play the students were able to strengthen their ontological voices as experimenters and group members. Finally, Angela and Kate seemed to show a determination to will themselves forward, playing well together within overlapping transitional space, making a firm friendship and thus, forging connections through epistemological and ontological verbal play. This friendship remained strong and it is shown within Chapters 9 and 10 that their mutual communicative play aided further transitions.

In conclusion, the empirical data shows that the module ADDE invited students to engage in communicative academic play within their groups. Overall, epistemological verbal play seems to have acted as a transitional phenomenon, providing a bridge between the knowledge of inner self and the unfamiliar outer experimental design allowing students to learn in relation to the knowledge and perspectives of others, helping them to cope with their difficulties and facilitating their capacity to play creatively within the laboratory. Winnicott (1989) theorised that play results in gaining 'control over a limited area' (p.60). Similarly, through communicative play Ben and Alan (*Group B*) and Kate, Angela, Nicky, Ryan and Matthew (*Group A*) provided evidence that they were able to move away from being a knowledge consumer, dependent upon staff instructions towards becoming independent knowledge creators within their groups. *Group A* shows that this appears to have been a result of mutual verbal play in overlapping spaces where students enhanced and strengthened their voices. Additionally, verbal play between group members seems to have facilitated the development of further personal qualities and dispositions that increase their capacity to play. This includes a will and determination to move the experimental design forward, being open to change, a

preparedness to listen and also a growing concern and responsibility for others. In terms of *Group B* Alan led his group and had the confidence to create an experimental design, independent from staff instructions whereas Ben initially needed to be led by Alan, before he was able to engage with the experimental design and become more independent as a group member.

I have also shown that the transition to work with others within groups was experienced in different ways and the students' required different levels of holding. Overall the students in *Group A*, Angela, Kate, Nicky, Matthew and Ryan seemed to be more capable to take part in mutual communicative play. As a result, these students all showed a move towards becoming group members with confident voices. In contrast *Group B* when faced with epistemological and ontological risks (Barnett, 2007:143) experienced more difficult transitions in which their communicative play was not mutual, rather it involved leaders with strong voices and students being led. Wendy seemed initially unable to uncover her voice because she seemed stuck in her learning and lacked confidence, relying upon a more dominant voice within her group to provide the knowledge she required. Therefore Wendy still appears to experience 'disjunction' (Savin-Baden, 2000, 2008a, 2008b) in which she has bypassed difficulty and engagement within transitional space. Alan surprised himself by leading his group, showing a strong voice. But he indicated that he needed the holding that could be provided by mutual communicative academic play. Alan's strong voice seems to have given Ben, who was initially compliant, the good enough holding he required.

Batchelor (2008) has proposed that epistemological and ontological voices can integrate and strengthen each other and it would seem that overall, the students have played with both voices, gauging the robustness of their ontological voice according to the strength of their epistemological voice. This is illustrated further within the following section, where I examine how the students experienced the transition to become scientific presenters within the laboratory. Here, their capacity to play within transitional space is discerned in their ontological and epistemological voices when they speak, or do not speak, in front of their peers and the Course Convenor, George.

## **8.2 Students' experiences of communicative play when presenting orally within the laboratory**

This Section focuses upon the students' transitional experiences when presenting within the laboratory during Week 2<sup>7</sup> of the module Analysing Data and Designing Experiments (ADDE). I consider the second, more formal oral presentations within Chapters 9 and 10 in which I examine how the second presentations acted as a potential transitional phenomenon to facilitate the students' analysis of their quantitative data and writing of their scientific report.

I propose that the oral presentations invited the students to bring together and make connections between their experimental design and oral presentation. Here, they express what they know and who they are within their epistemological and ontological voices, respectively.

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<sup>7</sup> See Table 6.1 p.129 for the module timetable.

In Chapter 6 the module ADDE was discussed and a brief outline about how the oral presentations were conducted was provided. I begin with a brief overview, before turning to the students' experiences.

### **The oral presentations within the laboratory: An overview**

The oral presentations within the laboratory were informal and were conducted at the end of the laboratory session during week 2. The presentations were very brief, lasting approximately 3 minutes per group, and because time was limited the students were told that not all group members would be able to speak, so most groups had only two students to talk on their behalf.<sup>8</sup> The students were advised to present an outline of their experimental design plus a graph or chart to illustrate their preliminary results. The students created visual aids on acetates and they were provided with an overhead projector (OHP) to show them to the class. After each presentation George provided some formative feedback (see Sadler, 1989). Non-participant observation identified that the students were not given feedback on their presentation skills, the comments being focused instead on the content of the presentations. These included guidance about the presentation of tables and graphs, possible statistical tests to analyse the data and advice about the wording of hypothesis / hypotheses. This type of feedback therefore, is characteristic of 'divergent' formative assessment that aims to discover what the student 'knows, understands or can do' (Torrance and Prior, 2004:146) and is orientated towards further development, as opposed to measuring achievement. Hence, this feedback corresponds with Winnicott's (1971) ideas discussed in Chapter 3 about conversation

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<sup>8</sup> The students were informed of this following the first presentation in the laboratory when all the group members spoke. This group included students taking part in this study namely, Angela, Kate and Nicky.

as psychoanalysis, where through communicative play the individual is enabled to further creatively discover for him, or herself.

I now discuss the students' transitions.

Table 8.2 below illustrates the students' different experiences of transition when presenting within the laboratory. I provide the students' prior transitional profiles within this table, as explained at the start of this chapter.

**Table 8.2**

<b>Names of Students</b>	<b>Experience of Transition</b>
Kate* (BA), Matthew (BA)	<b>Congruence / Smooth</b> <i>Group A</i>
Alan (BB) ** Angela (BA) * Ben CB)** Nicky (AA)* and Ryan (AA)	<b>Hindered / Constructive friction</b> <i>Group B</i>
Wendy (CB)	<b>Stuck / Destructive friction</b> <i>Group C</i>

Students working together within two different groups in the laboratory:

\* Angela, Kate and Nicky

\*\* Alan and Ben

**The students' experiences of communicative academic play when presenting orally within the laboratory**

I start with the experiences of Wendy (*Group C*) who chose to retreat from presenting and did not speak. I then move to *Group B* including Alan, Angela, Ben, Nicky and Ryan who reveal a number of hindrances before and whilst, engaging with their presentation. This group also incorporates the experiences of Ben who did not

speak in the first presentations, but went on to talk on behalf of his group in the second, more formal presentations. Finally I report the smoother experiences of both Kate and Matthew (*Group A*).

### **1. Group C: An unconfident voice: Avoiding engagement**

Wendy stated that she regularly contributed to discussions during tutorials where the classes were smaller, yet she described presentations as being more ‘serious’ and indicated that taking part was ‘not me’, showing a sense of self-consciousness. Corresponding with Wendy’s transitional experiences already reported, a lack of confidence in her voice seems to have resulted in her bypassing (Savin-Baden, 2000; 2008a) the opportunity to speak. As emphasised by Winnicott (1971; 1989) a lack of confidence can diminish an individual’s capacity to play in transitional space:

*I don’t like presentations. I don’t like talking to many people [...] I’m afraid that I will say the wrong thing and I always talk too fast when I do presentations. [T1/51 2006]*

As I explained in Chapter 6, ADDE provided students with the freedom to make mistakes. But Wendy is self-conscious and worried that she will say the ‘wrong thing’ in front of the class. However, whilst Wendy did not speak, she did indicate that she began to learn in relation to others. Firstly her class members:

*They were so confident and the way they speak was really good. I think they gave good explanations. Yes this is the problem; I need to learn from them. [T1/56 2006]*

Secondly, Wendy was aided by the formative feedback provided by George, the Course Convenor. As I have shown earlier, a number of students experienced uncertainty when designing their experiments, and communicative academic play within their groups seemed to hold them through their difficulties, helping them to cope. However, through verbal communication with George, Wendy who in Chapter 7 demonstrated a need to follow instructions from staff, seems to exhibit increased confidence and a move towards engaging in epistemological verbal play within her group. Hence, Wendy appears to have put herself into relation with the views of George and also her group members to discover how to play with the experimental design and further refine it:

*Wendy: Actually, after the presentation when George talked to us in the first weeks, we all talked and decided to change the base of the experiments 'cos in the first two weeks we [had] used quite a lot of colour boards, about six or seven, and there was quite a lot – too many. It was complicated.*

*Helen: So after the presentation and the feedback from George you changed it?*

*Wendy: Yeah, we made it even easier, more simple with four boards. [T2/23/2006]*

Even though Wendy did not uncover and strengthen her voice as a scientific presenter, nevertheless she learnt in relation to her peers' presentations and also to verbal communication with George. In particular, the formative feedback appears to have acted as a transitional phenomenon, facilitating Wendy's capacity to play as a group member who has a voice.

## 2. Group B: Hesitation and stuttering: Tentative voices

Turning to *Group B*, I start with Ben who also chose to avoid taking part in his groups' presentation and keep his voice covered. Ben's comments below seem to suggest that he chose not to speak in the first presentation because he was unprepared and so did not have a sense of confidence. As demonstrated in the previous section, Ben gauged the strength of his ontological voice according to the robustness of his epistemological voice. His comment below illustrates that he did not want to show his sense of preliminary chaos to an audience:

*But I just didn't know what to say 'cos we hadn't really found anything out; so it was a bit awkward [...] And so we basically we didn't have anything to present. We basically had - we'd done a bit of preliminary work but we haven't really found anything out and it looks awful if you stand up and say that. [T2/57 2006]*

I reported in Section 8.1 that Ben began to engage at a later stage with the experimental design, developing a stronger voice. This is because the first presentation appears to have invited Ben to put himself into relation to the knowledge of other group members. As he stated, at the start of the module the members of his group were at different levels of understanding:

*[T]here was really a lack of like unified understanding between us as well. It felt like. I'd say, I think at that stage [week 1 and 2] I would say that me and maybe [names a group member] were on one level and [another group member] and Alan were on another one. [T1/22 2006]*



Consequently, he seems to have willed his learning forward by engaging with the creation of his group's experiment, putting himself into relation with Alan's knowledge and ideas:

*Ben: You have to get involved a lot more, otherwise you will not have a clue what is going on.*

*Helen: So you talked to Alan after the presentation?*

*Ben: Yeah, I spoke to him and he had an acetate that he read out and I also read that afterwards and then it brings everyone up to speed in the group as to where other people think they are going as well. [T1/23 2006]*

By strengthening his voice as a group member, Ben was able to increase his capacity to play as a scientific presenter, speaking on behalf of his group in the second, more formal presentations.

### **Hindered by self-consciousness**

As stated above, Alan (*Group B*) and another group member were at a higher level of understanding within their group and both spoke in the first presentation, suggesting that their epistemological voices aided them to develop confident ontological voices. Alan, as a member of a Drama group at university, suggests that he had developed his ontological voice as a public speaker, through performing regularly in front of an audience. Yet similarly to Wendy, Alan showed that presenting was 'not me' and demonstrated a lack of confidence. It was talking in front of class members that seemed to provide a disturbingly different 'outer' for Alan:

*I know it sounds horrible. If it was more of a geeky group [class] I'd feel more in place. I feel out of place cos I'm a geek secretly, it's weird. [T2/29 2006]*

*I was just scared of the group [class]. [T4/47 2007]*

Therefore, Alan shows a need to keep his true self (Winnicott,1960b) hidden from other students and this caused him some anxiety:

*I wasn't listening [to the other presentations] because I was too worried about ours. [T2/12 2006]*

Presenting provides an open display of work to the audience (Hounsell and McCune, 2003) and Alan's self-consciousness is evident in his concerns about making a mistake in front of the class:

*It is mostly a bit like a circus isn't it? You just want to see if everyone mucks up, if they do something funny like trip up, or trip over. That's why I hate going up and doing it myself because I know that is what the others are thinking. You know they want to see something really stupid. I think that is the essence of it really and I think that was the same in the second presentation that's what I think everyone secretly cares about. [T2/19 2006]*

Wendy (Group C) received facilitative feedback from George about her group's experiment which she used to creatively discover, but Alan appeared self-conscious about mistakes being highlighted in front of an audience. Therefore, while ADDE

provided ‘contained chaos’ (Milner, 1971) in which students can freely make mistakes, Alan does not want to show this to an audience:

*I don't know what graph we came up with, but it didn't even have scales on it and the axes weren't labelled and George lovingly pointed that out to everybody. [T2/18 2006]*

Therefore, although Alan spoke in the first presentation he shows that it was ‘not me’, indicating a sense of self-consciousness when putting himself into relation with a radically different ‘outer’. It would seem that Alan’s strong epistemological voice had enabled him to play, but due to his anxieties he chose not to speak in the second, more formal presentations. However, Alan did comment that he would have spoken if the audience was small, consisting of just staff members, suggesting that this would have provided a good enough holding environment for him to speak confidently within. Hence, Alan’s lack of confidence appears to have diminished his capacity to play (Winnicott, 1971). This further highlights the potentiality of transitional space, where an individual might change over time in terms of what he or she is confident in learning and how and where it is learnt.

### **Pushing to engage in play**

Moving to Angela and Nicky also in *Group B*, who worked in the laboratory with Kate (*Group A*). They were the first students to present and unlike the other groups, every member of the group spoke<sup>9</sup>. Whilst the class had been informed the previous week that they would be required to undertake a short presentation, Nicky still

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<sup>9</sup> This is because George instructed the class after this first presentation that there was not enough time for every student to speak.

seemed unprepared. Below she shows how she needs her epistemological and ontological voice to support and strengthen each other:

*We were out on the 'spot'. We weren't given much warning you know? I don't know how I sounded. I planned what I was going to say, but I don't what I came across like. We had to do it in a rush, but I definitely now know how to plan things [experiments] by saying them. I have to know things. [T2/15 2006]*

Yet, while Nicky spoke within her group, she indicated that she also viewed presenting as a radically different 'outer' which is 'not me' and where she needed to gain further confidence:

*It was really nerve racking and I know it wasn't a very big group [class], but you could see that some people just wouldn't do it [present]. [T2/49 2006]*

*I mean I don't like speaking to groups [of people], but it is something that you need to do. So you have to get over it, so. [T2/42 2006]*

But Nicky showed later that her lack of confidence did not hinder her capacity to play and she stated that she had wanted to speak in the second presentation where she was observed answering a question posed by George.

In contrast, Angela seemed to see presenting as being 'me' because she had previously studied Drama at A-level and also, undertaken a formal presentation during her gap year where she had worked within a professional laboratory. However like Nicky, she stated a feeling of not being ready to undertake the talk, suggesting

that although she had a strong ontological voice, her epistemological voice was still tentative:

*I remember thinking I don't know what I think about these crickets - I hadn't done any background reading. I didn't know what they did or how they behaved, you know? As a standard I didn't know if what we were seeing was remotely relevant. It [the first presentations] all seemed a bit basic and a bit rushed. [T2/27 2006]*

Previously in Chapter 7 I showed that Angela initially experienced constructive friction within the laboratory where she reported experiencing difficulties designing the experiment at the start of the module. This is 'preliminary chaos' evident in Angela's comments, above and also below, where she appears to have played with her voices by gauging the strength of her ontological voice against the robustness of her epistemological voice:

*I didn't like talking about something that I don't understand and I was thinking if he [George] questions me on this I'm not going to have a clue, I haven't had a chance to think about this. [T2/30 2006]*

It was pointed out earlier that George provided formative feedback to the students and this facilitated Wendy's (*Group C*) capacity to play as a group member with a voice. It would seem that this verbal communication also acted as a transitional phenomenon for Angela, because she was prompted to put herself into relation with her prior experiences. This appears to have aided the forging of connections, moving her towards becoming a creative Biological Scientist within the laboratory:

*I mean the one thing that was wrong with ours [presentation] was that we didn't do aims and hypothesis or anything like that - we didn't even put a hypothesis in and that hit me and I was just like, great yeah, try to just start to think a little more scientifically now than GCSE 'I predict that'. So I suppose that was the take home message in the second week it was trying to get you back into the fact that you are acting like a scientist - you have to think like a scientist. It brought all the stuff back from the module we did last year - it brought all that stuff back and I thought, I remember now, that is how I have to think about it. [T1/34 2006]*

Hence, communicative play provided by the presentations has aided Angela's personal growth (Winnicott, 1971; 1989) and this is shown further in her comments below where she indicates that the oral presentations also helped her to keep persistently driving the experimental design forward:

*It gave a very clear indication of the time scale we were working under. Like if we had to have something by then [the second week], then we were going to have something quite a bit more in quite a short space of time. So it sort of kicked me into action I suppose. [T1/37 2006]*

Therefore the presentations also provided a holding environment for Angela, as shown by Ryan, below.

### **Facilitating transition**

Turning to Ryan also in *Group B*, he had previously taken part in oral presentations as part of his International Baccalaureate (IB) study. However, he said that he would

like to have more opportunities to make presentations, suggesting that he was aware that he would have to play persistently in order to gain a stronger voice. In particular, Ryan suggested that tutorials would provide a supportive environment to develop a more confident voice, though the laboratory setting appears to have facilitated Ryan's engagement with the talk:

*I think it [the laboratory] gave a good atmosphere to speak. It allowed you to concentrate on what you were talking about. [T2/54 2006]*

Similar to other students' reports within *Group B* Ryan also indicated that his epistemological voice was tentative at this stage of his study:

*It [the experiment] was difficult to talk about because we didn't quite have clear values in trends yet. So we couldn't really show that what we were doing was significant. [T2/40 2006]*

Ryan also showed that the oral presentations had enabled him to play further and make connections with the experimental design:

*I think it was important [the presentation] because we could go over what we had done so far and then by presenting it [the experimental design], clarify ourselves (sic.) Because we had to go over what we had done so far and also put it in a format that people will understand and I think that was really helpful. [T2/49 2006]*

Following the presentation and also after receiving formative feedback from George, Ryan commented that his group reviewed their experimental design. It would appear that George's verbal communication acted as a transitional phenomenon, part of the facilitative environment, aiding his personal growth as a creative Biological Scientist.

Overall the students in *Group B* show that they experienced various difficulties and anxieties when engaging with their presentations within the laboratory, where they indicated a need to further increase their capacity to play and make connections between their epistemological and ontological voices in order to become confident scientific presenters. The empirical data shows that the oral presentations and George's verbal communication acted as transitional phenomenon for Angela and Ryan, enabling them to facilitate their capacity to play as creative Biological Scientists.

To conclude, I examine the smoother experiences of *Group A* that includes both Matthew and Kate. These students' transitions were considered to be experienced as smooth because they did not report any anxieties when presenting, or any difficulties that hindered them from speaking.

### **3. Group A: Cases of confident voices**

Starting with Matthew, he did not view himself as a good public speaker, suggesting that he saw presenting as 'not me'. However, he was observed to talk clearly and confidently in front of the class. It would appear that his strong epistemological voice had supported the development of his ontological voice:



*I'm not a very good speaker [...] But in terms of the practical, I've helped it along quite well, we know what we are doing. We did a little presentation at the end of last week [week 2] and I spoke and helped co-ordinate that. [T1/35 2006]*

Similarly to Angela's comments above, the presentations also helped Matthew to will himself forward, remaining engaged with the design of his experiment. As suggested by Creme (2008) connections may be forged in transitional space through an 'ability and willingness to play seriously and sustainedly' (p.53):

*It [the presentation] made yourself make sure you knew what was exactly going on and so you never kind of just relaxed and thought oh, I'll just do it towards the end of term when I write it up. You kind of knew that you had to do it. [T2/24 2006]*

Whilst the presentations provided anxiety and a feeling of a lack of confidence for some students, they appear to have provided a good enough holding environment for Matthew. Below he indicates that by putting himself into relation with other groups' presentations he gained a sense of re-assurance:

*It was helpful to see how everyone had laid it out and just get the structure as much as anything and you could see that everyone was doing a similar structure and you could think okay that is how we have done ours as well, that is obviously how it is done. So it was reassuring in that sense and you could see the layout in how it went from hypothesis to prediction and doing results and getting conclusion and discussion and stuff, so that was good. [T1/40 2006]*

Moving on to Kate. I noted previously that Angela and Nicky (*Group B*) who worked alongside Kate within the laboratory still had tentative epistemological voices during the first presentations. However, it would seem that this did not cause anxiety for Kate who had gained experience of presenting during her tutorials at University and considered herself as an experienced public speaker. I also observed Kate to be at ease speaking in front of the class. Becoming a scientific presenter therefore appears to be ‘me’, in which she is confident to play:

*I don't really get nervous doing this kind of thing cos I used to do Drama and I used to do lots of public speaking. It is something that doesn't bother me that much, so I thought, I know that I can do it with confidence.* [T1/ 53 2006]

Hence Kate's prior experiences of public speaking seem to have provided a bridge, aiding her ‘continuity of being’ (Winnitcott, 1950b: 28) and a smooth transition. In addition, the presentation seems to have facilitated her capacity for academic play where she appears to have moved further towards becoming a creative Biological Scientist by putting herself into relation to the writing up of the experiment. As noted by Wyatt-Brown (1993) oral presentations can be used as a rehearsal for writing:

*We didn't think to put a null hypothesis in because we were still thinking very much in the labs and not thinking about writing it up and so on [...] I think it [the presentation] made it a lot clearer in our heads. We had to think about it in the way - we now have to think about it for doing it for our project. It [the presentation] is that kind of intermediate between the actual hands on [experimentation] and the writing up of it.* [T2/17 2006]

In Chapter 10, I examine how the second presentations acted as a transitional phenomenon, facilitating the students' writing of their scientific reports.

Therefore, neither Matthew nor Kate reported any difficulties or anxieties when talking in front of the class. Their smoother transitions seem to have been facilitated by their confident epistemological and ontological voices. Additionally, the presentations appear to have aided their capacity to play further as creative Biological Scientists.

To summarise, the students were provided with the opportunity to create an open display of their experimental designs and present them to an audience within the laboratory. Overall, I have shown that the transition to become a scientific presenter was experienced in different ways, in which the potential nature of transitional space has been highlighted. This is illustrated in the students' accounts that demonstrate how a lack of confidence can diminish an individual's capacity to play within transitional space. For example, Wendy (*Group C*) and Ben (*Group B*) did not have confident voices and chose to retreat from speaking in the presentations. In addition, I noted that Nicky, Angela and Ryan (*Group B*) had tentative epistemological voices at this stage of their study, indicating that they needed to play further with their experimental designs in order to strengthen and make connections between their epistemological and ontological voices. Moreover, although Alan had a strong epistemological voice he lacked confidence in his ontological voice, expressing a sense of self-consciousness when displaying his work. This seemed to hinder him from taking part in the second, more formal presentation. For the students in *Group B* and *C* therefore, the presentations presented epistemological and ontological risks

(Barnett, 2007). In contrast, both Matthew and Kate seem to have experienced smooth transitions because they appeared able to play confidently with their voices.

