BRIDGING THE GAP: UNDERSTANDING THE EXPERIENCE OF BASIC SCIENTISTS TRANSITIONING TO AN INTEGRATED CURRICULUM

by

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Abstract

The predominant structure of medical education is the “2+2” curriculum where students spend two years in a university learning the basic sciences, followed by two years of clinical training in hospitals. Students’ difficulty transferring what they learn in the classroom to the practical setting, however, has lead to years of effort to try and integrate the basic and clinical sciences, but with no major change to curricula being realized. What may be contributing to the ongoing struggle to integrate is the tendency of the medical education community to focus on the level of curricular structure when challenges more often concern the struggles of individual educators dealing with change. In order to bring light to the level of individual teachers the objective of this study was to use a phenomenological approach to understand what it was like for basic scientists (specifically anatomists) to transition to an integrated curriculum, and how the change impacted their teaching.

Lillian Douglas School of Medicine (pseudonym) was used as a case study of an anatomy course that has successfully transitioned to an integrated curriculum. The primary investigator spent five weeks with the program during which she interviewed participants, observed lectures, seminars, and labs, and collected relevant documents Data was analyzed using the reiterative cycle of hermeneutics.

The experience of transitioning to an integrated curriculum was like moving to a foreign country in that participants left the “home” and familiarity of their previous teaching, and took on the work of learning a new clinical language. Explanatory concepts characterizing the experience of basic scientists transitioning to an integrated curriculum included shifting from teacher-centered to student-centered teaching, adopting a “beginner’s mind”, maintaining control, and identity transformation.
Implications for basic scientists include factors that may enable the transition to an integrated curriculum such as adopting an open mindset and being aware of how educators’ roles and identities may change in the new curriculum. Implications for leaders of reform include ways they might support basic scientists undergoing change such as facilitating collaboration between basic scientists and clinicians, as well as implementing strategies aimed at enhancing basic scientists feeling of control.
Preface

I developed the conception and design of this study with guidance and input from my two PhD supervisors Dr. Dan Pratt and Dr. Glenn Regehr. Fieldwork and data collection were carried out by myself. Dr. Pratt and Dr. Regehr were involved in the early stages of data analysis with the reading of observation notes and transcripts while I was in the field. I completed the coding of data, and Dr. Pratt and Dr. Regehr were again involved in the later stages of data analysis in reading and providing feedback on my continued writing.

A version of chapter 1 has been accepted for publication. Hopkins, R., Bowen, J., Pratt, D., Regehr, G. Integrating basic science without integrating basic scientists: Reconsidering the place of individual teachers in curriculum reform. *Academic Medicine*. I wrote most of the manuscript with feedback and revisions from my two PhD supervisors as well as Judith Bowen, a member of my supervisory committee.

Approval for this study was attained from The University of British Columbia Behavioral Research Ethics Board (UBC BREB). The project title as read on the certificate of approval is “Integration in medical education: Basic science educators’ experiences of change”. The UBC BREB number is H12-01603.
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Dedication

To my parents,
James and Vivian Hopkins
Chapter 1 – INTRODUCTION

Overview

In recent conversations about curricular change in medical education, there is a resounding call for integration of the basic and clinical sciences. However history shows that, like other concepts related to curricular reform, integration has been continually revisited, leading to incremental change but no meaningful transformation. To redress this cycle of "change without difference", it is necessary to re-examine the approach that dominates medical education reform efforts, and to explore alternative perspectives that may help to resolve the cyclical "problem" of integration. In order to provide a different perspective on implementing integration this chapter looks to how the field of educational change approaches the transitions that occur within complex and evolving environments. I will start the chapter by looking at the context of medical education with respect to integration and curricular reform. Then I will trace a historical roadmap of integration in medical education and reflect on how themes of curricular reform have tended to resurface over the past century. I will then explore the educational change literature and lastly use the way this domain approaches change as a lens to see how strategies to integrate curricula in medical education might be lacking, and to discern what research questions may help fill that gap.