As noted by Winnicott (1963b) communicative play can lead to personal growth and the presentations appear to have not only provided the students with the opportunity to uncover and strengthen their voices, but also facilitate the students' capacities to play. To illustrate, Wendy (*Group C*) seemed to strengthen her epistemological voice, shifting to engage as a group member and Ryan and Angela (*Group B*) indicated that they were enabled to increase their capacity to play as creative Biological Scientists, moving to discover ways in which they could further refine their experimental design.

### **8.3 Conclusion**

In conclusion, this chapter has discussed the students' experiences of communicative play within the laboratory. Barnett (2007) has suggested that Higher Education does much to suppress students' voices and that there is a concentration upon the development of epistemological voices, as opposed to ontological voices (Batchelor, 2006). But the module ADDE appears to provide students with a potential academic play space, inviting the students to engage in communicative play within transitional space where connections could be forged between ontological and epistemological voices. In addition, verbal communication seems to have acted as a transitional phenomenon, facilitating their transitions and increasing their capacity to play in different ways.

In terms of addressing the research questions, I have clustered the different ways the students reacted when faced with the transitions to become a group member and scientific presenter. I have highlighted that communicative play aided students cope with their difficulties designing an experiment. I identified that students' 'inner' capacities such as a will to engage and push forward, facilitated students' transitions. In addition, I noted that a lack of confidence in both their epistemological and ontological voices as well as a sense of self-consciousness, hindered transition. I have also reported how communicative play acted as a part of the holding environment, facilitating personal growth such as the capacity for concern and more confident ontological and epistemological voices. Finally I have reported how students required different levels of holding and that for some students the provision was not perceived as 'good enough.'

I complete the chapter by providing a summary of the experiences of individual students in alphabetical order. I continue to include the different experiences that the students have been reported to experience in brackets, building a profile of their transitional journeys.

### **The students' transitional journeys: Building individual profiles**

**Alan** (BBB) experienced constructive friction when working with others and presenting orally. He developed a strong voice as group leader, a role that surprised him, aiding his growth of independence, confidence and concern for others. However, he still sensed a restriction upon his capacity to play and seemed to need holding through mutual communicative academic play by his group members. He

spoke confidently in the first presentations, although his comments reveal a tentative ontological voice and a self-consciousness when speaking in front of the class.

**Angela (BAB)** had a smooth transition when moving to work with others. She was capable of taking part in mutual communicative play developing a strong voice, responsibility for others and a determination and will to push forward, aided by her growing friendship with Kate. Her experience of presenting orally shows hesitation and a tentative epistemological voice. But the experience seems to have facilitated her to push herself to continue to creatively discover and move her experimental design forward.

**Ben (CBB)** was initially hindered from engaging in communicative play within his group and did not speak in the first presentations showing a lack of confidence in his epistemological voice. However the sense of being behind helped him, to put self into relation with the ideas of Alan, who was leading the group, and to will himself to engage, developing a stronger voice within his group and further increasing his capacity to play as a scientific presenter, when he spoke on behalf of his group during the second phase of presentations.

**Kate (BAA)** was capable of taking part in mutual communicative play in her group. She developed her determination to push forward, becoming a more organised learner who has responsibility for her group members. She spoke with a strong voice during the oral presentations and also talked on behalf of her group in the second presentations. Her transitions seem to have been aided by her friendship with Angela

where they created overlapping communicative play spaces, willing each other forward.

**Nicky** (AAB) also experienced a smooth transition to work in her group. She seemed to develop a sense of becoming a 'team' player instead her voice became stronger through mutual communicative academic play. She also showed a sense of concern for her group members. Although she had a tentative ontological voice when presenting orally, she pushed herself forward showing a growing confidence and openness to change.

**Matthew** (BAA) was capable of taking part in mutual communicative play within his group and this helped him to cope with difficulty, moving the experimental design forward and developing his capacity to play as a group member. He also appeared to develop a strong voice as a scientific presenter, in which role he talked confidently.

**Ryan** (AAB) experienced a smooth transition to work within his group engaging in mutual communicative play with his group members. He showed a move to become a listener who is respectful of their views and opinions. Ryan indicated that the laboratory provided a good enough holding environment where he felt safe to engage in his groups presentation.

**Wendy** (CBC) was initially hindered from taking part in verbal play and appeared to keep her voice covered, due to her lack of confidence in her epistemological voice, letting a more dominant group member design the experiment. However, while she was not confident enough to take part in the presentation she shows a move to

engage with the experimental design. With reassurance being provided by George the Course Convenor, it resulted in her shifting to engage in mutual play within her group.

In the following Chapter I move away from the laboratory environment and report upon the students' transitions at a disciplinary boundary between Biological Science and Mathematics, in which they analysed their quantitative data.



## Chapter 9

### **Analytical academic play: Becoming a creative data analyst**

In this chapter I examine the students' experiences of analysing the quantitative data they collected during the conduct of their experiments. Previously, in the first-year the students had been told which statistical tests to use when analysing their data. In contrast, the module Analysing Data and Designing Experiments (ADDE) invites the students to move away from compliance and dependence and to take part in analytical academic play, where they have the freedom to decide how to analyse their data, and to integrate this into their experimental design. By exploring the students' capacities to play I propose that analytical academic play is discerned in the ways that they engage with different statistical concepts, find and use different ideas and knowledge and forge connections between two domains: their quantitative data analysis and the experiments they have created in their groups.

I begin by outlining the students' initial reactions to studying statistical concepts. I show that the mathematical component of the module ADDE caused all the students to express a sense of separation and 'unintegration' (Winnicott, 1960a: 44) because maths is seen as a radically different other which is 'not me' (Winnicott, 1960c: 17). I then discuss the students' experiences of analytical play in which I examine how they coped with their individual difficulties and the ways their transitions were facilitated or hindered.

## **The disciplinary boundary between the Biological Sciences and Maths**

In Chapter 2 I noted that the Biological Sciences are ‘unrestricted’ Pantin (1968:18). In other words, that the discipline has a large academic tribe and territory (Becher and Trowler, 2001), and is wide-ranging both within the discipline and at its boundaries with other disciplines (Taylor, 2006; 2008). This chapter explores the students’ transitions at the disciplinary boundary between the Biological Sciences and Mathematics.

I noted in Chapter 2 ‘Context of the study’ the concerns in the Biological Sciences about the mathematical abilities of undergraduate students. Tariq (2005) has reported that when Biological Science teaching staff were asked to write three words or phrases to describe their perceptions about students’ maths abilities, they provided responses that included ‘fearful’, ‘phobic’, ‘disengaged with numeracy’, ‘unwilling to try’ and ‘lacking confidence’ (p.1). Such concerns are not restricted to the Biological Sciences. For example, Stokes (2006) has highlighted a number of difficulties that students studying Geography, Earth and Environmental Sciences (GEES subjects) experience and has pointed out that many students studying maths that underlies a science subject, have problems. Stokes (*ibid.*) suggests that students’ difficulties could be due to their not liking numbers, or having ‘equation phobia’ (p.18) Therefore, students studying science disciplines might experience ontological difficulties when studying the maths component of their subject. I explore such difficulties within this chapter.

## Analysis

As in previous chapters I have analysed data gathered by all of the multiple data collection methods employed and have undertaken within and between case analysis using the key themes as outlined in Chapter 4 ‘Research design’. As in Chapter 8 I have continued to draw upon Winnicott’s (1963a, 1971) ideas about communication and the contemporary work on student voice by Batchelor (2006, 2008). This has helped me to illuminate how the students coped with their difficulties, by engaging in communicative academic play. In addition, I have used Meyer and Land’s (2003, 2005, 2006) notion of threshold concepts because the students’ understanding of statistical concepts are closely aligned to their ideas. In particular I have used the notion liminality and also Savin-Baden’s (2000; 2008a, 2008b) concept of disjunction to illuminate the students’ experiences of difficult transitions.

I now examine the students’ initial reactions to making the transition into the disciplinary boundary between Biology and Maths.

### 9.1 Transitions at a disciplinary boundary: A radically different ‘outer’

George, the Course Convenor stated that the greatest variation he observed amongst the students studying the module ADDE concerned the wide range of mathematical backgrounds:

*The major discrepancy for a course like this, or the major divergence amongst students on a course like this which I think is relevant in terms of how I teach it, is that it is a course on statistics. It has a quite a strong mathematical component and among biologists there is a tremendous variation from one student to another in their*

*sort of 'happiness' with doing mathematics and their experiences of mathematical approaches. So some of them for example, who have A-level mathematics, find the level of mathematics on this course quite straight forward [And there are] Others, particularly those who have chosen not to study A-level mathematics because they disliked the subject so much - and so it is always difficult to know how much mathematical knowledge to assume in them in them and you can bore some and easily confuse others. And that is always a danger I think but, I think more than a little, that we have in the second [year] module - that is the heterogeneity among the students that one has to be aware of. [T1/22 20006]*

Therefore, according to George, the students could have various levels of 'happiness' or sense of aliveness (Winnicott, 1971) when studying the maths component of the module. A point kept in mind within this chapter.

The students were asked about their difficulties when studying the module Analysing Data and Designing Experiments (ADDE). All reported the statistical component of the module as most challenging. Six students, including Angela, Kate, Nicky, Ryan, Matthew and Alan, had not studied maths beyond GCSE level and stated that their difficulties were connected to their previous experiences of studying maths. So students did not feel prepared to undertake this transition and their reports convey a sense of separation because their previous experiences represent a low level of continuity with their present experience. The statistics therefore appear to have presented these students with a radically different 'outer'. The comments of three students below are representative of the accounts given by six of the students.

Kate stated what she would find difficult:

*It is less of interpretation and more of the actual core maths and choosing the statistic [to analyse the data] and learning about the different errors and how to mend the errors in the statistics and the terminology - the things that people who have done A-level maths will know off by heart, but I have to go and look in a book and try and work it out. [T1/13 2006]*

Ryan said:

*Some people have been telling me that they have been doing maths and stats at A-level, whereas I didn't have any of that [the study of these subjects during the International Baccalaureate (IB)]. So I think that will be difficult for me. [T1/15 2006]*

Nicky stated:

*This is something that doesn't come naturally because I didn't do maths at A-level. I just don't have the background that other people have. [T3/19 2007]*

In addition these students demonstrate a sense of separation and lack of continuity. As discussed overleaf, all indicated that maths represents a radically different outer, which is 'not me'.

## Maths is 'not me'

Students might see knowledge 'alien', or 'foreign' (Perkins, 2006:39) and I propose that such knowledge can be located at a disciplinary boundary. In addition, McCormick (2008) has indicated that subjects at disciplinary boundaries might be seen as having a 'service function' (p.54) because the subject is not necessarily the main focus of the teaching and learning. Overleaf, George's comment suggests that the Biological Science students studying ADDE might have a similar view about statistics:

*There is a small minority of students who actually like the statistics because they just like the concepts behind the analysis and just love looking at statistics in a pure and theoretical kind of way. And those students are a small proportion and most students are much more interested in the issue of asking scientific questions and statistics are really a tool to get the most out of the data which they accumulate. And that's probably the way the vast majority of students doing statistics is [it's] something that you need to know about in order to do the things that you find interesting - but it is not that the statistics themselves are interesting. [T1/30 2006]*

George's quote above indicates that the learning of statistics by Biological Science students is driven by their 'inner' personal interest which connects to Winnicott's (1971) idea of a sense of 'aliveness' (p.76). His comments suggest that most students will gain a sense of aliveness from their interest in science when engaging with statistics. The alternative is a sense of compliance and it would appear that students might resent studying maths and perhaps view this subject as 'not me':

*There also is a phenomenon which is a general phenomenon in the world of science, in British science probably in particular which is that many people who go into the Biological Sciences chose to do [so] because they want to be a scientist, but they don't like the mathematics. And I think there is an undercurrent of them feeling that the deal that they made with the education system has now been reneged on when you go in and say, 'This is what a natural logarithm looks like'. So I think there is a feeling not just that they find mathematics difficult, but there is sometimes - and this is kind of rare, but I think it is kind of a significant minority - there is a feeling of resentment of, 'Why do we have to do maths? If I'd have wanted to do maths, I would have done physics, quite frankly.'* [T2/16 2008]

At the start of the study, all of the students, despite their prior experiences, indicated that they saw maths as being a radical other that is 'not me' to various extents. In their comments below, maths is mostly viewed as foreign and not seen as something that comes naturally because it is perceived as conceptually difficult (Perkins, 2006). The statistical analysis of their data therefore might present an 'other' in which they have to gain confidence in order to increase their capacity to play in transitional space.

As shown in Nicky's comment earlier, when studying maths the subject had not come naturally to her. Similarly, Ryan indicated that he sees maths as difficult. Such a view is reflected further in the students' comments below in which they also see themselves as not being good at maths. Alan said:

*I think I've always had it in my head that you know, this is really new to me and I'm not naturally good at statistics - maths stuff.* [T1/19 2006]

For Angela, statistics seem to represent ‘alien’ (Perkins, 2006:39) knowledge:

*I find statistics quite difficult and I need to really sit down and think about it. It is quite alien. We didn't do any statistics at GCSE [level] and p values and t values were chucked at me last year [during the first-year] which is just a language I didn't speak. I can get my head round it, but my mind doesn't naturally work like that, so it is a bit of a struggle. [T1/18 2006]*

Therefore, Angela appears to find statistics as presenting her with a struggle. Her difficulty is further compounded by her problem with mathematical language which she thinks she doesn't ‘speak’. Kate also indicated that she could not ‘think’ like a mathematician:

*I can think through experiments and I think I can think scientifically on a day-to-day basis. I can think quite logically about things, but just when it comes to statistics, it is not my forte really. [T2/15 2006]*

Similarly, Matthew's comments appear to show that maths is ‘not me’ because he can not ‘see’ mathematics clearly and hence, views himself as not good at maths:

*I've not that sort of brain [...] I spoke to a lot of people and it's the sort of brain they've got. Quite a specialism to have that sort of - where you can see it in your head, almost. [T2/40 2006]*



*I think a mathematician would say it was basic maths [the statistical concepts taught in the module ADDE]. But I don't find it particularly easy because I'm not a mathematician. In fact I'm really quite bad at maths. [T2 /29 2006]*

In addition Ben and Wendy, who had studied maths beyond GCSE level, also questioned whether maths is 'me'. Wendy had studied A-level maths, but whilst gaining an understanding of pure mathematics, she seemed to sense a lack of aliveness for statistics. This corresponds to Wendy's previous comments where she had a lack aliveness and confidence when creating the experiment:

*I've never liked statistics, I rather prefer pure maths. I'm not confident in the [statistical] tests because I always think that there are a lot of choices and mine will be the worst, maybe. [T1/4 2006]*

*[I'm hoping to learn] the statistic bit 'cos I'm not good at that. I think I'm not good at analysing the results. [T1/9 2006]*

Ben studied three sciences at A-level which had included an introductory course on statistics. Nevertheless, he still saw statistics as a source of worry:

*It is the stats that worry me. Probably because I'm not great with stats and sometimes I just feel like I am just completely lost. [T1/10 2006]*

The students' accounts above therefore, appear to show a feeling of maths and statistics as being difficult and possibly a source of struggle or worry. Their lack of confidence in their ability to do maths also indicates that their capacity to play might

be limited. Yet, these comments were made despite the students having previously studied a compulsory module in the first-year that provided an introduction to statistics and acted as a prerequisite module for the study of ADDE.

### **An introduction to statistics**

The introductory module in the first-year involved a number of lectures and computer workshops in which the student worked through a series of booklets. During the computer workshops the students were familiarised with software known as a 'Statistical Package for Social Scientists' (SPSS). By using this to analyse their data Kate and Matthew were the only students who exhibited a greater 'happiness', or aliveness for statistics after completing the course. Yet, overall the students' accounts indicate that their understanding of statistics had moved forward. In particular, they gained a better grasp of the chi-squared test and the t-test. In addition the students said that they had used the handouts provided in the introductory course to help them analyse their data during their study of ADDE. Therefore, the handouts acted as a transitional object (Winnicott, 1951) that went on being important to the individual by acting as a bridge between the familiar and the disturbing unfamiliar, thus easing the gap between the students' prior understandings of statistics and the new conceptual knowledge with which they need to engage and play.

However, as I noted above, students still showed a sense of discontinuity and uncertainty concerning their understanding and application of statistics and data analysis. This indicates that the students might need to be held strongly during this transition. Below, George appears to be instinctively aware that statistics might cause students anxiety and difficulty:

*If I had to summarise what I think students need to do in this course [ADDE] in particular is, as it were, to keep a steady nerve and realise that statistics can be done by everyone if you just look you know, if you just keep your eyes focused upon the important parts of it. And just keep your eyes upon the main questions about what it is that you are trying to do with statistics and I think anyone can do it. What they have to guard themselves against [is] just the dismissal of their own ability by saying 'I can't do all that mathematical and quantitative stuff it is all beyond me' and in fact if they keep their eyes on the 'prize' as it were and just keep focused on the important stuff then anyone can really do it. [T2/19 2008]*

Hence, students need to play seriously and persistently to overcome the possible ontological problems that might hinder their engagement with their data analysis. Yet, despite such difficulties, George hopes that on completion of the module, most students will gain the self-confidence to increase their capacity to play further:

*I think most of them; the typical student will go away with more self-confidence about their ability to do this [data analysis]. More a kind of feeling that it is not so scary after all. That is what I would hope that they get you know, that statistics isn't a closed book to be only done as a last resort. [T2/25 2008]*

In the section overleaf, I explain how George provided a holding environment for the students in order to ease their sense of separation and gain their confidence in analytical academic play.

## **Facilitating analytical play: A holding environment**

I reported in the two previous empirical chapters that the students worked together in groups in the laboratory. They also worked together to analyse the data they collected during their experiments and which they presented to the class in week 8 of the module. During these second oral presentations that lasted approximately eight minutes, only one group member spoke<sup>10</sup>, but all students were asked questions and given feedback about their experimental design and data analysis by George. These presentations therefore, provided the potential for overlapping communicative academic play spaces to be created, where students might be alerted to any refinements they could make to their data analysis thereby putting him / herself into relation with the knowledge and ideas of others. Consequently, the students were advised that when writing their individual scientific reports which I discuss in Chapter 10, they did not necessarily have to undertake the analysis that their group had done, rather they had the freedom to change and play further with different statistical concepts.

In Chapter 6<sup>11</sup> I highlighted that George said the module had been designed and ordered in a particular way, suggesting that the course had been ‘constructively aligned’ (Biggs, 2003:11) to aid the students’ understanding of data analysis and experimental design. In so doing, the module had been organised with the aim that the lectures delivered in weeks 3-5 would facilitate consideration by the students of the statistical concepts they could use in the analysis of their data before conducting their ‘mini-projects’ in weeks 6 and 7 of the module. In other words it would help the

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<sup>10</sup> Ben and Kate presented on behalf of their groups

<sup>11</sup> See Table 6.1 for the module timetable

students to see the collection and analysis of statistics as being an integral part of creating an experimental design:

*So what the second year really adds to the first-year [introductory] course is that element of experimental design and understanding the statistics at the beginning, rather than having the statistics being the thing you do after the experiment. And we have designed it [ADDE] with that in mind - so even though they spend two weeks looking at the animals and thinking about the questions that they might like to ask, we appreciate that anything they do in the first two weeks is going to be probably not very well designed statistically. And so the way that the course is designed is to have three weeks of me telling them about good experimental design and good statistics before they do their mini-project. It is very deliberate because what we want from them in week six of the mini-project is for them to understand the principles of experimental design. By that stage they will also know the organisms because they have seen them in the first two weeks and they bring those two things together and then they design their experiments which answer the questions that they want to do in a particular statistically rigorous way and that's the idea. [T1/20 2006]*

Therefore, the design of the module invites the students to create a transitional academic analytical play space where they have the potential to find and make connections between two different 'domains' (Creme, 2008:60) that is, the statistical concepts and the experimental design created by him / herself within their group. George's comments also suggest that the data analysis requires the understanding of a particular 'episteme' (Perkins, 2006), which is 'a system of ideas or way of

understanding that allows us to establish knowledge' (p.42). The episteme is elaborated upon below:

*[The] statistics should be at the beginning and not at the end and that is another fundamental idea that I try to get over, that you don't get the statistician when you have got the data set and everyone has gone home and you scratch your head and say, 'What does this all mean then?' The statistician should be in at the beginning, or not a statistician, but statistical inference or statistical ideas are in at the beginning as part of how you chose to determine what to do. [T1/12 2006]*

Students might have difficulties playing 'epistemic games' (Perkins, 2006:42) because they can be a form of tacit knowledge within a discipline. However, it appears that the module ADDE was been deliberately structured in a certain order so that the episteme is surfaced. Therefore, the students' analytical play also involves playing a game. As indicated by Winnicott (1989), one development in an individual's capacity to play involves the playing of games, with 'rules and regulations pre-arranged' (p.61).

The students' experiences are now examined.

## **Section 9.2 The students' experiences of analytical academic play**

In this section the students' experiences of analytical academic play are reported. I highlight that only one student, Matthew (*Group A*), experienced a smoother transition than his peers because he was able to put himself into relation with the ideas of teaching staff and quickly grasp how to analyse his data with little difficulty.

The remaining seven students' Ben, Nicky, Ryan and Wendy (*Group C*) and Angela, Alan and Kate (*Group B*) experienced various difficulties in which they were hindered and facilitated in different ways. All these students exhibit 'preliminary chaos', the first stage of the creative process that can involve 'phases of nonsense' and fruitless attempts before the 'fiery flashes of intuition' that follow (Milner, 1978:37), although there is variation within. For example, the students in *Group C* improved their understanding of statistical concepts, but still remained uncertain about their data analysis, showing a sense of being stuck. In contrast, *Group B* sought help from George and moved from chaos to creatively discovering how to analyse their data. Similar to my reports in the previous chapter, I show how the students coped with their difficulties by engaging in communicative academic play, putting self into relation with the knowledge and ideas of group members and the Course Convenor, George, by help-seeking (Newman, 1994; Clegg *et al.*, 2006).

In Table 9.1 overleaf, I outline the students' experiences of transition, detailed above. In so doing I have continued to: draw upon the ideas of Vermunt and Verloop (1999) by grouping the students into three different strands; and build a profile of the students' transitional journeys (as reported in Chapters 7 and 8) by providing an indication of the characteristics of their personal transitions.

**Table 9.1**

<b>Names of students and transitional journey profiles</b>	<b>Experience of Transition</b>
<b>Matthew</b> (BAA) confident, alive, will to engage, strong voice.	<b>Smooth / Congruence</b> ( <i>Group A</i> )
<b>Alan**</b> (BBB) restricted, aliveness for science, group leader, tentative ontological voice <b>Angela*</b> (BAB) shocked, inner will to learn, aliveness for science, pushy, tentative emerging epistemological voice <b>Kate*</b> (BAA) surprised, alive, inner will to learn, open to change, strong voice, determined	<b>Hindered / Constructive friction</b> ( <i>Group B</i> )
<b>Ben **</b> (CBB) compliant, little aliveness, liminal, will to engage, emerging confident voice, growing independence <b>Nicky*</b> (AAB) alive, self-confident, open to change, emerging confident voice, will to engage <b>Ryan</b> (AAB) alive, creative, self-confident, tentative epistemological voice, concerned, listener <b>Wendy</b> (CBC) compliant, little aliveness, lack of confidence, liminal emerging voice as group member	<b>Stuck / Destructive friction</b> ( <i>Group C</i> )

Students working together in two different groups within the laboratory: \*Angela, Kate and

Nicky \*\* Alan and Ben

### **The students' transitional profiles and experiences of analytical academic play**

Below I discuss the students' experiences starting with Matthew (*Group A*). I then move on to consider the more difficult transitions experienced by the students in *Group B* followed by *Group C*.

#### **1. Group A: Playing the 'epistemic game'**

Matthew (*Group A*) appeared to have a smoother transition in comparison to the other students. In Chapter 7 I reported that Matthew had the capacity to put himself into relation with the 'outer' laboratory teaching and learning environment and make the connections he needed to create an experiment within his group. Moving on, a key reason for Matthew's smooth transition seems to be because he was also able to



play the epistemic game as outlined by George earlier and therefore, was quick to incorporate statistical analysis into the creation of his experimental design. During the non-participation observation, I recorded that Matthew's group had some help from the PhD student who assisted the students with their laboratory work. This was simply because during two of the laboratory sessions, one of the group members was absent. Therefore, whilst being helped with the conduct of the experiment, the students within this group were presented with the potential to put themselves into relation to a staff member's ideas and knowledge about statistical tests. Subsequently, his group was able to forward a possible statistical test<sup>12</sup> when presenting the preliminary results of their experiment during week 2 of the module, as discussed in the previous chapter. Out of the fifty students working within the laboratory, only two groups (eight students) forwarded possible statistical tests to analyse their data, during the first phase of presentations. As shown in Matthew's comment below, by grasping quickly how to play the epistemic game, he felt at an advantage:

*Luckily at the end [of the presentation acetates] I kind of wrote down a possible test [chi-squared test] that we could do for it [the statistical analysis] at the end which was really good because George actually sort of corrected it and then suggested a better test [a t-test] to do which meant that when we came to the second presentation [in week 8] we had done the right one. Whereas the majority of people hadn't asked that [suggested a possible statistical test] in the first presentation and had done what we would have done if we hadn't written it down and then corrected it, after the first presentation. So we had a bit of an advantage in that. [T2/68 2006]*

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<sup>12</sup> Through personal communication with the PhD student it was determined that this group had received help concerning their statistical analysis.

The communicative academic play seems to have acted as a transitional phenomenon (Winnicott, 1951) for Matthew where he put himself in relation to George's ideas and used them creatively thus further moving away from the feeling of separation he indicated initially at the start of the module, to showing a sense of integration in terms of the experimental design and preparedness to engage in conducting it:

*When we did the presentation I thought, I got my head around this. I thought, I understand this and [George] suggested a statistical test that we could do. So in some ways I think, yeah I should do it now really, I'm prepared to do it. [T1/47 2006]*

Matthew's transition was also facilitated by actively seeking help, putting himself into relation to the knowledge of George to play further with his ideas:

*Helen: I noticed that you buttonholed George at the end of the [laboratory] sessions?*

*Matthew: I was just thinking ahead, yeah.*

*Helen: Was there something that you were particularly quizzical about, or something that you needed to know?*

*Matthew: No just really how we were going to analyse the results. We had sort of paired sets of results, [so] how to use a paired t-test that sort of thing. But it was mostly based on the first presentation and the feedback we had got from him. [T2/23/2006]*

Similarly to Angela, Kate and Nicky's reports in the previous empirical chapters, where they showed that by planning their own experiment in advance they had appeared to experience Winnicott's (1950a) second stage of learning where they now

knew what they were doing, Matthew also indicated that he was ahead with the planning of his experimental design which seems to be ‘me’:

*Matthew: [By presenting a possible statistical test] At least it shows you’re engaging with it and thinking about it [the statistical analysis] and yet at the end it wasn’t that difficult particularly and we did it right and there were a lot [of students] who didn’t sort of do that very well. So it’s key to get on with it early. That’s the first thing you should do really. [...] So stats are always a part of the experiment itself and the writing comes after.*

*Helen: So is that something that just came to you naturally, or perhaps, do you think it could have actually been drawn out by the teaching method?*

*Matthew: I think it was drawn out a little bit, but it always comes naturally to me to try and engage earlier. I like to have everything pictured in my head, what I’m going to do and how I’m going to do it [...] So I start really early thinking about what needs to be done. [T3/38 2007]*

Therefore, the holding environment provided by the module ADDE seems to have been congruent to Matthew’s learning because he had the ‘inner’ capability to think ahead and play the epistemic game, plus the confidence to seek the help he required. In his final interview at the start of the third year Matthew indicated further emergence in his capability to put himself into relation with the ideas of teaching staff showing a further move during his degree study to uncover his voice, aiding his personal development as an ‘enquiring’ (Rowland, 2006) learner:

*I’m very inquisitive and just about after every sort of lecture, I’ll go and ask*

*questions and it does build up a good relationship with your lecturers. I know most of my lecturers - but most people [students] don't know them at all and yet one of my friends, like before I got to know her, she said 'Yes I know you. You're the "always asking questions boy".' So to call me, that. So it's part of me. [T4/19 2007]*

It will be shown later that not all the students approached George for help as easily and confidently as Matthew and thus, did not create the overlapping communicative play spaces that appear to have facilitated his transition.

I now move to explore the students' transitional experiences that were not as smooth as those of Matthew.

## **2. Group B: Cases of help-seeking: Moving away from preliminary chaos and stuckness**

*Group B* includes Alan, Angela and Kate. All these students experienced difficulties, but this appears to have been enabling because, as George hoped, they were able to overcome their ontological difficulties outlined earlier and put self in relation to the new and radically different outer, play persistently and forge connections. Importantly, seeking help from George facilitated all students within this group.

Firstly Angela, Kate and also Nicky (*Group C*) who I discuss later, worked together in the laboratory. All commented that they did not consider the statistics as part of their experimental design until they attended the lectures in weeks 3-5<sup>13</sup> showing the structure of the module did aid them to begin to engage and play the epistemic game. But whilst the group connected a statistical test within the creation of their design,

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<sup>13</sup> See module timetable in Chapter 6

because of the open-ended nature of the experimental design, the results gathered were not as anticipated. Therefore they had to play persistently, exploring the use of other statistical concepts. As Kate said:

*I think when we started planning it [the experiment] we thought about a chi-squared test. But then sort of, you realise that it [the data] doesn't fit into that and actually, you have got to do it like this and things change and suddenly that test doesn't fit anymore. I think I ended up doing a t-test and a regression line so we did think initially about it a little bit, but probably not enough. But the thing is you do the experiment and then, it is only then that you realise what you have to change, so it is a little like a chicken and the egg thing really. [T3/10 2007]*

Kate's comments suggest that the selection of a statistical test to connect to their experimental design was experienced as being uncertain. In contrast to Matthew, Kate said that her group needed more emphasis upon surfacing the epistemic game, sensing that although efforts had been made by teaching staff, it had for these students, remained tacit:

*I think that when we were designing our experiment maybe there should have been more emphasis on, remember, like look into the statistics that you are going to use. I suppose there probably was but we just didn't realise how important it was until we got to the point where it was, 'ouch', I don't know how to do this. [T2/18 2006]*

Angela also experienced problems when independently selecting and applying a statistical test. It would seem that she sensed a separation from the past in which she was instructed how to analyse the data, to moving to find the statistical concepts, or

‘bits’ (Phillips, 1988a: 86) she will need. Her comments below reveal the difficulty she experienced:

*[M]y data doesn't fit any of the examples I have been given. You know, you are following a text book and the data just doesn't fit it and if you don't know what you are doing you are just screwed basically you can't see what is wrong because you don't know what is wrong. I think we had a bit of a problem with that because our data didn't fit any examples that we had been given and we didn't understand it well enough to know what to do. [T2/75 2006]*

Kate and Angela's group (including Nicky, *Group C*) were prompted to refine their data analysis during the second presentations, in which feedback provided by George was 'non directive' (Wyatt-Brown, 1993:300). Here, some guidance is provided, but the students remain in a position to creatively discover meaning for themselves, as George illustrates:

*Most times when students have made a minor mistake I will usually ask them a question you know, "Why did you do this?" Then they can hopefully take that into consideration. [T2/17 2008]*

Therefore, Georges's feedback was a potential transitional phenomenon, where students need to find it and play creatively with it. As Angela said:

*Kate and I wouldn't have questioned our stats in the second presentation, if he'd [George] not [asked us]. He didn't even say that it was wrong he just asked us something about the degrees of freedom and we were like, 'We don't really know,*

*what you are talking about?’ So that made us go away and think, ‘Hey, why did he ask us that?’ Which I think was quite subtle. [T2/51 2006]*

By putting themselves into relation with the errors in their statistical analysis Angela and Kate coped with their difficulties by engaging in overlapping epistemological communicative play, experiencing preliminary chaos. As discussed previously, these two students developed a strong friendship during their study of ADDE and seemed to be good ‘playmates’. Angela said:

*We did the wrong tests and the number of times that we ran - and Kate was saying you can't do that [test] you've got to use whole numbers. She's quite good at running them by hand, whereas I'm always tempted to use the computer. So we like we got different results and we couldn't work out why and we were on the phone like, how? [T2/6 2006]*

Analytical academic play seems to have been experienced as preliminary chaos by Angela; the first phase of creativity involving mistakes or ‘phases of nonsense’ (Milner, 1978:37). Here, she put herself into relation with new statistical tests and played persistently despite experiencing epistemological gaps that needed to be breached. Below Angela indicates that although she experienced difficulties, ‘barriers’ and anxiety, playing with different ideas and making mistakes is perhaps, the best way for her to learn:

*[I]t was all a bit confusing [...] we kept coming up against barriers, like at first we thought can't use percentages okay, and then we'll do this test and then it was we*

*can't use this test because our points aren't independent. Oh my God, we haven't got any replicates at all, how do we work this out? And we kept doing it like, oh we'll do this then, no that's not right, oh we'll do this then and trial and error. I guess this is the best way to learn even though it just made me feel like crying at times, but it did just seem so obvious and yet, I kept getting it wrong and every time I got it wrong I thought that I had got it right and my housemates just kept laughing at me. By the end of it I was thinking that I just can't do it. [T3/70 2007]*

Although Angela and Kate played persistently with different statistical concepts, they remained unsure about their analysis appearing to move towards an alternative way of thinking, involving stuckness and being in a liminal space. However, like Matthew, they had the confidence to seek help directly from George and put themselves into relation with his knowledge and ideas. In contrast to Matthew who talked to George face-to-face, help was sought via email.

### **Email as a form of help-seeking**

The use of email is a method preferred by a lot of students studying ADDE as George explained; a 'blizzard' of emails had been received in 2006/2007 during the course of my study. To illustrate, during the following year (2007/2008) he counted 137 emails from students<sup>14</sup> seeking help and had also arranged and conducted 5-10 face-to-face meetings:

*Mainly before the end of term when they are writing their reports [...] I tend to get a blizzard of emails. So some of that uncertainty which remained is dealt with within*

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<sup>14</sup> Approximately 150 students study ADDE, as noted in Chapter 6



*that window [....] Most of those emails were about statistical matters, so they are educationally constructive. [T2/6 2008]*

His comments below illustrate the difficulties that staff face when providing a good enough holding environment for students at this disciplinary boundary:

*I mentioned the sort of email blizzard that I got and I wasn't really surprised by that. I sometimes you know I [wake] myself at 3 or 4 o'clock in the morning thinking I mustn't be explaining it well enough because I am receiving more feedback than other modules which I do, saying 'I didn't understand that' or 'I didn't quite understand this'. So once I convinced myself that this is really, I think the nature of the subject matter that there are these conceptual difficulties in actually grasping what this is all about, then I sort of explained the large number of feedback comments that I got in that way. But that is also true clearly, that also means that there are parts of the module that you have to be very diligent at sorting out for the [students] - well there was more extra sort of extra help in that way, rather than a 'normal' module. [T1/ 74 2006]*

George's comments suggest that the statistical concepts could be viewed therefore, as a threshold concept (Meyer and Land, 2003, 2005, 2006) that students need to cross to achieve understanding. In Chapter 7 I showed that George would not instruct the students how to create an experiment and as a result he stated that they might have 'silly ideas' where they 'have their heads with it' because there is no 'right' experiment to conduct. However, he took a different view concerning the data analysis as indicated above, because although there are many ways that the students

could analyse their data, some statistical tests are more appropriate than others. Therefore, he responded to the students' help-seeking requests, providing the holding they required to further their capacity for analytical academic play, as he said:

*I don't feel confident about just taking them half way to the answer and letting them go and find the rest themselves. You know, leaving them 'hanging'? [T2/4 2008]*

Thus, George is instinctively aware that many students at this stage in their learning will require a supportive, facilitative environment. However, he indicated that most students will have engaged and played with different statistical concepts and attempted to make connections with their experimental design before seeking his help:

*Usually they come with quite a consideration of the issues. So you are essentially confirming that their understanding is correct. On balance there are more cases like this than them just saying, ' I don't know how to do it' when they are completely stuck really. [T2/19 2008]*

As shown earlier, Kate and Angela had played with different tests, experiencing preliminary chaos before seeking help from George. Angela asked for help and confirmation about the statistical analysis by email although she was unsure if she could ask. The quote below explains her reasons for contacting George:

*I emailed [George] a couple of times as well about questions that I had sort of, I'd come to the conclusion that what I was doing probably wasn't quite right, but I*

*needed to make sure. And he was great, the responses that he sent back were really extensive and I kind of didn't expect that and it was really helpful, really long answers that made sense. I mean, we were also not - I didn't even know that he could answer to help us and he did, but [he] covered all the options. Because, basically we were doing a chi-squared test when we shouldn't have been and I could see that something wasn't quite right, but couldn't work out why. And he went through how we could have done it, [how] we could have performed it and he told us how, but then he said something like, 'but if you look at it like this, you could actually do this' and it was all clear from that paragraph that that is what we should be doing. But he hadn't just put that, he'd put all this whole spiel about chi-squared and the first bit – so it was still up to us to decide that the second was the option that we needed. So that was quite good, but yeah he was very helpful. [T2/59 2006]*

Therefore, the email provided by George seems to have acted as a transitional object (Winnicott, 1951) which continues to be meaningful, that Angela could pass it on to other group members facilitating them to creatively discover for themselves which statistical test to apply. Kate, who had also previously emailed George for help about the sample size they should use for their experiment, and Angela both commented as to why they preferred the use of emailing as a form of help-seeking:

*Angela: Although I didn't speak to him [George] in lectures I emailed him about the statistics and he emailed a really good answer – a really long answer and that was really good because you've got the time to just sit and read it and read it over again.*

*Kate: I agree and because you don't have the speed of the way he talks, like really fast and like, when he's sitting there he has to think about how he is going to write it*

*whereas when he just talks you know, you just open your mouth and talk. But you sent me the email [indicates to Angela] it was wicked. Really good. [V3/30 2007]*

Therefore, by putting themselves into relation with George's knowledge and ideas about their data analysis, Angela and Kate were facilitated to find the 'bits' they needed and forge connections between statistical tests and their experimental design.

### **Moving from preliminary analytical chaos to integration and transformation**

In the following chapter I report how the understanding of their statistical data assisted Kate and Angela's scientific report writing in which they were enabled to put their experimental results into relation with the wider, scientific literature. As a result, both students exhibited a growth in confidence when analysing quantitative data which George hoped students would achieve in order to increase their capacity for analytical play. Kate showed that she now had a bridge between the past and present to facilitate her 'continuity of being' (Winnicott, 1960c: 47):

*I would say more confident [analysing data] yes I would say so. More because it is in my brain and more because I know I have lots of literature and explanations that I can use to prompt my memory if I need to do anything [data analysis] and obviously the more you study something the more you will understand it. So I think that with the help of lecture notes and things like that, that I think I will do better next time maybe, just because I'll remember problems from this time. [T2/27 2006]*

Kate shows that by experiencing mistakes, problems and playing persistently, her capacity to play has been facilitated. This is also demonstrated by Angela:

*Yeah, slightly more confident, just by doing it wrong and understanding why I was doing it wrong. I think that was the most valuable thing that I got out of this [analysing her own data] [T3/17 2007]*

In addition Angela shows that by engaging in analytical academic play she has a transformed perspective about data analysis and statistical concepts where she can see their importance in the discipline of the Biological Sciences. This bears similarity to Meyer and Land's (2003, 2005, 2006) ideas about threshold concepts in which crossing a conceptual threshold can be transformative for the learner:

*But I can definitely see the application of it [data analysis] now, which is a big difference. It is not just words and letters and theories and just stupid ways of putting things. I mean, I can see it makes a difference. [T3/15 2007]*

Angela's quote below elaborates further, indicating that she has moved to Winnicott's (1950a) second stage of learning away from having a sense of resentment as George commented upon earlier in which learning 'is irritating and even maddening' (p.13) to creating something of her own out of what she has learnt that is now more 'me' thus relevant and meaningful:

*I did just find it [data analysis] particularly hard but having done this I know - I said this in the letter [to a friend] you know? Just having to apply it and I think although it was horrendous having to do it so many times, doing it wrong so many times taught me more than anything I learnt in the last past year 'cos otherwise you are just reading out facts, you know? You have a list of assumptions; a list of equations;*

*a list of symbols and it means nothing. But now I can see what it is proving. I can see I mean I haven't quite grasped it, but like just the concept of statistical significance was just a phrase. If it is just like, if it's words that are just bantered around then it is just not 'clickable' whereas now you get the results it might look all right, but you can use it you know? You can draw a graph on it, you can see your graph, you can see your units - they look good, but I do definitely understand it a lot better now and I can see the relevance. I don't resent learning it because I can see how - its importance and what it shows. Whereas before I was just like 'I don't understand, I'm frustrated, I can't see what the point is, don't make me learn it'. [T3/14 2007]*

To summarise, Angela and Kate show that despite initially indicating ontological difficulties and experiencing analytical preliminary chaos, their capacity to play confidently and creatively with different statistical concepts, their data analysis and experimental design, was increased by: putting self into relation with the ideas and knowledge of others; their ability to find the 'bits' to use, including transitional phenomenon and objects; their determination to play persistently; and having the confidence to seek help.

I now examine the experiences of Alan also in *Group B*. Within his comments I additionally consider those of Ben (*Group C*). Alan and Ben are discussed together because they worked together within the same group and they talked about a number of common themes, although their capacity to play with different statistical concepts and their data analysis differed.

## Creating the 'right' experimental design and analysis: Being unauthentic 'clown' scientists

In Chapter 8 I reported that Alan took a leading role in his group in which he held his group members through their difficulties. I also discussed how Ben engaged with the experimental design at a later time, gaining a stronger ontological and epistemological voice as a group member in the laboratory. Within this section, I show that Alan also took the lead with the statistical analysis, whilst Ben seemed to be disengaged, needing to be held strongly by Alan.