Context of medical education

Medical education is in a state of transition. National recommendations are being published, curricula are being revised, and schools and educators are responding. A major challenge being addressed in this wave of reform is the historical segregation of foundational knowledge and clinical practice. The predominant curricular model of the past 100 years is one in which students spend two years in the university setting learning the medical, or "basic"
sciences, and then two years in teaching hospitals learning at the bedside of patients. Originally described by Flexner (1910), this segregated structure has withstood over a century of curricular reform. However, this separation of theoretical and practical knowledge is now perceived as problematic because, firstly, it is seen to weaken the transfer of knowledge to the practical context, and secondly, in the first two years students of training are often unmotivated to learn large amounts of detail that seems disconnected from the practical setting (Bowe, Voss, & Thomas Aretz, 2009; Grande, 2009; Pawlina, 2009; K. Smith, 2010; Spencer, Brosenitsch, Levine, & Kanter, 2008; Wilkerson, Stevens, & Krasne, 2009).

The commonly espoused solution to this segregation is curricular “integration” (Cook, Irby, & O’Brien, 2010). Integration is conceptualized and used differently across the medical education literature (Martimianakis, Whitehead, Webster, & Mylopoulos, 2012). The type of integration I am referring to in this study is the bringing together of clinical science, the practical application of medical knowledge, with the teaching of basic science, the subject areas contributing to fundamental medical knowledge such as anatomy, physiology, biochemistry etc. In medical education the promise of integration is that if the basic sciences are taught in a way that is relevant to the context of medicine it will: 1) improve students’ retention of knowledge, 2) improve the transfer of knowledge to the clinical setting, and 3) sharpen students’ interest by allowing them to see the relevance of basic science content to clinical practice (Dahle, Brynhildsen, Fallsberg, Rundquist, & Hammar, 2002; Muller, Jain, Loeser, & Irby, 2008).

The concept of integration is not new. Manifested in different curricular structures, integration has been a recurring theme throughout the history of medical education reform. Despite being reiterated in recommendations for change and in spite of continued efforts to bring together foundational knowledge and clinical practice, for the most part the implementation of integration has remained a challenge (Boudreau & Cassell, 2010).
In order to move forward in implementing integration, a relevant question to ask is why this perpetual discussion of the same theme has continued in medical education for over a century with little substantial change in the training of physicians? To help address this question, I will first take note of where medical education has already been by exploring the history of integration in medical education.

**Integration then, and (still) now**

The field of medical education has been working towards integration for over 60 years. For example, Case Western Reserve School of Medicine is recognized as implementing the first integrated curriculum in the early 1950s as lectures began to incorporate clinical examples or include presentations from visiting physicians (Papa & Harasym, 1999). Later McMaster University moved towards integration with the introduction of Problem-Based Learning (PBL) in 1969. One of the expressed objectives of this innovative curriculum was to integrate the basic and clinical sciences in the context of clinical problems (Neville & Norman, 2007). Similarly, the University of Calgary Faculty of Medicine introduced a curriculum in the early 1990s where relevant basic and clinical science material were to be learned in the context of “clinical presentations” - the different ways patients present to physicians such as headache, abdominal pain, or fever (Papa & Harasym, 1999). Thus, in the context of different schools and in the form of different curricular structures, integration was a recurrent theme of reform throughout the second half of the 20th century (Enarson & Burg, 1992).

Yet, today, integration remains unresolved, and continues to appear as a central recommendation in reports for curricular reform. The *Future of Medical Education in Canada: A Collective Vision* (FMEC report), acknowledges the integration and timing of the basic and clinical sciences as one of the priority areas to be addressed in the training of physicians in Canada (AFMC, 2010; Hodges et al., 2011). Specifically, the report recommends that “both human and biological
sciences must be learned in relevant and immediate clinical contexts throughout the MD [medical doctor] education experience”, and that the basic and clinical sciences “must be increasingly integrated so that students think about clinical applications as they learn basic sciences and about scientific principles as they learn clinical skills” (AFMC, 2010, p. 20). Similarly, Educating Physicians: A Call for Reform of Medical School and Residency recommends integration of formal knowledge and clinical experience (Cook, et al., 2010). A commission on medical education sponsored by the Robert Wood Johnson Foundation recommends that “medical schools should ensure that the sciences of medical practice be integrated throughout the entire course of study” (Marston & Jons, 1992, p. 413; Whitcomb, 2006). In Europe the General Medical Council suggests in their report Tomorrows Doctors that the basic sciences should be spread right across the course of medical training ("General Medical Council," 2009). Recommendations to integrate are not only pervasive in conversations regarding the reform of medical education in general, but also discussions specifically addressing the teaching of basic science. Although there is much debate over defining the “best” way to teach basic science, reformers seem to agree that basic science education should be integrated throughout the entire medical program. A recent study led by the International Association of Medical Science Educators (IAMSE) to investigate the role and value of basic science in medical education found that a common theme across focus groups was “the importance of teaching basic science content that is relevant to clinical practice, and that such teaching should occur across the entire UME [Undergraduate Medical Education] experience and be integrated with clinical applications” (Finnerty et al., 2010, p. 355) (emphasis in original).

Thus, it appears that over 60 years after Case Western’s first effort at bringing the basic and clinical sciences together, educationalists are still espousing and working toward the same goal - integration. Given the frequency of calls for integration Kulasegaram et al. conclude that the concern for integration “has not abated over time”, and “is not a solved problem” (Kulasegaram, Martimianakis,
Mylopoulos, Whitehead, & Woods, 2013, p. 1578). It seems appropriate therefore, that Boudreau has posed the question, “why [has]…the urge to seek integration been so persuasive, and the solutions so intractable?” (2010, p. 382).

**The curricular “carousel” of medical education**

Integration, of course, is not the only curricular reform effort to experience this recurring and ongoing discussion. Sociologist Bloom was one of the first to note that despite medical educators’ frequent implementation of curricular reforms, the teaching and learning experience of medical students has remained remarkably similar (1988). After reviewing major reports of reform throughout the past century Christakis came to a similar conclusion finding that “typically these reports identify strikingly similar problems with medical education, claim that previous reports have gone relatively unheeded, argue that reform is essential and urgent, and prescribe corrections that are also strikingly similar” (1995, p. 706). Similarly, in analyzing the language medical educators use to describe these recurring calls for change in the literature, Whitehead et al. use the metaphor of a carousel, with the returning themes of curricular reform being pictured as ponies coming around, and around again in medical education (2012).

It is acknowledged that modifications and adjustments have been occurring constantly in order to keep up with the advancement of medical science and technology, but these changes are described as being superficial, leaving the basic and clinical sciences still largely segregated (Bloom, 1988; Finnerty, et al., 2010; Weatherall, 2006; Whitehead, et al., 2012). The consensus appears to be that, although changes have occurred, they remain at the level of curricular “tinkering” (Ludmerer, 1999) rather than producing fundamental change. Skochelak affirms our tendency to “tinker” in her review of reports calling for change in medical education over the past decade (2010). Her findings show that the same themes are discussed repeatedly with no more than incremental
change over the past ten years. Her claim, which has been echoed by others in the medical education community (Raszka & Bannister, 2011), is that medical educators have thoroughly identified and contemplated the problems facing medical education. She notes that “we can be assured that we don’t need to keep asking, ‘what should we do?’ but rather ‘how can we get there?’” (Skochelak, 2010, p. S32)

I would suggest however, that in order to answer this question of how to get there, it is first necessary to ask why change has been so hard? In order to address this question, and in hope of informing the quest to more effectively integrate the basic and clinical sciences in medical education curricula, I will now look to a domain that is also dealing with large scale change - the broader field of education. Gaining insight into how this area of literature approaches change may help the field of medical education get off the curricular “carousel” of integration.