I noted previously that the students needed to grasp how to play an epistemic game that involved connecting the statistical analysis to the design of their experiment. Ben indicated that the episteme was surfaced by attending the lectures, although he still has a sense of worry and a need to play persistently:

*I have to say I didn't think about stats remotely in those first couple of sessions at all because I couldn't remember it. So I found that first lecture on stats was a bit of a wake-up call and since then I've gone all over that and have a bit of a better idea. But I could spend hours rereading those notes and still have a very fuzzy concept of what I'm looking at. So I'm a bit worried about that. [T2 /32 2006]*

Alan took a lead with the data analysis for his group and although he did think about which test to use after attending the lectures, as with Angela and Kate, he ran into difficulties after the experiment had been conducted:

*George said the worse thing that can happen is that you have a bunch of data that you don't know what to do with and that so easily happens. As you know, I found out.* [T3/14 2007]

Alan's difficulties seem to have been compounded by a perception that the raw data gathered by experimenting with animals (fruit flies) seemed imprecise:

*Oh yeah it is rubbish I tell you what it [the experiment] is full of these mamby pamby measurements like and there is no precision in it. It was really bad.* [T2/48 2006]

Ben, who previously showed a sense of compliance when experimenting with fruit flies, also said:

*I mean we didn't know when they [the flies] were fully conscious and when they were fully conscious in the Petri dishes they were just flying about trying to get out. So it was just a nightmare. They only just did anything when they randomly collided - when they were high on ether. It was just a nightmare to do. We just had to think well, we'll do whatever and see what we get.* [V1/2 2007]

The raw data gathered by Alan's and Ben's group therefore, was seen as haphazard and difficult to analyse. As noted by George in Chapter 7 some students might think that they have to conduct an experiment that is 'right' in terms of the data collection. George's comments below draw attention to a further epistemic game that the students need to play, involving the notion of statistical inference:



*It is not a matter of the data being good or bad data - it is a matter of saying what we can infer from them about the population as a whole, or what is generally happening. So I think that the students often come into it thinking that - we have done some experiments, we have got some data, that is what scientists do - what I need to do now is get a seal of approval on my data which statistical significance would supply. And that's the wrong way to look at it completely and so I think that you have to fight against that idea you know, that statistical significance is good and failure to find statistical significance is bad and if they fail to find statistical significance the experiment hasn't worked. And those kinds of ideas are in their minds. [T2/15 2008]*

Ben's comment below illustrates his view of the data:

*It is okay saying that we have got results, but it is another thing to make sense of those results. We have results, but then what are we going to do with them? Again it comes down to the mentality of, 'Are the results good? Can we do a statistical test?' [V1/112007]*

Ben's feeling about an expectation that their experiment should yield significant results connects to George's comments and also previously in Chapter 7 in which George thought that students might think that there is a 'secret agenda' in which there is a 'right' experiment. Ben went on to say:

*But you feel that you should get results because you have been given the ingredients. It is a bit like baking I suppose, you have been given all the ingredients and then not*

*getting a cake, that sort of thing. They must know that you should get significant results. That is what you feel. [V1/15 2007]*

As with Angela, Ben commented that during the lectures on statistics examples were provided in which the data was easily analysed. But he could not put this into relation with his experience of analysing the self-generated, raw data:

*Because we had been taught basically in the lecture, like we did stats the year before [the introductory course], but these were like more advanced stats and obviously, when they give you examples it is all perfect scenarios. I mean if you look at the sheets [handouts] we were given, it was sort of a coin, he is flipping a coin and things like that. An experiment is - it is all perfect and it basically, they have taken the criteria of a test and then fitted the experiment to it and it fits perfectly because it is a theoretical thing, they didn't ever do it. So of course we saw this and we wanted the data to exactly fit a statistical test and if your data is like we haven't got any significant results and it doesn't fit, we are not good enough to start to change the statistical test [...] We don't know all that. [V1/21 2007]*

Therefore, because the raw data could not be put into relation with the statistical concepts and tests taught during the lectures, the data were seen as 'wrong'. Hence, the group coped with their difficulty by manipulating their results, bypassing the epistemic game. Alan said:

*The results are all wrong as well. We just made them all up. [T2/59 2006]*

However, by doing this Alan seems to have a sense of a lack of authenticity and false self which involves 'compliance with environmental demands' (Winnicott, 1960b: 147) where he feels like a 'clown' scientist. His comments below indicate that experimental play has ended because it is 'not going towards anything'. As I discussed in Chapter 3 according to Winnicott (1971) play breaks down when inner or outer reality dominate and the individual as a consequence might become a 'collection of reactions to impingement' (Winnicott, 1960c: 17). Below, Alan shows further restriction upon his ability to play creatively:

*Because it was so pointless really pointless, it just makes me laugh 'cos it is just the stupidest thing isn't it really? Literally everything is fake isn't it? The results are fake it is pointless it is not going towards anything you are not finding out anything. Everything that you are just trying to do gets mucked up and it is - you were just a 'clown' scientist. [V3/12 2007]*

Using the engineered results, Alan again took a leading role:

*The statistics were kind of left to me because I was the only one who had a reasonable understanding of it. No one else was really that good. [T2/37 2006]*

Because Alan did the statistical analysis for his group, Ben did not engage and play further with the different statistical concepts. Hence, Ben did not have a full understanding of the data analysis when he presented their group's experiment in the

second stage of presentations<sup>15</sup>. Ben had moved to a more confident ontological voice, but he still needed to strengthen his epistemological voice in terms of the statistical analysis where he shows a lack of authenticity:

*I didn't really understand them [the data analysis] so I suppose I just blagged it in the presentation that I actually knew what was going on. I knew a rough outline like p values and things like that but I didn't really understand each test. But I don't think that you really have to because in a presentation, it is just show isn't it? [T2/7 2006]*

Ben also demonstrated his need to be held strongly by Alan:

*We thought we were going to get absolutely massacred because we thought he [George] would see straight through them [the data analysis]. Alan was not sure that he had got them right that is why I said to Alan, 'When I have finished [speaking] you must stand here next to me because I have no answers for the stats questions, you've done them, so if he asks them you must jump in and answer them'. [T2/12 2006]*

However, whilst Alan had engaged with the statistics and was aware that the statistical analysis might not be appropriate, Ben seemed to have a sense of reassurance when George did not point out any mistakes:

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<sup>15</sup> The second presentations were conducted during week 8 of the module. See Chapter 6 for the module timetable

*So other groups got really, really destroyed. So ours, we could not believe it - it was like, how on earth has he not picked up on these? It was quite reassuring we were all looking at each other thinking how on earth did we get away with this? [T2 /13 2006]*

In contrast, as with Kate and Angela, the presentations seemed to act as a transitional phenomenon for Alan who had the ability to put himself into relation with errors in his data analysis, although not through the questioning and feedback by George, rather by observing the other students' presentations, as Alan said:

*He [George] didn't even comment upon the chi-squared [test] until I approached him [at the end of the presentations in week 8]. When we did exactly the same probably as everyone else [made mistakes in the analysis], although we did actually make a point about why we were using the chi-squared test. But he didn't actually have a go at us. [T2/36 2006]*

Consequently, Alan decided that he needed to seek help from George.

### **Face-to-face meetings as a form of help-seeking**

Initially Alan considered emailing George, but instead he booked a face-to-face meeting where he could talk through his difficulties, thus creating the potential for communicative play:

*I actually booked a meeting with him [George] you know, after the presentations just to speak to him because I wanted to know what to do, I was quite lost. I had done a whole bunch of chi-squared statistics looking at differences in terms of frequencies*

*etc. of mating behaviours and when I approached him, he said, 'This is all wrong' and he explained it to me that there is non-independence and independence and I really couldn't see it at first. I was like, surely all the results are independent? And I just said to him, 'No matter how much you say I just can't see it – you know what I mean, like a mental block?' But I did yeah, I kind of saw it and it clicked, it was really cool – it was the best thing he did. [T2/52 2006]*

By playing with George's ideas Alan shows he was able to move his understanding forward away from being 'lost' and having an alternative way of thinking where he is stuck in liminal space. In addition, George helped Alan to increase his capacity to play with other statistical concepts and thus, gain a more sophisticated understanding of the data by suggesting a way to extend the statistical analysis:

*Thankfully cos I saw [George] he was talking to me about overall significance and then the component the like [inaudible] significance between the different light intensity. So like okay, there might be an overall significance of all the four light intensities but what is that significance made up of? Is it, is it low and high, or high and low? You know, the non-parametric equivalent. So I went home and looked it all up and I did a Kriskal Wallis to test them all and then I did Mann Whitney for the sub-level significance if you like. And that really extended it. [T2/54 2006]*

Alan's comments below indicate that like Angela and Kate, by playing persistently with George's ideas he was enabled to move away from stuck-ness and creatively discover how to analyse the data. By playing with different concepts and

experiencing uncertainty and mistakes, his learning was facilitated and consequently became personally meaningful:

*It was quite a journey actually because I started off doing loads of chi-squared and everything and it turned out to be completely wrong and I had a mental block. I couldn't see where I was wrong at all and he [George] explained it to me and it clicked and he actually helped me and that was really good. So it really helped me as I learned more, by going wrong and then correcting it - it was kind of like a personal academic journey. So it was good for me - so do you see what I mean? By going wrong and then realising. [T2/63 2006]*

In Chapter 8, I showed how Alan had a growing responsibility for others when leading his group. Similarly, Alan went on to share how the data should be analysed with the rest of the group by email and face-to-face meetings. As Ben said:

*If I had problems with the stats I'd ask Alan. I mean Alan did all the statistics work, I didn't really understand it. [T2/18 2006]*

Therefore, Ben coped with his difficulties by being held strongly by Alan and avoiding engaging in analytical play, appearing to experience disjunction and be in a liminal state. Yet, in his comments below as anticipated by George, he appears to have a greater sense of confidence in analysing data, although he still seems uncertain about independently selecting a statistical test:

*I relied a lot on Alan for the stats which is a bit frightening really cos I didn't know what was going on. I think I'd be more confident at some of it [the analysis] like say, testing for normality, things like that. But when it comes to choosing a test I would have to ask somebody and make sure. I would have no idea now of what statistical test to use. I'd be stuck if someone gave me some numbers and things. [T2/25 2006]*

To summarise, I have shown how the capacity of both Alan (*Group B*) and Ben (*Group C*) to play with statistical concepts and data analysis varied, though they both showed a feeling that their experiment should yield the 'right' results and have the statistical significance 'seal of approval'. The strategy they adopted for coping with this difficulty was to engineer their data, and as a consequence Alan exhibits a sense of false self and lack of authenticity. However, as Eigen (1992) argued, Winnicott's false self has 'at least two horns: toughness and compliance' (p.282), and Alan demonstrated his resilience by taking a leading role in the statistical analysis. His capacity to play with statistical concepts and data analysis appears to have been increased by putting himself into relation with the ideas of others and having the confidence to seek help from George. By playing persistently with different statistical tests, Alan was able to extend the analysis of the data and become more self-confident, and through this his learning has become personally meaningful. However, Ben demonstrated a need to be held through difficulty, indicating a sense of disengagement, avoiding the data analysis and depending upon Alan to show him how to do it. Nevertheless, he was able to show growth in confidence in some statistical concepts, as George had hoped.



I now turn to the experiences of *Group C*. These students alongside Ben as discussed above, showed a sense of uncertainty and stuck-ness concerning their data analysis and the understanding of statistical tests.

### **3. Group C: Cases of uncertainty**

Nicky, Ryan and Wendy (*Group C*) show a lot of commonality in their experiences of this transition. All report difficulty and a feeling of being unable to engage in persistent analytical academic play. Their experiences are discussed below.

#### **Moving to liminality**

Nicky worked in the same group as Angela and Kate (*Group B*). In Chapter 8, I reported that this group had played well together and this continued during the planning of their second presentation in which all group members engaged with the statistical analysis. As noted previously, George alerted the group to mistakes in their data analysis during their presentation.

*I mean we got the degrees of freedom wrong in the chi-squared [test] so [George] asked us about that. But we all had answers as to why we did it and we did make mistakes but we weren't just like, 'Oh, we don't know why.'* [T2/40 2006]

So although Nicky was aware of mistakes she did not play further to engage with new statistical tests until Angela sent her the email from George, as noted in the subsection above. However she was unsure why the statistical test had to be changed (from chi-squared to a t-test) and further analysis undertaken. Hence, she found it

difficult to put her knowledge of the experimental design into relation with the statistical concepts and make connections between them:

*I did ask people in my group [about the data analysis] and they asked me, even during the write up as well which was good as well. But some of us did different tests so. I mean, I did understand the t-test but then it got confusing with the Spearman Rank test and I had to test for normality and I just wasn't sure. It was quite frustrating; I didn't know what test was right and what is wrong. [T3/31 2007]*

Although she played with ideas within her group, Nicky seems to have experienced preliminary chaos and a sense of frustration. As Winnicott (1950a) said when explaining the second stage of learning, 'It has to be felt as real, or else it is irritating or even maddening' (p.13). Nicky experienced the data analysis as difficult and uncertain therefore, suggesting a sense of disjunction and a move towards a liminal state.

Moving to Wendy, I noted previously that at the start of the module she seemed to sense statistical analysis as 'not me' and preferred pure maths. Like Ben, she was held strongly by a group member who took responsibility for the statistical analysis. Wendy's group were also alerted to errors in their data analysis during the second presentations, but because Wendy had not engaged with the analysis, she was not ready to put herself into relation to the feedback comments made by George:

*He did talk to us about that [the analysis] but he was saying very, very difficult things. I think he explains things quite difficult sometimes (sic.). [T2/ 48 2006]*

Wendy therefore, was still unsure about which statistical test to use to analyse the data. She appears to have coped with her difficulty by putting herself into relation with a test that she is familiar with and played 'safe' as opposed to having the confidence to risk playing any further with different statistical tests:

*Wendy: Because I didn't understand some of them [statistical tests] so I just ignored them and focused on the one that I know well - so I'm not sure if it is correct or not.*

*Helen: So you used the chi-squared test?*

*Wendy: Yeah, it is the one I'm mostly familiar with. [T2/ 34 2006]*

Like Nicky, despite taking part in communicative play with her group members, Wendy still remained uncertain:

*No, not okay at all actually [the data analysis] because I was thinking about what test to use and because I was talking to other [group] members and it seemed like, that we were all doing different tests - so I don't know which one is correct. [T2/ 33 2006]*

Finally I examine Ryan's experience. During the first presentations in the laboratory as reported in Chapter 8, George provided feedback to his group about how their data might be analysed. But in contrast to Matthew, who I reported as quickly grasping how to connect a statistical test to his experimental design, Ryan and his group did not seem ready to make such linkages. As they had not considered the analysis of their data the feedback was perceived as a different 'language' which was 'not me':

*Yeah it [the feedback] was more about the statistical analysis bit about what we can figure out from the data we've got. But it seemed quite complicated and also, he did mention some kind of analysis which we hadn't quite gone through yet. But then he explained it to us, but it was a bit incomprehensible if you like, because we hadn't learnt it yet. So it was like some kind of different language to us. [T2/57 2006]*

Ryan also reported his difficulties when putting his raw data into relation with the statistical concepts and examples provided in the lectures. As commented upon by both Angela and Ben, he was unable to forge connections; he had to guess which statistical tests to use:

*Disaster, it was a disaster for me [the data analysis] because basically, as a group, we did [analysed] the data for the [second] presentation as a group and we all worked together and we used the handouts [from lectures] and also those that we were given last year [the introductory module] and we didn't know what exactly we were showing. But we looked at some of the examples that seemed to be similar to ours and so basically it was - even a guess like; you would say it was a guess. [T3/40 2007]*

His confusion seems to have been exacerbated by a perceived lack of 'continuity of being' (Winnicott, 1960d: 28) where Ryan appears unable to bridge his past experiences of the introductory first-year module and the present teaching of ADDE, where the statistics were taught to a more advanced level:

*Ryan: At some point I got confused in a way because we learnt all the statistical analysis part in the first-year [introductory course] and it was sort of a repetition [the teaching in ADDE] but in a different format, so it was kind of a bit confusing.*

*Helen: So did it conflict with what you thought?*

*Ryan: Yeah, that too. So when that happens we don't know what's right and what's wrong, or they could be both correct, so that really confused me. [T3/35 2007]*

All the members of Ryan's group worked together on the planning of their second presentation and so engaged in communicative play when analysing their data. Yet, when George provided feedback, he pointed out errors in their analysis:

*It definitely helped us [the feedback] because we had a mistake in our statistical analysis because we were using the chi-squared test when we didn't need to so that was a good finding for us. [T2/68 2006]*

Ryan went on to work with his group members to refine the analysis of the data. However he reported that their calculations produced different answers which left him with a sense of uncertainty. In contrast to Angela, Alan and Kate's (*Group B*) reports earlier where experiencing problems resulted in persistent play, Ryan appears unable to play further, losing the sense of aliveness he demonstrated in Chapter 7:

*I just felt so lost. I was just put off by myself really, so I just got demotivated. [T2/70 2006]*

Therefore the students' in *Group C* all experienced uncertainty when analysing their data. I reported that the members of *Group B* were prompted to play further with

statistical concepts and their data analysis following the second oral presentations in which George provided feedback. However, the need to change their data analysis was pivotal for all students in *Group C* by which they moved to experience a sense of uncertainty and liminality.

### **Left 'hanging': A need for seeking help**

In contrast to the students within *Group B* who were facilitated by seeking help from George, the students within *Group C* despite their difficulties chose not to approach George for help. I examine their reasons below.

Nicky explained that although she had been forwarded the email from George, she still needed further guidance. However, she decided not to seek help because she was restricted by time:

*I think I should have asked for more help with the results...[it was] just understanding how the tests work. But then I just thought well, I could just spend so much time on that - it is not that I just only had this piece of work to hand in you know?* [T3/ 33 2007]

She commented further:

*Yeah I mean I didn't go to George, apparently he was quite good. But I didn't ask, so. But I had so much of a mass of questions rather than a specific one, so I didn't ask.* [T3/35 2007]

Hence, Nicky seems to have been hindered from seeking help because of a lack of time due to other study pressures and also a sense that she had too many questions

and difficulties to be addressed.

Wendy also did not ask George for help although she was experiencing difficulty.

She said:

*Wendy: Because, I think I did this quite last minute a few days before I handed it in [the scientific report] so I didn't think that I could email him and ask.*

*Helen: So you felt it was too late?*

*Wendy: Yes. [T3/29 2007]*

As demonstrated in Chapters 7 and 8, Wendy required to be instructed how to design an experiment. She also needed further guidance about an appropriate statistical test to use but thought George would not be able to help her:

*Perhaps if George could tell me what test to use and how to calculate this I would feel better but it is impossible! Yes, I would like to know in what situation would you use this test? Tell me directly. Then that would be good. [T3/30 2007]*

So although Wendy realised that there were errors in the data analysis, she was unable to change her analysis:

*Actually I felt that there were some problems when I was doing it already [the data analysis] but I couldn't change it, so I had to go on - even though it is wrong. [T3/19 2007]*

In light of her difficulties, a possible reason for Wendy's disengagement in which she seems unwilling to spend time playing persistently could be that she doesn't experience a sense of aliveness when studying this module, as I reported in Chapter 7. In addition, like Nicky, she senses that she is restricted by time. Her comments below also point to a need to gain the best possible marks:

*To be honest I'd rather spend more time on other modules than this [ADDE]. Because the others [human genetics modules] I have got more interest in and I found it easier, I found it easier to get the marks. Honestly, I'd rather fail this module [ADDE]. I'd rather spend more time on the others. Because if I had to understand the principles [statistical concepts and data analysis] it would take me a really long time and even after I had read the things, I might still not understand. [T3/16 2007]*

Despite feeling lost, Ryan also did not seek help from George. This was because Ryan saw himself as an independent learner. As pointed out by Clegg *et al.* (2006) many students might not seek help even though they might be struggling academically because they associate university with coping with problems independently:

*I've always wanted to do things on my own and come up with my own ideas even before I came to uni, so I didn't think about it [seeking help from George]. [T3/ 35 2007]*

Although these students needed help therefore, they remained as George said 'hanging' in which they were unable to develop their capacity for analytical play.



### **Self-confidence in analytical academic play: Development or a closed book?**

Nicky showed on completion of the module that she was still not confident in analysing data, suggesting a need to engage and play further:

*I'm not confident enough [in the data analysis]. I don't have enough knowledge of the analysis bit - my knowledge of the tests is very basic. I don't know what is going on.* [T3/42 2007]

However, it is important to note that at the start of her third-year of study, Nicky showed a transformation in her capacity for analytical academic play. During an internship in the summer she had the opportunity to engage and play persistently with different statistical concepts and reported that at the beginning of her third-year laboratory-based project, that forms a major part of the final year of study, she had greater confidence in data analysis in which she had created her own statistical model. As George hoped, although Nicky remained uncertain at the end of her study of the module ADDE, she had enough self-confidence to continue increasing her capacity for analytical academic play.

Turning to Wendy, upon completion of the module ADDE she does not express the increased confidence that George hoped the students would gain:

*[I am] not confident. I think it is. I still think it is like choosing the test for the experiments that is still the problem.* [T3/5 2006]

Therefore, Wendy appears to have an alternative way of thinking about data analysis and statistics in which she is in a liminal state. However, Wendy indicated that she

had the capacity to engage further in analytical play at the start of her third-year. She commented that she would be analysing her data for her laboratory-based project and would ask her project supervisor for help, if needed.

Finally, upon completion of the module, Ryan did not feel an increased confidence for statistics and data analysis indicating that he is in a liminal state:

*I don't have much confidence, to be honest. I don't have enough knowledge of the analysis bit. I don't know what is going on. [T3/22 2007]*

Ryan's experience of studying ADDE led him to decide not to undertake a laboratory-based project in the third-year, choosing to do a web-based project instead. I will show in Chapter 10 that Ryan continued to see statistics and data analysis as 'not me' and as George said, a 'closed book' in terms of his 'self-fashioning' (Phillips, 1988a: 86).

In summary *Group C* all experienced difficulties with their data analysis and required extra help to move away from being stuck, 'hanging' in a liminal space. However, all these students made decisions not to seek help from George and were hindered therefore from increasing their capacity for analytical play.

### **9.3 Conclusion**

I have reported the students' different experiences when invited to engage in analytical academic play. At the start of the module, all students viewed maths and statistics as 'not me' and I have addressed the research questions by examining how

they coped, responded and developed in different ways when experiencing this transition. In addition I have examined how their transitions were hindered or facilitated.

Overall, it would seem that at this stage in their learning, the students were not ready to play independently, rather they needed the support of a strong, holding environment, provided by creating overlapping communicative academic play spaces with group members and also the Course Convenor George. At the start of the chapter I emphasised that the module ADDE had been constructively aligned so that students could play the epistemic game by incorporating their data analysis into their experimental design. Although in particular, it is the oral presentations that formed an important part of the holding environment in which George alerted students to errors in their data analysis. When experiencing uncertainty the students in *Group A* and *B* were capable and confident enough to seek help and put him- or herself into relation with George's knowledge and ideas and increase their capacity for analytical academic play. However, transitional space and transitional objects and phenomena have a potential quality (Winnicott, 1971; 1951); it is the learner who must find it, create it and engage playfully within it. Thus, *Group C* was hindered from engaging in help-seeking from George, consequently remaining unsure about their data analysis and left 'hanging' within a liminal space.

Overleaf I summarise the different students' experiences of transition in alphabetical order, and continue to build a profile of their transitional journeys.

### **The students' transitional journeys: Building individual profiles**

**Alan** (BBBB) initially showed a need to play persistently and forge connections during his study of statistics. The feeling that there should be a 'right' experiment led his group to cope with their difficulty by engineering their data, in which Alan had a sense of false self and being a 'clown' scientist. Yet, rather than being compliant, he appears to have a toughness and resilience as a learner, leading the analysis of his group's data. By seeking help he was able to play with George's ideas and knowledge, creatively discovering how to extend the analysis of the data, and increasing his capacity for analytical academic play that has personal meaning.

**Angela** (BABB) showed a sense of statistics as being 'not me' at the start of the module. However, by creating overlapping communicative academic play spaces within her group and through her ability to put herself into relation with George's feedback comments, she went on to play persistently with new statistical concepts. By seeking help from George she was able to move from preliminary chaos towards a more integrated understanding and transformed perspective about data analysis.

**Ben** (CBBC) showed that statistics and data analysis were a source of worry and difficulty. Alongside Alan, he sensed that he should create a 'right' experiment with statistically significant results. Yet, whilst Ben indicated that he had begun to gain some confidence, rather than playing persistently, he again shows his compliance as a learner, avoiding engagement with the data analysis, letting Alan lead the analysis for his group. His dependence upon Alan is shown within the empirical data in which he demonstrates a need to be held strongly.

**Kate** (BAAB) showed initially that statistics and maths was ‘not me’ although an introductory course in the first-year had helped her to gain a sense of aliveness. By engaging in communicative academic play with group members and George, she played persistently with different statistical concepts, enabling a move from preliminary chaos to increasing her capacity for analytical academic play and a growth in confidence.

**Matthew** (BAAA) began to gain a sense of aliveness for statistics during a first-year introductory course. He showed his ability to think ahead and quickly grasped the epistemic game, incorporating a statistical test into his experimental design. This was facilitated by putting himself into relation with the ideas and knowledge of George. Matthew had the capability to seek the help he needed and showed a sense of becoming a more inquiring learner. He also indicates a growth in confidence and a feeling of integration in terms of his data analysis.

**Nicky** (AABC) showed that she increased her capacity for analytical academic play, but remained still uncertain about her data analysis and a move to play with new statistical concepts. She was hindered from seeking help from George, by the sense that she had too little time and too many questions to ask. She completed the module ADDE feeling unconfident about statistics but went on to increase her capacity for analytical play during an internship.