**Educational change**

Educational change is a broad term referring to reform efforts in education. The context of educational change is similar to that of medical education in that there is ongoing concern expressed regarding the limited impact of reform efforts despite the large amount of resources devoted to it (Gess-Newsome, Southerland, Johnston, & Woodbury, 2003; S. A. Southerland, Sowell, & Enderle, 2011). Commonly referred to as the “paradox of change without difference” (Woodbury & Gess-Newsome, 2002), this phenomenon describing the lack of impact of educational reform largely echoes the resurgence of the same recommendations for reform throughout the history of medical education.

The educational change literature highlights the importance of different levels of the system during reform. “Levels” include a teacher in her classroom, the school she works in, the school district, as well as local and federal governments
(Fullan, 2007). In medical education, one level of change involves individual educators: the basic scientist teaching in a university or the clinical instructor guiding learning in a clinic or on the wards. Each of these individuals is a member of a department or faculty, which is then embedded within the larger medical school. The medical school is most often housed within a university and is associated with teaching hospitals. These are under the authority of provincial or state educational and health care systems. Michael Fullan, one of the leading scholars in educational change, points out that when these various levels of change are working at cross-purposes, change is likely to fail (2007). Fullan notes that “a teacher cannot sustain change if he or she is working in a negative school culture; similarly, a school can initiate and implement successful change, but cannot sustain it if it is operating in a less than helpful district; a district cannot keep going if it works in a state that is not helping to sustain reform” (2007, p. 18). It is also worth noting that a growing (but still nascent) body of literature on the scholarship of curriculum practice in higher education highlights an additional level of change agent involved in effective program change in multidisciplinary settings: the curriculum/program leader who is often responsible for directing the program change and functions as an interface between the institutional leaders and the teachers on the ground (Beaudoin, 2012; Bryman, 2007; Richlin & Cox, 2004; Saunders, Trowler, & Bamber, 2011).

In addition to recognizing that interrelated levels of change must be addressed for successful reform, the educational change literature draws particular attention to one of those levels – individual teachers. One of the most established notions in this area of literature is the importance of focusing on teachers themselves. In her review of educational reform, Woodbury found substantial evidence that the thinking and practice of individual teachers centrally impacts educational change (2000). Researchers in educational change largely agree that any attempt to significantly change curricula must start with teachers (Bailey, 2000) and continue to hold them at the center (S. Southerland, Sowell, Blanchard, & Granger, 2011a).
Although importance is placed on individual teachers, researchers in this field share the assumption that educational change is not entirely an individual, psychological process (Richardson & Placier, 2001). As Fullan notes, “this is not just an individual problem, it is a system problem” (2007, p. 153), and there needs to be a balance between the individual and the collective (Fullan, 1993). Datnow and Stringfield emphasize the importance of addressing both the level of teachers and broader systemic levels of change (2000). They explain, “reform adoption, implementation, and sustainability, and school change more generally, are not processes that result from individuals or institutions acting in isolation from one another. Rather they are the result of the interrelations between and across groups in different contexts” (Datnow & Stringfield, 2000, p. 199).

Given the complexity of multiple levels of change it is not surprising that what the field of education finds challenging is being able to attend to both individual teachers and systemic structures during periods of reform. In fact the two largely represent different areas of literature within educational change that are for the most part uninformed by each other (Richardson & Placier, 2001). According to Fullan, focusing solely on the individual tends to over emphasize the personal and disregards context, while only heeding the level of the school system moves the conversation away from teachers resulting in recommendations that have a tendency to be too structural and bureaucratic (1993).

The educational change literature brings an illuminating perspective to the “carousel” of efforts in medical education to integrate curricula. Although this area of scholarship emphasizes the need to address multiple levels during times of change, including both educators and systemic structures, it highlights the level of individual teachers as a key aspect of the change process. As summarized by Fullan, “educational change depends on what teachers do and think - it’s as simple and complex as that” (p. 129).
Emphasis on curricular structure rather than individuals

In contrast to the educational change literature, the literature regarding the implementation of integration in medical education tends to focus at the level of curricular structure, with Irby and Wilkerson identifying integrated curricular structures as one of five environmental trends in academic medicine (Irby & Wilkerson, 2003). Medical schools reporting their experience of implementing integration outline curricular design features along with figures illustrating the structure of different courses, blocks and their relationships to one another (Dahle, et al., 2002; Wilkerson, et al., 2009). They explain how their curriculum was developed and how various content areas and themes are organized. For example, in describing the efforts of eight schools implementing integration, Schmidt uses the structural language of “architects” of new integrated courses, and “blueprints” for new curricula (1998). In their review of studies documenting their approaches to integration, Kulasegaram et al. note how integration is often characterized by how components of the curriculum have been rearranged or aligned (2013).

Amidst the overlying conversation regarding various integrated structures, the voices of individual educators, and in particular those of basic scientists, appear to be lost. When stakeholders are addressed in these descriptions, they mostly include groups who have already “bought into” change such as the leaders of educational reform, students who are taking an active role in curricular change activities, and directors of newly integrated courses (Muller, et al., 2008). In other studies the faculty and administration whose perspectives are gathered regarding integration are all from the clinical specialties rather than the basic sciences (Tresolini & Shugars, 1994), or represent only the perspective of high-level administration (Anderson & Kanter, 2010). With respect to the integration literature Kulasegaram et al. note the “largely absent consideration of sociocultural factors such as attitudes toward the importance of … basic scientists” (2013, pp. 1581-1582). When educators, including both basic
scientists and clinicians, *have* been included it is by means of a few questions on a Likert-scale questionnaire (Brynhildsen, Dahle, Behrbohm Fallsberg, Rundquist, & Hammar, 2002).

Despite the seemingly muted voice of basic scientists in the integration literature, one challenge often mentioned with respect to implementing integrated curricula is resistance from the basic sciences. In general, basic scientists are reported as having a negative attitude toward change. Different schools’ accounts of implementing integration point out the unwillingness of basic science faculty to adapt to a new curriculum (Bowe, et al., 2009; Muller, et al., 2008; Schmidt, 1998). Some report that basic scientists perceive integration to be unidirectional (McCrorie, 2000, p. 594), and that they are uncomfortable trying to put their teaching into clinical contexts because of their lack of clinical knowledge (Pawlina, 2009). When forced to integrate, basic science departments are noted as displaying “anxiety, antipathy, lack of cooperation, and general mistrust” (Sweeney, 1999, p. 15).

Thus, in conversations about integration in medical education there seems to be a disconnect between how the field talks about change and the challenges they are having implementing it. The focus appears to be on the organization and structural level of the curriculum. However, struggles do not appear to be related to curricular design but rather to factors associated with the level of individual educators, mainly their perceived resistance to change. In addition, although being labeled as resistant to reform, the perspective of basic scientists and their experiences of change are largely missing from the literature.

**Objectives**

It seems that in medical education when addressing Skochelak’s challenge of “how we get there” in curricular integration, we tend to focus on the organizational structure of the curriculum, when the challenges we are having
more often concern the struggles of educators having to deal with change. When addressing the challenge of curricular integration, therefore, moving forward will likely require not only focusing on curricular structures, but also attending more fully to the individuals involved in the change. In particular, the basic scientists who will be directly involved in enacting the new curriculum will have to be part of the solution.