**Ryan** (AABC) initially indicated that statistics was ‘not me’ causing difficulty and a lack of aliveness. Whilst he was able to engage in communicative academic play within his group and put himself into relation with George’s ideas, he still showed

confusion and was unable to forge connections between his experimental design and his data analysis. Yet, despite experiencing difficulty Ryan's sense of being an independent learner hindered him from engaging in help-seeking. Overall, he shows a lack of confidence in data analysis and upon completion of the module ADDE indicates that he is in a liminal state.

**Wendy** (CBCC) indicated that although she had studied maths at A-level, statistics were 'not me'. She seemed to cope with her difficulty by initially avoiding engaging in the data analysis. When alerted to errors by George, Wendy moved to engaging with her analysis, but played 'safe' using a statistical test she was familiar with, as opposed to playing persistently with new statistical concepts. She shows a sense that she was unable to change her analysis and felt that George would not be able to provide help she needed.

In the following chapter I show how the students' capacities for analytical play had implications for their scientific report writing and the development of their voices.

## Chapter 10

### **Scientific report writing as academic play: Becoming a creative scientific writer**

In this empirical chapter I give an account of the students' experiences of transition when writing their scientific reports when studying the module, Analysing Data and Designing Experiments (ADDE). In this academic play space the students write a scientific report about an experiment they designed and conducted as part of a creative group project. I propose that in writing these reports the students have to bring together the 'bits' they need for their 'self-fashioning' (Phillips, 1988a: 86) as a creative Biological Scientist. This involves making connections between their scientific report writing and 'lived' experiences of academic play, as reported in chapters 7- 9, including designing an experiment, analysing data and reading the wider scientific literature. This report represents a move away from the students' prior experiences where they had written about experiments that had been provided by staff in which the introduction, experimental methods, results and conclusions were pre-determined.

I begin this chapter by stating how the students' capacity to play might be discerned and argue that the students' scientific report writing is in many ways akin to Creme's (2008) ideas about 'transitional writing' in which she uses Winnicott to argue that students' learning journals provide an 'academic play' (p.49) space. I then explore the ways that the Course Convenor George provided a facilitative holding environment for the students during this transition before reporting on the students' experiences.

### 10.1 Scientific report writing as an academic play space

The scientific report writing during the students' study of ADDE invited them to engage in academic play in transitional space. Creme (2008) has argued that when writing their learning journals, students are encouraged to be 'playful' by engaging meaningfully with their writing where they 'place themselves as active participants in their learning' (p.55). Through their journals, students are invited to be exploratory with their writing and play with language and 'writing identities' (*ibid.*:62), and in the process they have the potential to forge new connections between 'inner' self and the 'outer' world. This transitional writing space Creme (*ibid.*) argues, contrasts to the 'essayist academic stance' that mirrors 'scientific rationality' because it 'distances the writer from the subject' and tends to adopt a 'dispassionate critical voice' (p.54). So, on the one hand, it could be suggested that a scientific report has characteristics of this 'essayist stance' (*ibid.*:54). Yet on the other hand, it can be viewed as presenting students with an academic play space. In terms of the report writing examined in this study, I propose that the students were invited to bring inner self into relation with the outer report writing, because, I argue, they can convey a sense of self in their writing.

During their first-year of study the Biological Science students had been provided with experiments, for which they were given instructions to follow, in order to achieve results that were pre-determined. So, when writing their scientific reports, the students were provided with all the information they needed within the handouts and protocols. Consequently, in terms of content the students' scientific reports were similar. To illustrate this further, I include comments below made by Angela, who thus far is a 'shocked' 'pushy' and 'resilient' learner:



*In the first-year we were just given experiments which I found to be a bit mundane. So, we all just did the same [experiments] and ended up writing the same thing in our reports. But with this one [the ADDE report] it is different because we have a lot more freedom and it will be individual. [T2/66 2006]*

Angela indicates that during her report writing for ADDE she will move from a sense of compliance and dependence to having the independence and freedom to play and gain a sense of self in her writing and become personally engaged. Thus Angela, and the students studying ADDE have the potential to increase their capacity to play and begin to uncover, a voice as a scientific writer (Batchelor, 2006). She added:

*[I]t is quite hard to write an introduction for something that you have a protocol for 'cos someone has done that work for you and you just end up copying [the notes provided] and that makes it seem a little bit pointless. So in that sense, this one [the report for ADDE] feels like it is very much our own work from A to B. I've also got a lot more freedom with it which as well helps, because you are sort of more inclined to have a go and think what it means, instead of being told what it means. [T2/67 2006]*

The writing of their scientific reports for ADDE seems to represent starting to move away from what Howard (2001) has termed as 'patchwriting' (p.1). Here the student 'merges [his or] her voice with that of the source to creating a pastiche over which [he or] she exercises a new-found control' (*ibid.*:1). Howard (*ibid.*) sees patchwriting not as plagiarism, but as an essential phase that the student must pass through in order to develop his or her own voice. Therefore I propose that ADDE provided the opportunity for students to develop their voices as scientific writers by being invited

to engage in academic play where they could move towards greater freedom and independence in their scientific writing, creatively discovering what and how to write for him / herself, consequently gaining control over a limited area (Winnicott, 1989: 60). Thus, by bringing the knowledge of their previous ‘lived’ experiences of play during their study, together with their scientific report, they might bring her / himself into relation with their writing and thus, forge connections, increasing their capacity to play. I suggest therefore that the students’ capacity to play is discerned in their ability to engage and bring together the ‘bits’ from different domains, that is their ‘lived’ experiences of transitional academic play and their scientific report writing, to play with writer identities and different voices within the scientific literature in order to create a scientific report of their own making.

## **Analysis**

I have drawn upon most of the research collection methods as outlined in Chapter 4 “Research design”, with the exception of the video-session interviews. I conducted within and between cases’ analysis (Miles and Huberman, 1994) using the key thematic codes presented in Table 4.3. I have also drawn upon some of the ideas raised within academic literacies research as presented within Chapter 3 and in particular, the work by Creme (2008). Finally, I have also considered the ideas about student voice of Batchelor (2006, 2008) as detailed in Chapter 8. Although Batchelor’s (*ibid.*) work focuses upon verbal communication, I have found her notion of epistemological and ontological voice useful, especially when considering the ways in which the students developed, or did not develop, their scientific writing voices.

The analysis has illuminated how the students reacted and coped when faced with the transition to move to become a creative scientific writer. I have also cast light upon how their inner capacities to play developed and how their writing was hindered or facilitated.

### **10.2 Holding environmental provision for the students' scientific report writing**

When the students were questioned about academic scientific writing, in contrast to their move to the disciplinary boundary between Maths and Biology, the shift to the boundary between English writing and Biology was not reacted to as being 'not me'. Rather, all the students stated that they wanted opportunities to engage in scientific writing, indicating that they did not view their writing as a 'gap' to breach, but an academic play space to play 'seriously and sustainedly' (Creme, 2008:53) within. This sense of connectedness might also have been facilitated by the holding environmental provision, discussed below.

I begin this section by reporting briefly upon the holding environment provided by the ADDE staff and how it facilitated the students' increased capacity to play during their writing. I consider the second oral presentations and also, a lecture about scientific report writing provided by George the Course Convenor in Week 9 of the module, when detailed handouts were given to the students. I propose that these acted as a transitional phenomenon and object (Winnicott, 1951) part of the facilitative holding environment.

### **Oral presentations: A ‘rehearsal for writing’**

The second stage of presentations involved one group member speaking on behalf of their group, as described in Chapter 6. As suggested by Wyatt-Brown (1993) oral presentations are more usually conducted after the writing process, but they are also useful for the planning and preparation of academic writing thus providing a ‘rehearsal for writing’ (p.301) as was the case here. In Chapter 9 I showed how the oral presentations acted as a transitional phenomenon. Additionally, they facilitated the students’ capacity to play with their writing. Rather than tabulate the students’ experiences. I have included some characteristics of the students’ transitional profiles as reminders of their journeys so far.

I reported in Chapter 9 that Nicky, a generally ‘alive, self-confident, open to change’ learner appeared to experience difficulties when analysing her quantitative data. Her comments show how the presentations aided her writing, helping her to bring herself into relation with some of the statistical tests she used in her report:

*I learnt loads [from the second presentation] and I put most of it I hope, in the write-up [the report]. If I hadn’t done the presentation I wouldn’t have been able to do the write-up I don’t think – especially not the statistical side because we really had to use them and I saw exactly how we had used the data, how we had manipulated it, and how we had put them into statistical tests and I did use some of the tests anyway [in the report]. [T2/ 63 2006]*

Matthew an 'enquiring, alive, confident' learner explained that, as suggested by Wyatt-Brown (1993), the presentations helped him to prepare by providing him with a template upon which to plan his report writing:

*Because we had the presentation layout it was just kind of putting that in front of you on the table and saying. 'Right, how do I sort of buff this up now?' [For the scientific report] [T2/49 2006]*

In addition, the presentations seem to have provided Matthew with a sense of reassurance providing him with confidence to write the report in which he seems to have experienced Winnicott's (1950a) second stage of learning where he now knows what he is doing. As I have noted, Winnicott (1971) saw confidence as important to create and play within transitional space:

*I think it was getting it all planned out [for the second presentations] and clear in my head again and really just knowing exactly what we were doing and the fact that the feedback that we got [from George] was all positive and there wasn't much for us to change which just made it useful. We were confident that we were on the right track - it makes it so much easier for the write up. [T2/ 53 2006]*

Wyatt-Brown (*ibid.*) has argued that during oral presentations students might learn how to use speech as a way of planning for writing. Kate a 'surprised, alive, determined' learner spoke confidently on behalf of her group and indicates that the presentations helped her to engage further with her group's experiment. In turn it

appears that this furthered her capacity to persist and play with the experimental design and analysis in preparation for her report writing:

*It made it clearer [doing the presentation] it helped me because you had to go through it and it was an advantage when writing the project, definitely. I think I learnt a lot about our experiment and we had to talk about it a lot because obviously it was a verbal presentation. So I think I learnt to look deeper and be more scientific as in you know, you have a result and you analyse it and you think, 'Hang on, we've observed this but what about this, this and this?' And not just stop 'cos a lot of people just stop you know? They finish their presentation and then it's, 'Great, that's it!' With this I think it did make me think of other ideas [...] that will be helpful in the discussion - in the write-up. [T2/48 2006]*

Whilst it appears that Kate was aided by undertaking the talk on behalf of her group, her 'playmate' Angela, a 'shocked, determined, pushy' learner, benefited from listening, whilst also making a contribution:

*I'm pleased that I didn't do it [the presentation] 'cos I could take a step back and listen to what she [Kate] had to say and I could still have my own input in that I could make pretty acetates [for the visual aids]. So yeah it was good it does help to get everything clear so that you could start to think about how to write about it [the scientific report]. [T2/ 68 2006]*

For both Ben a 'compliant, liminal' learner with an emerging confident voice and Alan a 'restricted, persistent, leader', the second presentations also helped them to

gain references for relevant scientific literature within their topic area to aid their writing. At the start of the second-year the students were now required to access and read scientific literature, as opposed to being provided with this information by staff. As Alan said:

*I know it is cheating - we had to kind of like steal some references and then we could say in our reports, 'Well we based it on this'. But we found out some really good things [in the literature] and when I actually got on with the writing, I thought, I wish I had read this sooner. [T2/70 2006]*

Ben commented:

*Yes some groups had some really good references that we hadn't thought of so Alan made a note of them for us. It was really helpful for the introduction and discussion [sections within the report]. So as you can imagine there was a lot of backhanding with references going on when we were doing the write-up. [T2/29 2006]*

Finally, Ryan the 'creative, concerned, liminal' learner and Wendy the 'compliant, liminal' learner indicated that the presentation provided the preparation they needed to begin writing their scientific reports, enabling them to play further and put the experimental design into relation with the wider scientific literature. Ryan also seems to have experienced Winnicott's (1950a) second stage of learning during the presentations where he now knows what he is doing. He said:

*Also because we had a better understanding of what we were doing [by doing the presentation] it did make it easy to figure out what exactly I wanted to write and highlight aspects of the experiment itself that I wanted to communicate. So I know what we were talking about, so in the write-up, like for the introduction bit I know what our observations were and everything. So I just need to relate that and support that with some evidence. [T2/63 2006]*

Wendy commented:

*The presentation was really simple, but it helps me understand what I need to write now. But now I need to find out more things [by accessing resources and reading scientific literature] because mine [my report] should have more detail. [T2/52 2006]*

Consequently it would seem that the oral presentations acted as a transitional phenomenon facilitating students to engage in transitional academic writing. Angela, Kate, Matthew, Nicky, Wendy and Ryan all indicated that the oral presentations provided a basis upon which to play with their writing further, allowing them to creatively discover for him / herself. Whilst Ben and Alan reported that it helped them to find the ‘bits’ they needed to put themselves into relation with the wider scientific literature. I now discuss an additional way in which the students’ capacity to play was facilitated.

### **Revealing secrets: A lecture about scientific report writing**

The students’ accounts also show that the lecture delivered by the Course Convenor, George in Week 9 of the module facilitated their report writing in a number of ways.



Detailed handouts about scientific report writing were provided, and these appear to have acted as a transitional object (Winnicott, 1951) remaining important to an individual over time. Thus, the students said that they used the handout during their scientific report writing and also kept it for further use during their undergraduate study.

As I noted in Chapter 6, at the time of this study the module was in the second year of presentation, yet this was the first time that George had delivered this lecture, as he explains below:

*I introduced this lecture at the end [of the module] because the feedback from the students<sup>16</sup> the year before about you know, they wanted to know the protocol about how to do these things [writing a scientific report]. I think, you'll remember in the lecture that I had about twenty minutes with me telling them how to do things and then a list of things that you can get wrong, including the statistics and I think that was quite entertaining for them. I think generally there is a phenomenon that especially if students have some written work to hand in, the more information about what we [staff] are looking for the more happy they are. That is generally my feeling. I mean it was popular and I think you know, they think that there are going to be some 'secrets' that I'm going to reveal [...] but I think it just an emphasis there - a clear picture on the task in hand. [T2/6 2008]*

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<sup>16</sup> The feedback was provided verbally by members of the Students' Council at a meeting George attended with other members of teaching staff at the end of the academic year. Feedback about the module ADDE is also provided by the students in the form of a questionnaire given to all the students at the end of the course.

This holding environment therefore, appears to have been implemented in response to needs voiced by the students, who seem to require this provision at this stage in their learning. Academic literacies research has consistently found that students’ struggles with academic writing might be due to differences in tutor and student expectations and understandings of the requirements for written assessment (Lea, 2005). Yet, this lecture seems to have provided the opportunity for students to put him / herself into relation with George’s expectations and requirements, where as indicated above, they might find what they could view as ‘secrets’ being revealed. In Table 10.1 I outline the secrets of scientific report writing the students viewed as having been revealed to them.

**Table 10.1**

Name of student	Secret revealed
Alan	Referencing (this was indicated by all students)
Angela	Common errors
Ben	Word limits for each section of the report
Kate	How to structure the report
Matthew	How to structure the report
Nicky	Common errors
	Word limits for each section of the report
Ryan	Staff expectations
	Common errors
Wendy	Staff expectations
	Common errors
	Word limits for each section of the report

**The secrets of scientific report writing the students viewed as being revealed**

The students’ reports about the lecture will be considered. Again, I have indicated aspects of their individual transitional journey profiles within their accounts.

Matthew, an 'enquiring, alive, confident' learner, indicates that the lecture assisted his understanding about scientific report writing, away from being confused:

*It is really useful to have that lecture because you now have a framework to know what you are doing, or you could be confused to be honest. [T3/14 2007]*

Matthew also showed that the lecture helped him with certain aspects of his writing, demonstrating a move from being instructed what to write towards greater freedom to discover for her / himself how to write the report:

*[There were] a few things like about introductions and abstracts and the instructions we had in the past were more like, 'we are going to do this experiment and we are going to do this' where as for this [the report for ADDE] it was more about letting us find out how we are to research it and report it and how to write an abstract and reference it accurately at the end as well. [T2/79 2006]*

Kate a 'surprised, alive, determined' learner indicates below a movement from anxiety to Winnicott's (1950a) second stage of learning in which she knows what she is doing:

*I was a bit worried and anxious about it. But because everything had been worked through with us [in the lecture and handout] and I think we had a lot of support from George and I think he gave us a good understanding about how to write the report. So in the end I think I had a very good understanding of what I was doing and a good outline of how I was going to write it. [T3/5/2007]*

As well, Kate's 'playmate' Angela, a 'shocked, determined, pushy' learner, commented that both the lecture and the handout helped her writing:

*Well I found the lecture very helpful. Because I sort of waited for that before I started to write because I didn't want to start on the wrong foot. And I found the handout really useful especially the common problems because you can go through your report at the end and make sure you haven't made those sort of mistakes. [T2/75 2006]*

Wendy a 'compliant, liminal' learner who showed a growing confidence in her voice within her group also stated that the lecture and handout, that had a section entitled 'Specific problems to watch out for', helped her to avoid making mistakes:

*[B]ecause I made quite a lot of mistakes in the previous reports - I mean at GCSE and A-levels. So this time I can see what the marker says, because before we didn't get any feedback. Yes so now at least I know what to do and I'll try to avoid those mistakes. [T2/80 2006]*

Nicky an 'alive, self-confident, open to change' learner, also said:

*I made mistakes but I didn't make mistakes that were in [the lecture and handouts] what he [George] highlighted because obviously in previous years people had done things that he didn't want them to, or included information not needed like in the results or whatever. So that really helped me. [T2/ 44 2006]*

Ryan a 'creative, concerned, liminal' learner noted that the lectures and handouts helped him to avoid making mistakes. In his comments below he indicates that because George has cared for the students by revealing secrets, he now knows what the teacher's expectations are:

*We know exactly what he wants from us in this write-up. So I think it is very important to have that and I'm glad we have that handout. [...] So I found that very interesting because often the lecturers are not always that caring if you like, so that was really helpful.* [T2/ 51 2006]

In addition, within both the lecture and handout specific word limits for each section of the report were revealed. Ben a 'compliant, liminal,' learner with an emerging confident voice and also Wendy and Nicky noted that this had facilitated their writing. Ben said:

*Yeah really helpful, because without the word limits for each part I think I'll just keep on writing and writing and I think in the abstract I'd put more [words] than that and the methods - I think I'd put like 2000 words - but I think that is 500 words.* [T2/81 2006]

In McCune and Hounsell's (2005) study about third and final year Biological Sciences students' development of 'ways of thinking and practicing' (p.255) within the discipline, they identified that the students showed a need for their scientific writing to be precise and concise. Nicky below indicates that by being aware of the word limits she was enabled to be concise in her writing:

*I think the word limit [for the report] was 3000 words so it was good for me - and I think mine was only 2500 [words]. So I think it was important that he explained that it was important to keep it concise. [T3/43 2007]*

Ben also noted that if the word limits had not been revealed he would have been stuck in his writing:

*Because it said the word limits we should aim for. If I hadn't had that I would have been completely stuck, I wouldn't have known what word limit to aim for it was unbelievably helpful. [T3/20 2007]*

Alan the 'restricted, persistent, leader', in his second letter to friend noted how the lecture and handout highlighted how to reference literature appropriately. All the students acknowledged how important this information was, particularly as this was their first piece of academic work at university that had required them to search and access their own resources and make reference to them within their report. Alan's excerpt below is reflective of the students' accounts:

*The lecture in Week 9 was quite helpful and I certainly took on board most of the things he said, particularly in regards to writing references properly. We haven't had to do that before, so I really needed that. [L2 P2 2006]*

In summary, I have shown above that the lecture about scientific report writing and the associated handouts provided by George seem to have aided the students' report writing in different ways, when what might be perceived by students as 'secrets', had been revealed. This included information such as common errors to avoid when writing, how to reference appropriately and also, what word limits to follow.

Therefore it would seem that this teaching environment has provided the holding the students seemed to require, by outlining the pre-determined ‘rules of the game’ with which they could play.

On completion of their report writing the students also commented about the feedback they had received from George. The format of the feedback varied, some students receiving feedback on all sections of the report whilst others only had comments about their statistical results and discussion. Minor errors such as grammatical mistakes were highlighted in pencil within the report and for others, brief comments were written within the margin. All the students reported that the feedback they received was helpful to them and that they would keep their reports to help them with future projects. Thus, the feedback provided to these students by George was also facilitative, acting as a transitional object for the students, continuing to be personally meaningful, aiding their further study in their degree course.

In the section below, I report the students’ experiences.

### **10.3 The students’ experiences of scientific report writing as academic play**

In this section I give an account of the students’ experiences as presented in Table 10.2. I have again provided details of the students’ prior experiences, continuing to build a profile of their individual transitional journeys.

**Table 10.2**

Names of students and transitional Profiles	Experience of Transition
<b>Matthew</b> (BAAA) confident, alive, will to engage, strong voice, epistemic game 'player' enquirer, help-seeker.	<b>Smooth / Congruence</b> (Group A)
<b>Alan**</b> (BBBB) creative, restricted, aliveness for science, group leader, tentative ontological voice, 'clown' scientist, persistent, help-seeker. <b>Angela*</b> (BABB) shocked, inner will to learn, aliveness for science, determined, pushy, help-seeker, preliminary chaos, transformed. <b>Kate*</b> (BAAB) surprised, alive, inner will to learn, open to change, strong confident voice, determined, preliminary chaos, help-seeker.	<b>Hindered / Constructive friction</b> (Group B)
<b>Ben**</b> (CBBC) compliant, little aliveness, liminal, will to engage, emerging confident voice, growing independence, worried, avoider. <b>Nicky*</b> (AABC) alive, self-confident, open to change, emerging confident voice, will to engage, uncertain, hindered help-seeker. <b>Ryan</b> (AABC) alive, creative, self-confident concerned, listener, statistics 'not me' liminal. <b>Wendy</b> (CBCC) compliant, little aliveness, lack of confidence, liminal emerging voice as group member, avoider, statistics 'not me'.	<b>Stuck / Destructive friction</b> (Group C)

Students' working together in two groups within the laboratory:

\*Angela, Kate and Nicky \*\* Alan and Ben

**The students' transitional profiles and experiences of scientific report writing as academic play**

In the following section, I report that Matthew (*Group A*) appeared to experience the smoothest transition, putting himself easily into relation with his scientific writing. I then discuss *Group B* which includes Alan, Angela and Kate who experienced hindrances before moving their transition forward. Finally, I present the experiences of *Group C* including Ben, Nicky, Ryan and Wendy who appeared to be stuck during the writing of their reports, thus hindering their capacity to play. Drawing upon the ideas of Batchelor (2006, 2008) about student voice, I argue that the students in *Group C* experienced most difficulty because they had problems interpreting their quantitative data analysis, as previously discussed in Chapter 9. Therefore, their



epistemological voice in terms of ‘What do I know about statistical concepts and my data analysis?’ and ontological voice relating to ‘Am I a quantitative data analyst?’ were unable to support and strengthen their ontological voice related to ‘Am I a scientific report writer?’ This caused uncertainty for the students because they were unable to make connections between their experimental results and their discussion within the report. In addition, this also caused problems when making connections to the wider scientific literature.