To this end, a meaningful avenue of research might be to focus on better understanding the experiences of basic scientists who are at different points along the process of reform. What is it like for those who have undergone, are undergoing, or anticipate such a change? How do they understand the teaching of basic science within this new mandate of “clinical relevance”? What learning must occur in order for them to get there? What do they feel they have to give up in this process? Understanding what integration means for individual basic scientists at these different stages of change will allow us to better anticipate and address tensions arising in future attempts of reform. It will also inform the structural systemic changes needed if we are to support individuals undergoing these transitions. Thus, it will allow us to make more informed decisions throughout the process of reform.

The aim of this study is to address one of the aforementioned stages along the process of reform by focusing on the experience of basic scientists who have already undergone the transition to an integrated curriculum. Specifically, this study will focus on the experience of a particular group of basic scientists that teach within the medical curriculum – anatomists. The teaching of anatomy in medical education is a clear example of curricular segregation. In many programs, students first learn anatomy from basic scientists in the university setting, followed by training alongside physicians in a clinical context. The current mandate is for anatomists to transition to teaching anatomy in a way that is relevant to the work of clinicians. But shifting towards a more applied focus requires what amounts to a shift in the practice and pedagogy of basic scientists.
For example, in terms of curricular structure, anatomists organize the body into different regions and systems in order to teach students, whereas physicians arrange their understanding of the body around the fluctuating needs of patients. Both are legitimate ways of organizing anatomical knowledge, but competence in one form of understanding does not necessitate understanding in the other. In terms of pedagogy, basic scientists often view their role as the teaching of the content of a discipline, while physicians view their roles as fostering the use of knowledge in context. Thus, in order for anatomists’ teaching to be valued within an integrated curriculum, they must re-define how they conceptualize and teach their discipline. As exemplified by the educational change literature, fostering integration will need to focus not only at the level of curriculum planning, but also on the change processes used to support those who will be teaching. In order to bring attention to the individual level of change as Fullan suggests (2007), it is crucial to ask those who have made the transition to integrated curricula how the mandate for practical relevance has impacted their understanding and teaching of anatomy. Building from my own experience as anatomy educator, this study focuses on the foundational science of anatomy in order to better understand what it is like for basic scientists to change to an integrated curriculum and how it has impacted their teaching. As such, my research questions are: 1) what is the experience of anatomists transitioning to teaching within an integrated curriculum? and 2) how did those transitions affect their teaching? The goal of this study is not to try and portray an “ideal” example of integration that medical schools should aspire to attain, or to determine the appropriate steps to “successful” integration. Rather the intent is to explore and learn from the experiences of those who have undergone this type of transition to an integrated curriculum in order that we might learn from what they went through as we approach these changes ourselves.
Summary

Current reforms in medical education reiterate many of the same challenges the field has been voicing for over half a century: the divided structure of the medical curriculum, the perceived lack of relevance of basic science material as currently delivered, and the lack of students’ retention and application of this material in clinical practice. The approach to addressing these concerns is also nothing new with curricular integration of basic science and clinical knowledge residing as a central recommendation in the most recent reports on reform and in many papers in the medical education literature. It has been suggested that medical education must move beyond the question of what is needed, to the question of how best to get there. However, I would argue the key to this challenge lies in the question of why after years of reiterating the need for and working towards the goal of integration is the medical education community still trying to find traction on implementing change? The educational change literature speaks to the importance of attending to the multiple levels of change, but in particular to the individual teachers that will be implementing change. Given the complexity and collaborative nature of educational reform, I suggest delving beneath the models of curricular structure that dominate current conversations about integration, and developing an understanding of what those curricular changes mean to those who are asked to live them and carry them out. Towards this end, the objective of this research is to better understand the experience of basic scientists, specifically anatomists, who have made the transition to teaching within an integrated curriculum. Focusing attention not only on what is being integrated, but also on who is being integrated may be the key to moving beyond change without difference, and enacting change that is both successful and meaningful.
Chapter 2 – METHODOLOGY