Before moving to the students’ individual experiences I draw attention to the tenses that the students chose to use within the results section of their reports. This was either in third person past tense: ‘The crickets were placed within the arena’, or first person past tense: ‘I placed the crickets into the arena’. George had advised the students, that whilst the third person past tense is seen as the most appropriate tense in scientific writing, many publications now also use the first person where the writer places him / herself into their writing. Five students, Angela, Kate, Ryan, Nicky and Matthew all chose the traditional method used within scientific literature that is, third person passive, past tense and they all stated that they viewed this as the most appropriate tense to use, sensing that this was the ‘right’ method to use. The remaining three students, Alan, Ben and Wendy appear to have been more risky in their writing. They reported that they chose to use first person, past tense because they saw this as the most suitable way to bring the work that they had performed within their groups into their report writing. Therefore, by creating their own experiment these students seem to have moved to feeling a greater sense of self within their writing (Creme, 2008), exposing him / herself to a greater extent within their reports (Hunt, 2000).

The students' experiences are reported below, starting with *Group C*.

### **1. Group C: Cases of tentative, unintegrated writers**

*Group C* includes the experiences of Ben, Nicky, Ryan and Wendy. All these students show evidence of progress in their capacity to play as scientific writers, where they indicate that they moved their ontological voices forward in different ways. However, all show that their writing was hindered by a need to strengthen their epistemological voice, in relation to 'what do I know about statistical concepts and my data analysis?' especially in terms of making connections between their 'lived' experiences of analytical academic play and their report writing.

Beginning with Ryan, who reported that he had been provided with many opportunities to write during his study of the International Baccalaureate (IB) and appeared confident and ready to create and play further with his writing as a creative Biological Scientist. In addition, Ryan had commented how the lecture on report writing and the oral presentations had helped him. However during the writing of his report Ryan experienced difficulties which seemed to hinder his transition. As I discussed in Chapter 9, Ryan had problems with his data analysis and this resulted in his being unable to interpret the data and thus, make connections with the scientific literature. Below, Ryan acknowledges his sense of difficulty as revealed within the pages of his report:

*The whole report just shows my confusion to be honest because at one point, I just got so lost in the statistical analysis, but if that was clear to me then the discussion would be clear then that would lead back into the introduction. I'm fine with sorting*

*out the data averages and everything but I don't have enough the knowledge of the analysis bit ... I still don't know what is going on. [T3/12/2007]*

In chapter 9, I indicated that Kate and Angela appeared to experience 'preliminary chaos' (Milner, 1971:37) when they played with different statistical concepts to analyse their data and Ryan's 'lived' experience of chaos, mistakes and stuck-ness during his analytical academic play has been put into relation with his writing. Ryan also shows a sense of restriction in his scientific report writing which appears to be 'not me':

*It showed me how strict it is [writing a scientific report] and how different it is from High School reports [the IB reports]. I feel that I'm not quite sure if I can do that sort of writing when it is based on data whereas, essay type [writing] is more based on opinion and I prefer that. [T3/34 2007]*

Hence, Ryan indicates that he is developing a voice as an essay writer which is 'me' where he has a greater sense of meaningful engagement and self within his writing. In Chapter 7, I showed how Ryan saw himself as creative, but in his comments below he further indicates a sense of false self (Winnicott, 1960b) involving compliance and restriction when writing his scientific report in which he has difficulty switching his writer identity between essay and report writing styles (Lea and Street, 1998; Williams, 2005):

*I really, I think had to even suppress myself [during the report writing]. [But] I think it was in this actually [points out the introduction to the report], I had given too many background details[...] It became too much of an essay rather than a proper report. [T3/ 40 2007]*

In addition, Ryan's problems seem to have been compounded by his difficulties with statistical terminology where he shows a need to put himself into relation with the theory behind the tests in order to move to a more sophisticated understanding in which he might increase his capacity to play further with his writing:

*I need to know how to discuss matters better [within the discussion section of the report] and extend the aspect of statistical test so it is not simple. [It is] the background of each test which is the difficulty and the names [of the different statistical tests]. When I can't understand the background, I can't remember the name. [T3/38 2007]*

Ryan also experienced difficulties putting his data analysis into relation with the voices of others within the scientific literature. His comments made during his second interview when he was writing his report, illustrate his struggles:

*I think in my discussion I really want to include figures from other experiments hopefully. But that's where I'm struggling at the moment because there is so much information but they are just so raw that I have to persevere and narrow it down so they are relevant to my experiment and that is not easy at all. [T2/ 67 2006]*

On completion of his report Ryan's difficulties appear to have remained and he demonstrates that has moved his writer identity further towards a dissertation style of writing which is 'me':

*Applying the theory to my data analysis is the problem. That is why I prefer the dissertation [style of writing]. But I thought I was better [at scientific report writing] it was quite shocking to find that is a weakness for me. [T3/55 2007]*

Therefore, Ryan seems to have shocked himself by not acting in the way he expected (Winnicott, 1950a) as a scientific writer. In his final interview he showed that becoming a creative Biological Science student was 'not me'. As noted by Mann (2001) students might develop a sense of being alienated if they feel unable to use their creativity. Thus, Ryan appears to show a lack of aliveness and also, difficulty to put himself into relation with data analysis and scientific report writing:

*I do enjoy doing experiments because it requires creativity and coming up with ideas. It's just the latter part of the experiments, the analysis, writing reports and those parts, the office work, just writing up and bits. I felt I wasn't that type of person and also I think after reading those many papers that's been published, the number of times they replicate the experiments is huge and I feel I need more dynamism and changes if I wanted to do that. [T4/28 2007]*

I now turn to Wendy, who also experienced difficulties with her report writing. Previously I showed that Wendy seemed to sense a lack of aliveness during her study of the module ADDE, however when writing her report she expressed greater interest and an increased confidence. It would appear that the reading of the scientific literature acted as a transitional phenomenon for Wendy, in which she can draw upon different voices to facilitate her writing, easing her sense of separation that was felt as being scary:

*Helen: Last time I spoke to you, you said that writing the report had made you more interested in the module?*

*Wendy: Yes, not so scared.*

*Helen: In what way were you scared?*

*Wendy: Because when other people talk about the reports at the beginning [of the module] I thought that there must be lots of words, it must be difficult. But after I had read all of these [scientific papers] it was okay. [T3/34/2007]*

But whilst Wendy showed a greater reassurance in her writing, her comments below reveal the difficulties she experienced when putting her experimental results into relation with the scientific literature included in her discussion. Here it would seem that she was unable to forge connections, which she experienced as a struggle, and scary, as opposed to feeling a sense of aliveness that positive experiences in transitional space can bring (Winnicott, 1971):

*Wendy: Because my discussion does not really come [connect] with the results.*

*Helen: So do you think that this goes back to the problems you had with your data analysis?*

*Wendy: Yes I was scared because of the results, 'Oh my God - it is wrong'. If the results were correct I would enjoy writing the discussion. It was really painful writing the discussion.*

*Helen: But like you say, because you thought that your results were not right.*

*Wendy: Yes. I was struggling to write a discussion. And I was afraid to put in something else which doesn't come [connect] with the results.*

*Helen: Could you give me an example?*

*Helen: Maybe if I say, if I put, 'chicks love yellow' in my experimental results and in the reference it says that 'chicks don't love yellow', if I write these together they would be really contradicting. [T3/ 34 2007]*

Therefore, as with Ryan, Wendy indicates a suppression of authentic self, in which she does not want to bring her sense of confusion into her writing. As noted by Creme (2008) it is possible for students to experience a sense of a 'Winnicottian 'false self' (p.55) in their writing, complying with the demands that writing can impose. Yet, whilst Wendy shows a need to strengthen her epistemological voice in terms of her data analysis, she does show a development of her ontological voice as a scientific report writer, appearing to move away from first-year 'patchwriting' (Howard, 2001:1) as discussed at the start of the chapter, towards greater independence and 'control over a limited area' (Winnicott, 1989:60). Here Wendy appears to put herself into relation with other voices, using their style of writing to creatively discover her own voice. This indicates a move towards Winnicott's (1950a) second stage of learning where she is finding the bits she needs for her self-fashioning:

*I started with reading lots of journals and then see how they start to write the introduction and then I tried to use this style and put it into my report. [T3/ 45 2007]*

Wendy illustrated how she used other voices to help her develop a more professional style of report writing:

*Because I read the journals – the journals are so professional they even say what time they are fed [the chicks] and what time they arrived. So I learned - and then I write it. [T3/48 2007]*

Therefore, putting herself into relation with different voices in the scientific literature, acted as a transitional phenomenon for Wendy because she creatively played with different ideas in order to begin to discover her voice as a scientific writer. So whilst Wendy's accounts clearly show her writing was impeded by her difficulty to make connections between her data analysis and discussion in which her writing was tentative, she was able to demonstrate the emergence of her ontological writing voice.

I now move to Nicky, who also experienced difficulty. Initially Nicky showed that she was confident to have the freedom to write her own report, revealing the satisfaction that comes with play (Winnicott, 1971,1989):

*Yeah because last year we were just given stuff [an experiment] to do and a lot of the writing was done for us. But this year we had to do all the writing ourselves which was much more satisfying. [T3/14 2007]*

Nicky's comments demonstrate that she now puts herself into relation with scientific literature and this provided a sense of moving forward:

*I hadn't done any reading of scientific papers because I didn't know how to find them [...] I think I have learnt the whole thing now I mean only at a basic level but we've learnt about referencing and where to find references and we've learnt where to find journals and where to find books which is a big thing. [T3/20 2007]*



Her wider reading seems to have helped Nicky to put the scientific literature into relationship with her experiment, forging connections between the two:

*I looked at three or four papers, I think and not just with crickets, I looked at other similar experiments and even with other animals - with birds as well. So with all that background knowledge it really helped to give me a general understanding and understand the experiment better. [T3/21 2007]*

Nicky also indicates that her sense of aliveness for the experimental design, as reported in chapter 7, facilitated her writing, suggesting a personal engagement:

*It also helps if you are interested in it as well [the experiment] because otherwise it wouldn't be very interesting to write it and you might not be interested in doing a lot of reading as well. So I think that would show. [T3/33 2007]*

In addition to Ryan and Wendy, Nicky also experienced difficulties in her writing as a result of the problems she had interpreting her data analysis. As I noted in Chapter 9, Nicky was uncertain about changing her the statistical tests after her group members, Angela and Kate, told her that they needed refining and this resulted in her being unable to put the revised analysis of her data into relation with her discussion and make connections between them. Nicky's comments below show how her need to strengthen her epistemological voice hindered her writing, revealing her sense of difficulty within her report:

*Well I could write the results out, but actually it was just understanding how the terms work that was the difficulty. Everything was fine apart from the discussion really. My knowledge is quite basic. So to write my report in more detail, I would need a better knowledge of the tests which I don't have. [T3/45 2007]*

Below Nicky shows her sense of emerging as a scientific report writer indicating a need to play further in order to develop and strengthen her writing voice:

*I think that I need a bit more time to 'get it' [scientific report writing], I mean that is my first one [report] so I just didn't think that it will be perfect. So I just think that I need more time to do more reading and writing. I mean it is really hard in science [...] it is really hard because you don't know exactly what to put in and you can't just waffle on [...] it does need to be concise which I think takes some practice. [T3/28 2006]*

I now discuss the experiences of Ben, who worked with Alan in the laboratory. I reported in Chapter 8 and 9 that Ben had been held strongly by Alan. Similarly, Ben did not engage with the data analysis, rather he was hindered from writing his report until Alan, who led his group, provided him with information about how to analyse the data along with a list of useful references. Therefore, Alan enabled the development of Ben's report writing by providing him with the strong holding he needed. Below I will show that Ben's dependence and need for holding resulted in his not gaining a strong epistemological voice in terms of his data analysis. Hence, like Nicky, Ben's report writing was unable to go into great detail.

Ben illustrated that the report writing had been a source of difficulty, apprehension and challenge, where he shows sense of putting his lived experience of experimental academic play into relation with his writing:

*I was quite apprehensive writing it [the report] I have just never done it before [written a complete scientific report] so that was a major learning step just to learn what you put in each section, the sort of order it is meant to go in. Just generally compiling the whole of the report, just doing it and relating it to an experiment that you have done yourself. It was challenging in places, the introduction was quite difficult and the statistics were quite difficult and I wasn't sure what I needed to go more into and what I didn't. So that was a complicated thing really. [T3/29 2007]*

Yet, Ben indicates the emergence of a tentative voice as a scientific writer showing his difficulties experienced when referring to wider scientific literature and bringing other voices into relation with his writing:

*The introduction was probably one of the worst and just the referencing in it - how much you need to reference? Do you need to give them credit when for if like, you have just taken a little bit? So the whole referencing thing and how to bring what you have read into it [the report] and how then to reference that, that was the worst bit. [T3/35 2007]*

As I reported for Wendy, Ben demonstrates a move away from patchwriting (Howard, 2001) to taking the voices of others and using them to create his own voice, as a scientific writer:

*Then you didn't exactly want to copy [the scientific literature] and then it is putting that into your own words and then referencing that bit there and that was quite complicated.* [T3/36 2007]

Ben's comment below shows that George's feedback have put him into relation with how he might increase his capacity to play as a scientific writer, where he indicates a need to become more independent and engage in meaningful play, enabling him to forge connections between the data analysis and scientific literature:

*I should probably have gone into my analysis a bit more it [the feedback] made it clear there that my analysis probably needed to be in more depth – I don't think that I spent enough time on my analysis on reflection and I think as he [George] stated in my feedback I think that I stated the obvious too much than maybe making more connections between the data and the other work [the scientific literature]. So I might need to spend some more time on my analysis. I shouldn't have relied on Alan so much, really.* [T3/48 2007]

Therefore Ben shows a lack of connectivity within his writing both in terms of his data analysis and with the wider scientific literature. Thus Ben's sense of difficulty during his lived transitional experiences appears to be exposed (Hunt, 2000) within his report, indicating a need to move towards independence and serious, sustained play. (Creme, 2008).

All the students in *Group C* show that their experiences of analytical academic play was exposed within their writing in which they had problems making connections with the wider scientific literature and within the discussion section in their report.

Yet, Ben, Wendy and Nicky do show that they have the capacity to develop their voices as scientific writers despite their difficulties, demonstrating a move away from being a compliant first-year writer. In contrast, Ryan conveyed a sense of restriction when writing his report and a feeling that essay and dissertation writing is 'me'. Ryan also exhibits an accompanying lack of aliveness for his data analysis and report writing.

I now move to report the experiences of *Group B* that includes, Alan, Angela, and Kate. Their experiences differ; although it is their experiences of analytical academic play that initially hindered their writing before they were able to make connections and move on to write a more integrated report.

## **2. Group B: Cases of hindrance, integration and connection**

I start with the experiences of Kate, who explained that whilst she had a sense of anxiety about writing her report because the assessment marks are now counted for her degree award, she appears to have a feeling of 'continuity of being' (Winnicott, 1950c: 28) because the holding environmental provision seems to have resulted in the 'ingrained' understanding George hoped the students would achieve:

*It wasn't as difficult [as I had thought]. I had kind of dreaded it because it was my first piece of work that I had handed in that counted for my degree [...] so I did feel; I was a bit worried, anxious about it. But as I said I think it came naturally after all the work, it wasn't as if we had nine weeks of lectures and then write a report - everything had been worked through with us and I think, we had a lot of support*

*from George and think he helped us to have a good understanding, I think a very good understanding of what we were doing. [T3/37 2007]*

Whilst Kate pushed herself forward with her writing, as discussed in Chapter 9, her group including Angela and Nicky, ran into difficulties with their data analysis following the second presentations. This seemed to hinder her from moving on with her writing:

*Well the presentation provided the backbone kind of thing to the report, so with that and the lecture it kind of spurred me on with my writing. But, well as you know we ran into problems after our presentation with our data analysis. So that knocked me back a bit at the beginning [of the writing] because I wasn't sure what the results were showing. [T3/39 2007]*

However, after seeking help Kate moved away from experiencing preliminary chaos and was able to grasp how to analyse their results. Consequently, Kate's epistemological voice appears to have supported her ontological voice as a scientific writer. Kate seems capable of writing her report confidently, showing her sense of integration within her writing where she has a voice that 'flows' (Savin-Baden, 2008a). This contrasts to the students in *Group C* where their unintegration and difficulty resulted in a lack of connectivity:

*I started with my introduction and method with those being the easiest. And then when those were done it helped me think through to my results and conclusions. I think with reports they are quite simple to write because they have got a definite*

*structure and each section moves onto the next section in a logical way. So I had a clear sense of progression as I worked my way through, you know, a logical progression?* [T3/50 2007]

Kate also noted that she had engaged early with the scientific literature during the design of the experiment. In Chapter 8, Kate commented that she did not like to be behind and her group designed their experiment well in advance. Likewise, by being in relation with voices within other scientific literature at an early stage, seems to have enabled her to make connections easily within her report:

*Yes, well we looked at the literature quite early on because it helped us design the experiment. I looked on the computer and found some useful information by cricket breeders. So I used those references in my report, for my discussion and introduction. But because we knew what we were doing in our experiment it was quite easy to write about other experiments because I'd thought about it in advance.*

[T3/29 2007]

Therefore, Kate's transitional experiences of persistence and determination reported previously, have aided Kate's ability to play with her report writing, showing a feeling of flow and integration with her sense of self, evident in her writing. A sense of self is also exposed within Angela's writing. Angela had indicated that concise style of scientific report writing was 'not me' and consequently, a source of struggle:

*It is quite a difficult style to write in I think [scientific report writing], very factual every sentence makes a point and you can't waffle, There is no scope for flowery*

*language which I struggle with a bit so the writing style was pretty difficult to get to grips with. [T3/22 2007]*

Yet, Angela appears to have pushed herself ahead with her writing. Although her accounts show that she was hindered by the need for her group, including Kate and Nicky, to analyse the data again. Therefore, she had to go back to readjust her writing accordingly:

*I'm also a bit awful in the sense that right when I start something I want to get on with it and I want to do it and then therefore going back and having to change it all - we had come to the conclusion that something was significant when in fact it wasn't and so I'd done my discussion and I'd said that this is significant when in fact no, it isn't, so I had to change everything. [T3/25 2007]*

Angela's transitional writing journey therefore, seems to have involved 'excursions and returns' (Winnicott, 1966:135) whereby returning to her analysis has put her into relation with new and different knowledge about the population density of the crickets, thus allowing her to play with and make new connections with other voices within the scientific literature. As indicated by Kate, this group had put themselves into relation with the scientific literature early, during the creation of their experiment and when Angela returned to reading it, she forged connections:

*But in a way it was really helpful [returning to the data analysis] because it made me think well okay, there must be something else going [...] I mean population density was something that I didn't think about at all so I re-read the papers and I*



*had basically skim read them, and I had completely thought population density, that is completely irrelevant, I'm looking aggression. And then I realised that actually it had a massive effect and that's what - because we didn't have any effect on aggression because we had too many crickets in the box. So it made sense when you got your head around it. [T2/ 85 2006]*

As I reported in Chapter 9, Angela's experience of data analysis was in some ways akin to a threshold crossing (Meyer and Land, 2003, 2005, 2006) in which she developed a transformed perspective. Similarly, Angela's experience has been integrative because 'it exposes the hidden interrelatedness of something' (Meyer and Land, 2006:7). Her comments also show a sense of satisfaction (Winnicott, 1971, 1989) and surprise (Winnicott, 1950a) as a result of her creative play:

*It was quite satisfying 'cos I thought I've actually found a decent reason as to why we didn't get the results we thought we would. I couldn't believe it I thought I was going to have to write waffle basically. [T2/76 2006]*

Therefore, by forging connections between her experimental data and the scientific literature, Angela has strengthened her epistemological voice and has an 'ingrained' understanding, as George hoped, helping her to move away from 'waffling' to become an integrated writer with a report that, like that of Kate, has a logical progression:

*So I was able to just to make it all link together and structure it [...] like structure it in a way that makes a logical progression, you know, into how you come to your own*

*observations? But I've quite enjoyed doing it because I like understanding things and because I'd done quite a bit of reading and we'd talked about it. I thought I do understand enough about this to write a fairly decent write-up.* [T3/19 2007]

As with Wendy, Angela's reading of the scientific literature also helped her writing, putting her into relation with a more professional style:

*I found it quite helpful as I'm writing it to look at papers to see how it is phrased, the order in which things are put, the sort of tense that things are put in. Because it is quite easy to slip into GCSE 'You put the crickets in the box and started the stop clock'. So in the sense of formatting.* [T2/ 63 2006]

Therefore, although Angela was initially hindered and had to move back to analyse her data again and rewrite her report, she was able to play further with her ideas, increasing her capacity to play creatively as a scientific writer.

I now examine the transitional writing experiences of Alan who was in the same group as Ben (*Group C*). As I noted in Chapter 9, these students coped with the difficulty they had in analysing their haphazard raw data by engineering their results. This provided Alan with a sense of false self (Winnicott, 1960c) and a lack of authenticity. However this did not aid them to bypass the difficulty of analysing the data appropriately.

Alan asked for George's help when he experienced problems with his data analysis. This hindered Alan initially from starting his writing, as he said that he wanted to

know what he was writing before he began. However, after his meeting with George, he was able to creatively discover how to analyse his data, moving towards a more sophisticated understanding. By making these connections he was able to gain a sense of integration (Winnicott, 1958b) in his writing:

*I needed some guidance [from George] and it did help to piece together the missing bits for my report. [T3/16 2007]*

So although Alan referred to the report writing as his ‘literary demon’ in his second letter to a friend, by gaining a strong epistemological voice, in which he knows about statistical concepts and his data analysis, Alan was able to forge connections within his report. Below, Alan demonstrates how he played persistently, during his writing:

*I literally, successively went through introduction to the method to the discussion I did it that way. I mean, the way I will work through it [the report] is I will put in the detail then and have a good idea, say in the discussion and then think, that should link to that, and then [I] put it at the bottom of the page and I always address them [the links] at the end. And my sentences will not always be grammatically correct they will be loads of wrong bits and I'll just have them there and then go through them. And then at the end it will just be the case of excessive just fine-tuning, fine-tuning I did that loads with this report actually, loads. [T3/23 2007]*

Alan also demonstrates a sense of self within his writing, bringing his lived transitional experiences of experimental design, where he knows what he is doing, into his report. Alan therefore shows a feeling of experiencing Winnicott's (1950a) second stage of learning in which he can see what he is doing and why. As with

Angela and Kate who saw their writing as a logical progression, he shows that he views his writing as a 'logical creativity':

*When you have done your own experiment you know what you are doing and of its like real when you come to write it, I don't know, I'd like to say it is a logical creativity. [T3/24 2007]*

Alan also showed a development in his ontological voice as a writer. Using the handout provided by George, discussed previously, as a transitional object (Winnicott, 1951) he has moved, despite feeling afraid, to become a more professional scientific writer:

*That scared me even more [reading the handout]. I was afraid to put 'significant' in the alternative [null] hypothesis. But yeah it did help me; put it this way I didn't put significant in my null hypothesis. But again, I may get penalised for the way I stated my hypothesis because I didn't want to look like a baby, in writing, 'This is my null hypothesis'. I mean it was a proper report, so I just said, 'This is what we are looking at' and I did do it in italics to show that it was [the null hypothesis]. But I didn't want to do 'This is our null hypothesis' 'cos it is like year 11 [at school] you know what I mean? Especially after looking at the formats [in the scientific literature] I want to be a bit more professional. [T2/78 2006]*

Alan's reading of scientific literature, as with Wendy and Angela, also appears to have aided the development of a more professional writing style:

*I was not copying the way they did [wrote] it - not the content but the way they wrote it - the writing style they just kind of get to the report and state their intentions and stuff like that and I have really used that really liked that style because obviously there is a consensus there- there is a standard. And the way they wrote their results as well - the format that what you like - the format that is what I imitated, I won't get done for plagiarism for that - it is part of learning. [T2/75 2006]*

Therefore, Alan shows a move to strengthening his ontological and epistemological voice as a scientific writer, increasing his capacity to play, exposing a sense of self within his report.

In summary *Group B* demonstrate how their 'lived' experiences of academic play during their study of the module ADDE are exposed within their report writing. All were initially hindered when undertaking their writing. This is because they needed to strengthen their epistemological voices, in which knowing how to analyse and interpret their data aided a sense of integration and thus, a connectedness, or flow, in their reports. Thus, the students show development of their ontological voices in which they show a sense of emergence as more professional scientific writers.

I now consider Matthew's experience.

### **3. Group A: A case of smooth Integration**

In this sub-section, I report Matthew's (*Group A*) smooth experience. Earlier I highlighted how the oral presentations might have acted as a transitional phenomenon facilitating the students' scientific report writing. As I reported in

Chapter 9. Matthew was the only student to be ahead early with his data analysis, gaining a sense of integration. Below he demonstrates that his group played persistently to create their second oral presentation. Consequently, he was able to put the presentation into relation with his writing, without hindrance:

*I think my [report] write-up is pretty similar to what we put in the presentation. Our presentation was good in that we put in a lot of effort into it so that we had got our results and put them into bar graphs so we didn't have to do a lot more when we came to the write-up 'cos you could just like cut and paste bits of it, or you could just look and make up your own version. So it was pretty much done for us. [T3/35 2007]*

Therefore, Matthew was easily able to find the bits he needed to create his report, linking all the sections together, exposing his feeling of integration:

*The general linking [in the report] it is fine. When we did the presentation we made sure it all linked from the introduction, methods [to the] discussion and conclusions. And we'd found some papers that we could use to explain our results and how previous research had been done. So when it came to the write-up it just helped to clarify ideas, so it was pretty straightforward. [T3/29 2007]*

Therefore, Matthew seems to have easily made connections between his report and the scientific literature. Furthermore, he showed a sense of moving to become a more independent scientific writer:

*It was good to be independently writing it up yourself and not being spoon-fed it. And also the structure is different - much more referencing I haven't done referencing in a project before ever. I kind of associate that with a bibliography at the back of a history essay. You never think about doing it you know at sort of school age. So it's been good, it is a bit more scientific really, I suppose that compared to a professional scientist, it is fairly simple. But I'm on the road now, to how it is done.*  
[T3/ 36 2007]

However while Matthew showed a smooth transition, he did indicate that he had lacked some authenticity in his writing:

*Matthew: But sometimes you may be a little cheeky in your report and say something that you didn't do.*

*Helen: Really? Could you give me an example?*

*Matthew: Yeah cos you think, 'Oh that is what we should have done'. Cos you know there were a few things, like sometimes when we're counting it - counting the results it was so difficult to count them all, so we sometimes lost track. But you don't mention that in the report you just say we counted them and it was fine which is probably not very scientific to do, but never mind.*

*Helen: So is it what you think fits in - it's what is expected in a report?*

*Matthew: In a way yeah, I don't know I'd still be tempted to do that all the time when you are writing a report because you always want the results to come out, don't you?*

[T3/ 38 2007]

As I noted in Chapter 6, the module ADDE seemed to provide the students with a 'contained chaos' (Milner, 1971) where students might rethink the rules and make

mistakes, but their final written work will not be as chaotic. Thus, Matthew indicates a need to contain the chaos experienced when engaging with experimental play, suppressing its inclusion within his report. Matthew's comments also capture, in some ways, the essence of Creme's (2005) ideas where she has questioned if students' learning journals should be assessed. Here, she proposes that if students feel 'judged' (*ibid.*: 292) they might not be necessarily be honest within their writing. This alongside the unauthentic experiences reported by Alan and Ben in Chapter 9, also raise questions about how students might cope within academic play spaces which on the one hand encourage students to be playful and take risks, whilst on the other, examine students in terms of their 'right' answers.

Overall, therefore, Matthew showed the smoothest transition when writing his report, indicating his sense of integrated self within his report.

#### **10.4 Conclusion**

In this chapter I have examined the students' different transitions to becoming more independent creative scientific report writers. In addressing the research questions I have reported on how the students reacted and coped with this transition and in turn, the different ways in which their transition was facilitated and alternatively, hindered. In addition, I have highlighted the ways in which students' developed, or did not develop, their capacity to play as scientific writers.

I began the chapter by outlining how students' transitions might have been facilitated by the holding environmental provision in which the oral presentations and the



lecture by the Course Convenor George and subsequent handout appeared to have acted as both a transitional object and phenomenon, respectively.

A key theme identified, that is common to all the students, is that their 'lived' experiences of transitional academic play during their study of the module ADDE was put into relation with their academic scientific report writing. Consequently, their sense of self was exposed within their writing. All the students' experiences of analytical academic play were influential in increasing their capabilities to play further with their scientific writing, to produce an integrated, connected report. These findings concur with the views of Batchelor (2006, 2008) who has argued that ontological and epistemological voices might support and strengthen the growth of each other, developing a sense of becoming somebody, in this case, a more independent, creative Biological Scientist.

Below, I have continued to add to the students' profiles, building a more complete picture of their transitional journeys.

### **The students' transitional journeys: Building individual profiles**

**Alan** (BBBBB) was initially hindered in his writing because he did not have a clear understanding about his data analysis. However when he was able to forge connections he indicates that he was able to move to a sense of integration, showing that his writing was felt as real and logically creative. Alan also demonstrates a move to more professional scientific writing style.

**Angela** (BABBB) was also hindered during her writing in which her experience involved returning to the literature and her data analysis becoming excursive in her play, relating to new ideas about how to interpret her data. Her sense of integration is shown through the development of her epistemological voice, supporting her capacity to play and create a connected report.

**Ben** (CBCCC) indicated that he needed holding strongly by Alan to facilitate him to write his report. His lack of personal engagement with the data analysis is evident in his writing where he was unable to make connections with the scientific literature and write in-depth. However, he does show an emerging ontological voice.

**Kate** (BAABB) indicated that her writing was initially hindered, but when she grasped how to analyse her data she gained a stronger epistemological voice that she exhibits within her writing in which there is a sense of flow, integration and logical progression.

**Nicky** (AABCC) struggled with her writing because she was unable to put herself into relation with her data analysis and remained uncertain. Consequently she was unable to make connections between her data analysis and her discussion. However she did show a sense of aliveness for her writing and indicated a need for further persistent play.

**Matthew** (BAAAA) showed a smooth transition because he has a strong epistemological voice in which he knows how to analyse his data. By putting himself

into relation with his groups' presentation he was able to link and make connections within his writing, reflecting his sense of integration.

**Ryan** (AABCC) indicated a decreasing sense of aliveness for his scientific report writing and a feeling of restriction, appearing to view essay writing as more 'me'. He had difficulties making connections between his lived experiences of analytical academic play and his writing, showing his difficulty to make connections and a sense of confusion within his report writing.

**Wendy** (CBCCC) showed a sense of aliveness and confidence in her writing despite her difficulties connecting her experiences of analytical academic play to her scientific report. However she did indicate a feeling of emergence in her ontological voice as a scientific writer.

In the following chapter I bring together the students' profiles built throughout the empirical chapters and discuss each of the students' individual transitional journeys.

## Chapter 11

### Students' experiences of academic play: The transitional journeys

#### 11.1 Introduction

In the empirical chapters I have addressed the research questions:

*1. What transitions are experienced by individual second-year undergraduate Biological Science students when invited by teaching staff to engage in potential academic play spaces? How do students react and cope?*

*2. In what ways do students' 'inner' capacities to play facilitate, or hinder academic play? Can students' capacities to play be conceptualised as developing in transitional space?*

*3. How does the provision of 'outer' teaching and learning holding environments facilitate, or hinder students' capacities to play within transitional space?*

Guided by these questions, I have shown how Winnicott's notion of transitional space and play facilitates the close examination of the ontological dimension of transition, thus allowing the illumination of the learners as emerging, becoming and moving in different ways from each other.

The empirical findings illustrate that transitional space is a convergence of experiences ‘multiple events, sensations [and] actions’ (Ellsworth, 2005:60). Therefore, the students’ experiences of transition within different academic play spaces reported within this thesis correspond to the idea proposed in Chapter 3, where rather than seeing learners as moving in a linear path, fixed at different points, Winnicott allows us to view the individual as ‘smudging’ (*ibid.*: 120) the learning self, constantly moving between who we are and who we want to become. Therefore we are always emerging, finding the ‘bits’ we need presented within the outer world to use creatively as part of our own ‘self-fashioning’ (Phillips, 1988a: 86).

In this final chapter I draw together the students’ profiles and present a summary of their individual transitional journeys. I aim to provide a holistic account to show how each student ‘smudged’ (Ellsworth, 2005:120) his or her learning self during their transitional journey, when moving from the dependence and compliance associated with their first-year laboratory study. Within their transitional profiles I have identified a number of learner characteristics and capabilities. Following this, I present my conclusions, including a discussion about the theoretical framework and recommendations to Higher Education (HE) pedagogy and future research in HE.

### **11. 1 Smudging the learning self: The students’ transitional journeys**

In this section I outline profiles of the transitional journeys made by different students in alphabetical order, as reported in Chapters 7-10.

### **Alan: A 'restricted' 'alive' 'surprised' 'persistent' 'integrated' learner**

At the start of Alan's study within the laboratory he reacted by feeling a sense of restriction upon his creativity. In addition, Alan did not show a sense of aliveness for the experiment indicating that the subject of animal behaviour was 'not me'. But, despite these hindrances, he displayed an 'inner' toughness and aliveness to create a successful experiment. So, despite the sense of restriction, Alan moved to play a leading role within his group in which he seemed to 'surprise' (Winnicott, 1950a: 16) himself, developing his capacity for concern (Winnicott, 1963c) for others and discovering a stronger voice. Yet, whilst Alan had a strong leading voice within his group he demonstrated a tentative ontological voice (Batchelor, 2006, 2008) as an oral presenter revealing a sense of self-consciousness when presenting in front of the class. Therefore, in this case the holding environmental provision was not good enough for Alan because he lacked confidence to play further, showing that it was 'not me'.

Whilst leading his group Alan required holding by his fellow group members. But he felt that he was unable to take part in mutual communicative verbal play (Winnicott, 1963b: 1971) within his group, leading to a further sense of restriction. In terms of the data analysis Alan viewed maths as 'not me'. However, Alan continued to take a leading role, analysing the quantitative data on behalf of the group. Nonetheless a perception that students must create a 'right' experiment led his group to cope by manipulating their data, so that they could gain a statistical significance 'seal of approval' upon their data. This feeling of acquiescing to course demands gave Alan a sense of 'false self' and despite engineering the results, he still experienced problems. The second presentations provided the opportunity for communicative

academic play, facilitating Alan to sense mistakes in his analysis. He coped by seeking the help of George. By putting himself into relation with George's ideas he was able to creatively discover how to analyse his data moving to a more sophisticated understanding of his data. Yet, by making mistakes, Alan showed that his learning had become more personally meaningful.

Alan's transitional journey was consistently experienced, as constructive friction, indicating that the holding environment of ADDE was experienced as good enough, with the exception of the oral presentations, as noted earlier. Overall, Alan engaged in persistent and creative academic play during the module and was able to bring together his lived experiences of academic play with his scientific report writing. Here his feeling of integration is evident in his writing.

In Table 5.1 (p.122) I showed that Alan's biographic data demonstrated that he had achieved high grades at A-level and also received high marks during his first-year at university. This could have facilitated Alan's transitions. He also demonstrated an 'inner' drive and his will to learn (Barnett, 2007) appears to have developed during his study of ADDE, helping him to move forward. I also noted in Table 5.1 that Alan was in receipt of a bursary from his Local Education Authority (LEA). Yet, although Alan indicated that his finances were a source of worry, in terms of his study of ADDE this doesn't appear to have impacted upon his transitions. Finally, Alan's sense of aliveness for the Biological Sciences strengthened. At the start of his third-year he conducted a laboratory-based project that forms a large part of the third-year course. He stated that he wanted to continue studying the Biological Sciences at postgraduate level.

### **Angela: A 'shocked' 'resilient' 'pushy' 'alive' 'integrated' learner**

At the start of the module Angela was shown to experience a sense of separation and shock within the laboratory. In addition, she showed a lack of aliveness for the field of animal behaviour, but as with Alan, Angela had an 'inner' toughness and aliveness to create a successful experiment. Angela uncovered an emerging strong voice within her group, and spoke in the first presentations even though her epistemological voice was tentative. Angela found it easy to take part in mutual communicative academic play (Winnicott, 1963b; 1971) creating overlapping transitional spaces, and thus move to experience Winnicott's (1950a) second stage of learning in which her group knew what they were doing and why. The design was also 'pushed' forward by Angela's resilience and inner will to learn (Barnett, 2007).

However, during the analysis of the quantitative data Angela experienced difficulties, where maths was 'not me'. Sensing mistakes after the second phase of presentations, Angela coped with her difficulties by engaging persistently in communicative academic play with her friend Kate, and by seeking help from George. This enabled Angela to return to her analysis, showing a resilience to make connections between her quantitative data and statistical concepts, increasing her capacity to play as a data analyst. During her transition Angela showed that data analysis became more 'me' gaining a feeling of integration and a transformed perspective.

Angela exposed her feeling of integration within her report writing whereby her strong epistemological voice (Batchelor, 2006, 2008) as a data analyst strengthened her ontological voice as a scientific writer, helping her to make connections with the scientific literature, resulting in a report that had a 'logical progression'.



Overall Angela's transitional journey was experienced mostly as constructive friction and her transition to becoming a group member was smooth therefore, the holding environmental provision offered by the module ADDE was good enough for Angela, aiding the development of her capacity to play persistently within transitional space. I showed in Table 5.1 (p.122) that Angela had entered university with high A-level grades and this could have helped her transitions. I also stated that Angela was in receipt of a bursary from her LEA. However, as with Alan, this does not seem to have influenced her transition. That said, her need to work part-time made her push herself further to study hard within limited time constraints.

In the summer of 2007 Angela gained an internship to work in a leading research laboratory. At the start of her third-year, she demonstrated her academic love for her laboratory-based project in Genetics and was to later go on to study a PhD at a leading UK university in Human Genetics.

**Ben: A 'compliant' 'unintegrated' 'liminal' 'worried' learner, with an 'emerging voice'**

Ben initially showed a sense of separation and frustration at the start of his study of ADDE in response to moving to greater independence, showing a need be instructed. He also indicated a lack of aliveness for the experimentation, demonstrating a sense of compliance and acquiescing with the course demands. Consequently, Ben required strong holding by Alan, who led his group. During the first presentations Ben put himself into relation with the experimental design showing a will to engage. By strengthening his epistemological voice (Batchelor, 2006, 2008) in relation to 'I know about the experimental design', Ben supported his ontological voice (*ibid.*) as an experimenter and group member, moving to engage in communicative academic

play within his group. Ben was facilitated by group members to strengthen his voice within the laboratory and during the second oral presentations.

Although Ben uncovered an emerging stronger voice, he demonstrated that maths is 'not me'. To cope with his difficulties Ben avoided engaging in analytical academic play, instead Alan analysed the data for the group. Consequently, during the second presentation Ben did not speak with an authentic voice when discussing the data analysis. Therefore, Ben was 'caught up in the creativity of someone else' (Winnicott, 1971:87) as opposed to personally engaging in academic play.

Ben's lack of engagement, compliance and dependence was exposed within Ben's report in which he was apprehensive and challenged. Bringing his 'lived' experiences together with his writing, Ben was unable to write in detail about his data analysis. That said, Ben did show an emergence in his ontological voice as a scientific writer. On completion of the module ADDE Ben stated a need to change to become an independent learner.

Overall the environmental holding provision for the module ADDE was experienced as faulty, not good enough for Ben. Although Ben entered university with high A-level grades he required the strong support of others, in particular Alan, to facilitate his transitions. However, Ben did show a development in his capacity to play where he strengthened his voice as both scientific presenter and writer.

At the start of his third-year Ben indicated a growing aliveness for plant biology, conducting a laboratory-based project within this field. However, Ben stated that he

would not continue his study of Biology upon completion of his degree, choosing to study Business instead.

**Kate: A 'surprised' 'alive' 'resilient' 'integrated' learner with a 'strong voice'**

Kate showed uncertainty when initially creating an experiment within the laboratory. However, she was open to change and surprised herself, sensing a feeling of aliveness within the laboratory. Although she was worried, she was ready for the freedom to play. Kate was also facilitated by her groups' ability to uncover their voices and create overlapping transitional spaces through mutual communicative play. Thus, these students were enabled to engage in experimental academic play by holding each other, in which Kate showed a will to learn and a determination to move the experimental design forward. Kate also demonstrated the development of a strong voice both within her group and during the two oral presentations where she talked confidently.

Kate showed maths was 'not me'. However, despite experiencing difficulty, her transition was facilitated by transitional phenomenon and objects. By engaging in communicative academic play with Angela and also by putting herself into relation with the knowledge and ideas of George, Kate forged connections between her experimental data and her design. In turn, her strong epistemological voice in terms of 'I know about my data analysis' supported her ontological voice as a scientific writer.

Kate's sense of integration was revealed within her scientific writing, achieving what was felt as a 'logical progression'. Because she engaged early with wider reading she made connections between the scientific literature and her writing.

The holding environment provision provided by ADDE overall was good enough for Kate because her experiences were mostly constructive, or congruent. As I reported in Table 5.1 (p.122), she had entered university through the clearing process yet, Kate emerged as a persistent learner despite experiencing difficulties, developing a will to learn and engage (Barnett, 2007) during her study of ADDE. Kate continued to show her sense of aliveness for Human Genetics and undertook a laboratory-based Genetics project during her third-year of study. Upon the completion of her degree Kate planned to continue her study in the area of Medical Genetics.

**Matthew: An 'alive' 'enquiring' 'confident' 'epistemic game playing' 'integrated' learner**

Matthew had an initial sense of separation when he was designing his experiment, but a sense of aliveness for the freedom provided by experimental academic play helped him to engage. Matthew's group worked well together holding each other through their difficulties by creating overlapping communicative academic play spaces in which play was mutual, with no dominant leader. Matthew uncovered a strong voice within the laboratory and during the first presentation he spoke with confidence despite public speaking not being 'me'.

Matthew viewed maths as a radically different 'outer'. However his sense of separation was eased by his ability to quickly grasp how to play the epistemic game (Perkins, 1997, 2006), connecting with a statistical test to analyse his data with his

experimental design. This was facilitated by the first oral presentation where Matthew put himself into relation to, and played with, the ideas and knowledge of George, the Course Convenor. Matthew's capacity to play with his data analysis was further forged by help seeking within the laboratory, emerging as an 'enquiring' learner (Rowland, 2006). Matthew's 'lived' experiences of academic play facilitated his scientific writing and his sense of integration was exposed in his report.

Therefore the holding environment of ADDE was good enough for Matthew where his experiences were mostly congruent and constructive. As I reported within Table 5.1 (p.122), he entered university with high A-level grades in addition, his father, a retired Biology teacher, supported his learning. This could have facilitated Matthew's smooth transitions. Matthew was in receipt of a bursary from his LEA but his financial resources did not seem to impact upon Matthew's transitions during his study of ADDE.

Matthew's aliveness for Biology continued and he planned to continue his study of Biology at postgraduate level, moving into the area of conservation and land management.

**Nicky: An 'open to change' 'confident' 'alive' 'uncertain' learner with an 'emerging strong voice'**

At the start of the module Nicky appeared confident to play within the laboratory; engaging smoothly in experimental academic play. In addition, Nicky easily took part in mutual communicative academic play. By working with others Nicky developed a sense of responsibility and uncovered a strong voice within the

laboratory where, despite her worry, she willed herself to engage and speak confidently during the first oral presentations.

Nicky appeared to experience most difficulty when analysing her statistical data. This transition presented her with the greatest sense of separation. Yet, Nicky was enabled to engage in analytical academic play by putting herself into relation with the ideas of her group members. Following the second presentation she was alerted that the data analysis had to be changed but Nicky chose not to seek help from George.

Nicky's 'lived' experiences of academic play were revealed within her scientific writing because she was unable to make connections between her data analysis and their discussion in her report. Therefore, her epistemological voice, as a data analyst was unable to support her ontological voice (Batchelor, 2006, 2008) as a scientific writer. However, she did have the confidence to persist in analytical academic play during an internship in the summer of 2007. Consequently, this radically different 'outer' seemed to become more 'me', illustrating that playing 'takes time' (Winnicott, 1971:55). This further helped her study of a fieldwork-based project during her third-year.

The holding environment provided by ADDE seems to have been good enough for Nicky. However, she showed a need for greater holding during her data analysis and scientific writing. I pointed out in Chapter 5 that Nicky had entered university through the clearing process and had struggled during the first-year. However, Nicky's study of ADDE showed her ability to play persistently, increasing her

capacity to play as a more independent, creative Biological Scientist. Nicky's aliveness for Biology was exhibited in her plans to study Environmental Biology at postgraduate level.

### **Ryan: A 'creative' 'alive' 'concerned' 'confused' 'restricted' learner**

Ryan initially seemed confident to engage in experimental academic play, in which creativity was viewed as 'me'. Ryan appeared to have an associated sense of aliveness when creating his experimental design and he was also capable of engaging in mutual communicative academic play, uncovering a voice that shows concern for his group members. He indicated that communicative play provided the holding he needed, aiding him to make connections between perceived epistemological gaps. Ryan also demonstrated an emerging voice as a scientific presenter and spoke during the first presentations.

Ryan was to later experience problems and hindrances in terms of his data analysis where statistics was 'not me'. This caused difficulty and a lack of aliveness for Ryan. Although he engaged in communicative academic play within his group and put himself into relation with George's ideas, he still showed confusion. Despite experiencing difficulty Ryan's view of being an independent learner hindered him from engaging in help seeking. Overall, he showed a lack of confidence in data analysis and indicated that he was in a liminal state (Meyer and Land, 2003, 2005, 2006).

Scientific report writing also appeared to be 'not me' and Ryan revealed a sense of restriction. He showed confusion when making connections between his lived

experiences during his study of ADDE and his writing, exposing a lack of connectivity within his writing. As a result of his transitional experiences Ryan began to show a move away from laboratory-based study in the Biological Sciences. At the start of the third-year he stated that for his project he was to undertake an alternative, web-based project. Therefore, although George hoped that students would increase their confidence to play further with data analysis, it would seem that it is a 'closed book' for Ryan.

Overall the holding environmental provision for Ryan began as good enough and he engaged smoothly when creating an experimental design. However, Ryan needed greater holding and guidance when analysing his data and writing his scientific report. In Chapter 5 I reported that Ryan had studied the International Baccalaureate and he felt well prepared for university study. However, he seems to have surprised himself during his study of ADDE, demonstrating a diminishing sense of aliveness. Upon completion of his degree, Ryan planned a career in Business.

**Wendy: A 'compliant' 'liminal' 'avoiding' learner who showed an 'emerging voice' as a group member**

Wendy experienced the most difficulty during her study of the module ADDE. Overall she showed a sense of compliance and a lack of aliveness for academic play. At the start of the module Wendy experienced a sense of separation, indicating that she did not want to move from being a compliant learner within the laboratory, demonstrating a need to be instructed. Therefore, Wendy initially showed a sense of disjunction (Savin-Baden, 2000, 2008a, 2008b) and need to be held strongly by a more dominant group member thus, 'caught up in the creativity of someone else'



(Winnicott, 1971:87). Furthermore, Wendy did not indicate a sense of developing her voice within the laboratory. However, following the first oral presentations she put herself into relation with the ideas of George and her voice began to emerge as a group member.

Wendy also experienced problems with her data analysis, but chose not to seek help from George. Consequently, she analysed her data with a 'safe' and familiar statistical test rather than extending her capacity to play further. In turn, her writing exposed that she was unable make connections between her experimental results and analysis, although she did show an emergence in her ontological voice as a scientific writer. Overall, ADDE presented Wendy with gaps that she found difficult and was not confident to breach. This illustrates the potential nature of transitional space and the academic play spaces provided by ADDE, in which they are not inevitably transitional, rather it is the learner who decides if they are confident enough to create it and play within it.

Although Wendy demonstrated that she did emerge and develop during her study of ADDE she showed a need for a stronger holding environment at this stage of her learning, indicating that her transitions were liminal. In Table 5.1 (p.122) I reported that Wendy had entered university through the clearing process and this could have impacted upon Wendy's difficulties. Wendy also showed a lack of aliveness for her study of ADDE, yet she reported success in the Human Genetics modules in which she had greater interest. At the start of her third-year study, Wendy's sense of aliveness for Human Genetics strengthened and she conducted a laboratory-based

project within this area, stating that she wanted to continue her study of the subject as a postgraduate, hopefully conducting cancer research.

## **Discussion**

The profiles of the students' transitional journeys during their study of the module ADDE exemplify the complexity and idiosyncrasy of transition. Overall, the study demonstrates that the ontological dimension of transition can have powerful influences upon the progression and also hindrance of students' transitions.

I have detailed the different ways that students reacted, coped and developed personally when faced with transition and highlighted how the development of students' 'inner' capacities to play varied. For example, the development of self-confidence, toughness, aliveness, persistence and a will to engage and learn (Barnett, 2007) had strong influences upon the facilitation of transition. On the other hand, a sense of compliance, a lack of confidence and little aliveness tended to hinder transition, making it more difficult. Working with others, where students were provided with the potential to create overlapping transitional spaces through mutual communicative play appeared to provide the smoothest transition. This could have been because verbal communication appeared to act as a transitional phenomenon, part of the facilitative environment, acting as a bridge between the inner self and the new and unfamiliar. Alternatively, the greatest sense of separation and difficulty was prompted by the potential of analytical academic play which was experienced as mostly, liminal. For example, in Chapter 2, 'Context of the study' I noted that there is concern in the Biological Sciences about the mathematical abilities of students (Tariq, 2002, 2004; Hack and Kendall, 2006; Metz, 2008). In confirmation of this

perception two students, Ben and Wendy, had studied maths beyond GCSE but during this transition all students required strong, holding environmental provision. Therefore, the students needed support from the Course Convenor, George, in order to increase their capacity to engage in analytical academic play. The students who felt confident to seek help from George were found to be the most successful.

More concretely, Biological Science students' 'lived' experiences of transition during their study, particularly of data analysis, was pivotal for the students' ability to create an integrated scientific report. The students who experienced difficult transitions exposed a sense of unintegration and lack of connectedness within their writing. Therefore, the findings above illustrate that transitions can be experienced as smooth or alternatively, they can be more challenging, both emotionally and academically.

In Chapter 5, I sketched biographic accounts about the students' prior experiences so the reader could gain a more holistic account about the student cases. It might be expected that a lack of financial resources and lower social economic status could impact upon transition, but I did not find this to be so. For example, Angela's need to work part-time gave her sense of becoming more 'pushy' and organised in terms of her academic study. As well, the students' A-level qualifications did not necessarily predict the students' experiences of transition. For example, Ben, who had high A-level grades, experienced stuck-ness, hindrance and liminal space. By way of contrast, Kate who entered university through the clearing process, overall experienced smoother experiences. This shows that although prior experiences and knowledge might help to bridge the past and the present, other factors such as a will

to learn, the capacity to play and an aliveness for a subject can also forge students' transitions. As Winnicott (1950a) proposed, individuals might 'surprise' (p.16) themselves, acting in a way they did not expect when faced with uncertainty and change.

A developing sense of aliveness and being and becoming a Biological Scientist showed variation, yet can be grouped. Ryan reported that his experiences of the module ADDE caused him to move away from becoming a creative Biological Scientist. At the start of the third-year he showed a further shift, choosing to have a career in Business. Similarly, Ben wanted to take a similar route, although he still expressed an interest in Biology. The remaining six students, Alan, Angela, Kate, Matthew, Nicky and Wendy all demonstrated a development in their sense of aliveness for the Biological Sciences and their hopes to study the subject further at postgraduate level indicate their feeling of becoming Biological Scientists. Thus, the study of ADDE could have been useful to the self-fashioning of these students. The subject areas of research that the students aimed to undertake demonstrate a sense of making the 'world a better place' (Rowland, 2006:1). For example, Wendy hoped to conduct research into cancer and Matthew wanted to return to Kenya and work in the area of land management and conservation. These students therefore, have put their study of the Biological Sciences into relation with the 'outer' world and are expressing their sense of aliveness for their subject. Rowland (*ibid.*) has argued that academic love for a subject can make an important contribution to students' learning at university yet, this tends to be overlooked. However, this study has shown that a sense of aliveness was an important influence upon students' transitions, including their future transitions as Biological Scientists.

I have also illustrated how the learning and teaching holding environmental provision facilitated, or hindered the students' transitions. Overall most students experienced the holding environment provided by ADDE as 'good enough'. I was able to usefully, yet simply, illuminate this by clustering the students' experiences into three strands throughout the thesis that is, 'smooth', 'hindered' and 'stuck'. However, I have shown that there are variations within these strands. For example, students might move into and out of the strands in different ways, even though they appear to have the same pattern of transitions as other students. This highlights the idiosyncrasy of transition and shows how individuals might emerge and smudge him / herself in different ways. By using Winnicott's ideas I have been enabled to illustrate that students' transitions involve a delicate balance between the 'outer' holding environmental provision and the 'inner' capacities and abilities of students in order to realise the potential that transition might bring.

The empirical findings overall, show that at the beginning of the students' second-year degree study their stage of development concurs in many ways with Winnicott's (1960a) theory of the infant's journey in which they are in the phase of 'relative dependence' (p.46). Here, students still have a need at times for dependence and require the sensitive holding by teaching staff in order that they have the confidence to engage in transitional space.

### **11.3 Conclusions**

I start my conclusions by highlighting the strengths of using Winnicott's theories in the examination of students' transitions in Higher Education (HE). I will then make recommendations for HE pedagogy and future research.

## **Winnicott's theories and researching the transitions of students in Higher Education**

By using Winnicott's theories about transitional space and play I have been enabled to cast new light upon individual students' experiences when faced with transition within HE, examining the ways they might personally cope and develop and how transitions might be hindered or facilitated. In so doing, I have widened Winnicott's overarching theoretical framework by situating his work within contemporary theories and research within HE, identifying key ideas and writers relevant to students' transitions. In particular, I have demonstrated that Winnicott's theories are closely aligned to work in HE that examines the ontological aspect of learning, involving self, development, emotion and identity. The key contribution to the framework I have developed is the seminal work of Creme and Hunt (2002) and Creme (2008) about the notion of academic play. This unites Winnicott's ideas about transitional space and play to HE, allowing a closer examination about what determines academic play and how students' engage within transitional space.

Otherwise, the views of Barnett (2007), particularly his recent writing about the 'self-travel' (p.76) of students in HE allowed exploration of the development of students' 'inner' will to learn, personal capabilities and qualities. Rowland's (2005) view about academic love has supplemented the examination of Winnicott's (1971) writing about aliveness, in terms of studying a discipline. The work of Bachelor (2006, 2008) about student voice has connected well to Winnicott's (1971, 1963b) notion of communication, most usefully extending his ideas within a HE context. Milner's (1971, 1987) ideas about contained chaos and preliminary chaos respectively, provide another view, enabling us to think about how transition might be experienced and the pedagogies academic play spaces in HE present. The concept

of liminal space, increasingly used in HE in terms of threshold concept theory (Meyer and Land, 2003, 2005, 2006) has been helpful to draw upon because it provides an alternative space where students might be stuck, dependent and unable to engage within transitional space.

By connecting Winnicott to the contemporary research in HE that is closely aligned to his key ideas, I have been able to form a powerful theoretical lens, shedding new light upon the overlooked notion of the student in transition within HE. However, it is important to consider that Winnicott's ideas might invoke theoretical and policy tensions. This is manifested in the views forwarded by Ecclestone and Haynes (2009) who propose that a therapeutic view of education, including that within HE, is 'dangerous' and should be discarded. Rather, they advocate an education system where emphasis is upon the acquisition of epistemological knowledge, claiming that education should be emotion free, stating that academic life is being undermined by 'the promotion of vulnerable 'identities' and an obsession with feelings' (p.104). In so doing, Ecclestone and Haynes (*ibid.*) are critical of the ideas forwarded by Barnett (2007) and Rowland (2005) whose work has informed mine. I can take issue with Ecclestone and Haynes's (*op.cit.*) view, for I have demonstrated throughout this thesis that the ontological dimensions of transition have powerful influences upon learning. To highlight the emotional aspects of learning is not as Ecclestone and Haynes (*op.cit.*) would have it as constructing the learner as 'vulnerable', far from it, in my view pedagogical practices and policies should highlight the development of students' personal capabilities and qualities, such as resilience, self-confidence and aliveness and it is to this I now turn.

## **Recommendations for Higher Education pedagogy**

In this section, I bring together insights reported within this thesis with Higher Education (HE) pedagogy to provide some concluding thoughts. In Chapter 4 ‘Research design’ I emphasised the difficulties that case study methods have in terms of generalising their findings. However, whilst I am mindful of the limitations, I propose that some useful observations might be made.

In terms of laboratory class teaching within HE in the UK, in Chapter 2 I highlighted that there has been a call within a review of current trends in Bioscience laboratory class teaching (Adams, 2009) and by the Bioscience federation (2005) for a move towards more interesting and challenging teaching methods, including inquiry instruction. Yet, it would seem that at the present time most teaching staff within the Biological Sciences are opting for more ‘risk free pedagogy’ (Barnett, 2007:145) in which they are ‘spoon-feeding’ (Adams, 2009:1) students. However, by moving to non- traditional, inquiry teaching methods, there are key benefits to be made in terms of the personal development of students, as I have shown within this study. This pedagogy for example, aids students to learn how to design experiments and also helps them in the use of different equipment and experimental techniques (Jervis, 1999; Bioscience Federation, 2005). Further, Collis (2007; 2008) has highlighted that laboratory classes can provide valuable opportunities for social interaction with both peers and staff, fostering a sense of inclusion and in addition, a sense of participation within a ‘community of scientific practice’ (Adams, 2009:5). This supports the findings of this study which showed the different benefits that can be gained by students when meaningfully engaging with their experimental designs and also, participating in effective interaction with teaching staff and peers.



The provision of inquiry laboratory instruction that gives students greater freedom to learn might also help to prepare students for work upon completion of their degree courses. This is a key point because there have been complaints by employers that UK universities do not provide students with the practical skills they require (The Biosciences Federation, 2005; Biochemical Society, 2002; Jervis, 1999). This study has cast light upon the personal capacities and learner qualities that might be developed and enhanced as a result of engaging within an inquiry instruction laboratory teaching and learning environment. It is these qualities that Barnett (2007) has argued as being presently overlooked in UK universities. Therefore, by providing students' with the opportunity to engage with pedagogies that offer change and challenge, as opposed to shielding them from difficulty (Ecclestone *et al.*, 2010) HE might play a role in developing for example, students' inner will, resilience and persistence. So that rather than complying with the 'world's knocks' (Winnicott, 1960c: 17) they might develop the strong identities needed to, 'become a member of society - an active, creative member, without the loss of personal spontaneity and without the loss of that sense of freedom which comes in health, from within' (Winnicott, 1960d: 28).

By using Winnicott I also have been enabled to illuminate the importance of the teaching and learning environmental provision and the influences that might have upon students' individual transitions. The empirical findings have shown that as proposed by Winnicott (1971), the potential for a transition to be realised requires the careful provision of a teaching and learning environment in which a student feels confident to learn within and as such, it is appropriate for their stage of learning. I have argued that the second-year students' taking part in this study seemed to be at a

stage of 'relative dependence' (Winnicott, 1960a: 46) in their undergraduate learning where students are not capable of being completely dependent, rather they still need the sensitive support of staff to adapt and correspond to their needs and requirements. This connects to research about 'threshold concepts' (Meyer and Land, 2003,2005,2006) which advocates that when students are faced with difficulty teaching staff require the cultivation of a 'third ear that listens not for what the student knows [...] but for the terms that shape a student's knowledge, her not knowing, her forgetting, her circles of stuck places and resistances' (Ellsworth, 1997:71). For example, the Course Convenor George delivered a lecture about scientific report writing upon the request of students. Moreover, I reported about oral presentations where formative feedback (Sadler, 1989;Torrence and Pryor, 2004) was provided; in turn it helped students to become aware of their mistakes within their data analysis, before they submitted their scientific reports.

I also noted that the module seemed to have been 'constructively aligned' (Biggs, 2003:11) with the aim to facilitate the students' learning. However this study has revealed that transitions are not necessarily experienced as linear, or straightforward as implied within the simplistic linear learning outcomes model, commonly used in HE within the UK, as various commentators have noted (Savin-Baden, 2008a; Barnett, 2007; Meyer and Land, 2006; Rowland, 2006). Rather they might involve hindrances and hesitations, stuck-ness, returns, oscillations and excursions. As well some transitions might be experienced as more challenging personally, academically and emotionally than others. Therefore, the use of Winnicott helps us to understand that the emotional and personal development of students is not necessarily straight

forward, or indeed the 'soft outcomes' (Ecclestone and Haynes, 2009: 50) of learning.

Winnicott therefore, helps us to see that the technical design by teachers and course designers to ensure that modular courses are 'constructively aligned' (Biggs, 2003: 11) where students might be expected to automatically engage in deeper, meaningful learning (Haggis, 2003) does not mirror the picture I have presented of the student in transition in HE. To illustrate, my study has shown that student engagement in transitional space involves choice, where a learner might decide to avoid engagement with difficulty. For example, the study has shown that students' did not necessarily engage with their data analysis after the lectures about statistics, as hoped by George. And even when they did, they did not necessarily meaningfully engage with the statistical concepts, remaining uncertain about their analysis. This reminds us of the 'potential' (Winnicott, 1971:55) quality of transitional space.

Therefore, in light of this empirical study, I propose that HE pedagogy should give greater consideration to the provision of academic play spaces. This could be a source of policy tension, because at the present time there seems to be a resistance to provide students with pedagogies that provide challenge, change and uncertainty (Barnett, 2007; Savin-Baden, 2008a, 2008b). However, by providing different spaces to encourage academic play, students will be given the freedom to learn and gain independence and the potential to engage creatively and meaningfully with their study. Here, they might gain a sense of self and develop personal qualities and capabilities needed to build the strong identities that Winnicott (1960c) advocated,

thus becoming individuals who can cope and develop within a ‘liquid’ (Bauman, 2007:1) world of change.

I now briefly make recommendations about further research using Winnicott’s theories within the field of students’ transitions within HE.

### **Future research in Higher Education**

In this thesis I emphasised that there is little research into transitions within and between different levels in Higher Education. This study has begun to address this shortfall, but there is still a need for future research to examine students’ transitions within different years and levels of HE, including postgraduate study. As well, although this study has focused upon the Biological Sciences, I suggest that Winnicott’s ideas are applicable to a wider range of disciplines in HE and might also be helpful in examining particular groups of students for example, international, disabled, or mature students. Furthermore, in light of the call for new pedagogies for laboratory classes within the Biological Sciences as noted earlier, the use of Winnicott to explore the experiences of students’ transition within a greater range of new and different teaching learning environments would certainly seem timely. Indeed, the use of Winnicott’s ideas that have been overlooked within HE research might be illuminating and rewarding.

In Chapter 2 I noted that a lot of research about students’ transitions in HE has tended to be based upon survey methods. I propose that greater use of qualitative methods, including case study and multiple methods would provide deeper insights into students’ experiences of different transitions.

To conclude, I have shown throughout this thesis how Winnicott sheds new light upon the overlooked ontological dimensions of transition, illuminating how this can have powerful affects upon students' personal engagement and development as they move within HE. Within this final chapter I have emphasised the importance of Winnicott's ideas and how they connect to contemporary research and writing in HE. The theoretical framework has provided a valuable tool to examine how students might personally experience transition, providing fresh insights into how they might develop, react and cope when faced with the new and unfamiliar. I have also shown how Winnicott allows us to think differently about pedagogies in HE where rather than shielding students from difficulty, students can be facilitated to engage with challenge and change alongside the sensitive support of teaching staff. Therefore, Winnicott helps us to think about the provision of pedagogies in HE by considering the facilitating environments that students might increase their capacity to play within. All the same, as I noted earlier, whilst there is an increasing need in HE to provide students with pedagogies that offer the potential to engage with academic play there appears to be resistance to provide students with such opportunities (Barnett, 2007;Savin-Baden, 2008a, 2008b). Taking on this perspective, Creme (2003) asks, 'do we dare allow our students' to be more creative?' (p.276). In light of this empirical study and reflecting upon the theories of Winnicott, I concur with the view of Creme (*ibid.*) who has argued that we should 'allow for a bit of uncertainty in the interests of education, and let [...] students surprise us' (p.276) and themselves and experience the empowerment, aliveness, surprise and satisfaction that transition and academic play might bring.

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**Appendix 1**

Researcher’s name: Helen Mackenzie  
Supervisors: Professor Roger Murphy and Dr Monica McLean

**Participant Consent Form**

The nature and purpose of the research, as well as the data collection and analysis procedures have been explained to me.

I understand the purpose of the research project and my involvement in it and I agree to take part.

I understand that I may withdraw from the research project at any stage and this will not affect my status now or in the future.

I understand that while information gained during the study could be published for academic purposes, all possible efforts will be undertaken to ensure that my identity remains anonymous, such as through the use of pseudonyms.

- I agree to be observed in laboratory classes and lectures
- I agree to provide documentation including letters and a copy of my scientific report
- I agree to be interviewed
- I agree to be audio recorded

I understand that data will be stored in a safe manner, following the recommendations of the Data Protection Act and the British Educational Research Association. Transcribed data will be stored anonymously and separately from any information, which could identify participants (such as, consent forms and emails). Password tools will be used to ensure that information is electronically safe. Physical data such as: audiotapes and back up discs will be stored in a locked drawer in a secure area. Transcripts will be shown only to the supervisors and a peer.

I understand that I may contact the researcher, or supervisors, if I require any further information and that I may contact the research ethics coordinator of the School of Education at the University of Nottingham, if I wish to raise a concern or complaint in relation to how the research was undertaken.

Signed:	Print name	Date
<hr/>		

For participants to retain:

Researcher: Helen Mackenzie - [ttxhml@nottingham.ac.uk](mailto:ttxhml@nottingham.ac.uk)  
Supervisors: Professor Roger Murphy - [roger.murphy@nottingham.ac.uk](mailto:roger.murphy@nottingham.ac.uk)  
Dr Monica McLean – [monica.mclean@nottingham.ac.uk](mailto:monica.mclean@nottingham.ac.uk)

Ethics coordinator: Dr Andrew Hobson - [andrew.hobson@nottingham.ac.uk](mailto:andrew.hobson@nottingham.ac.uk)

Appendix 2

Name of student	Becoming a creative experimenter	Becoming a creative group member	Becoming a creative scientific presenter	Becoming a creative data analyst	Becoming a creative scientific writer
Alan	B	B	B	B	B
Angela	B	A	B	B	B
Ben	C	B	C	C	C
Kate	B	A	A	B	B
Nicky	A	A	B	C	C
Matthew	B	A	A	A	A
Ryan	A	A	B	C	C
Wendy	C	B	C	C	C

The students' transitional journeys within different academic play spaces

Key: A = Smooth B=Hindered C=Stuck