Overview

This chapter is an articulation of my research approach and a negotiation of my position as a researcher. It represents how I have reconciled my beliefs and research goals with the nature of what it is I wish to study – individuals’ experiences of the world. Similar to Smith et al. (2009), my intention was to develop a framework that practitioners and researchers can use to understand what something is like from the perspective of those who have lived through it. The chapter will describe how I have operationalized a range of philosophical ideas that resonate with both my concern for the teaching of basic science, and with my beliefs and voice as a researcher. I will start by introducing the field of phenomenology – the study of experience. This will include marking the common ground that all phenomenologists agree to stand on, as well as addressing the question of why someone would choose to use a phenomenological approach. I will then introduce a framework that is made up of three dimensions, or inevitable tensions, that one must deal with in doing phenomenology. These include tensions between the general and the particular, reduction and reflexivity, and description and interpretation. Throughout the chapter I will share my own negotiation of these tensions, ultimately describing my own approach to phenomenology and providing a framework for other practitioners and researchers to be able to do the same. Lastly, I will explore a fourth aspect of phenomenology that is integral to this research approach but rarely made explicit – the process of writing. In light of the three dimensions plus the process of writing I will refer to the model as the “3+1” phenomenology framework (Figure 2.1).
Figure 2.1 – Overview of the 3+1 phenomenology framework. The 3+1 phenomenology framework is made up of three axes which represent the inevitable tensions phenomenologists must negotiate in their work. Writing, the “+1” dimension, is how phenomenologists go about dealing with the three tensions, and as such is represented in the model as subsuming them all (grey shaded area).

I will note later, but it is worth mentioning here, that although the dimensions of the framework appear polarized at either ends of a spectrum, this is by no means an effort to try to compartmentalize or categorize researchers’ thinking about phenomenology, or to suggest that one must locate themselves on a line between the two. As such, as I explain my philosophical stance throughout the chapter I have chosen not to position myself diagrammatically as a point along each of the dimensions. This is to emphasize that there is fluidity amidst the differing perspectives of each dimensions. This fluidity allows researchers to oscillate along each axis depending on the nature of the phenomenon being studied and at different stages of the research process. I will position some
philosophers as specific points along each axis based on the approaches they have espoused in their discussions of phenomenology, but these are to serve as examples to illustrate the spectrum of each dimension, not to suggest that, as researchers, they stand firmly at this point throughout their research activity. As phenomenology is a diverse field with rich multifaceted philosophical roots, my aim is to provide a language and structure that will allow others to consider how their beliefs and goals might align or not align with some of the predominant perspectives in the field, not to suggest that there is a specific or correct point at which to locate themselves along an axis. Use of the framework will be discussed in further detail prior to the description of each dimension.

The nature of phenomenological “problems”

The context of curricular reform is complex. As discussed in chapter one it involves multiple levels; from individual educators to entire universities, school districts, and governments. Problems arising in this type of context tend to stem from the bringing together of professionals with different perspectives, roles, and objectives within the school system or organization. These tensions have to do with our human nature, our individual perceptions and our interactions with others. They cannot be “solved” or verified by experiments as in the natural sciences. Basic scientists, clinicians, and administrators, for example, all have their own unique perspectives that are a result of their enculturation to their field, their previous experience, and the beliefs and values that guide their work. Each of their perspectives is “correct”, representing different vantage points for seeing and experiencing integration. When there is no objective “truth” to be found, dealing with these tensions more appropriately involves understanding the perspectives of individuals involved in implementing change rather than searching for the “right” way to integrate. As summarized by Dilthey (1976), “we explain nature, but human life we must understand” (in van Manen, 1990, p. 4). An approach to research that allows us to understand the unique perspectives of individuals is phenomenology.
What is phenomenology?

Often when we want to learn about something, be it a place we are going to travel or a restaurant we want to visit, we take initiative to talk to and learn from others who have already experienced those things. Similarly, a patient who is just diagnosed with cancer can learn about the treatment he will have to go through from the stories of survivors, and a second year medical student can learn about what clinical rotation will be like through the experience of her friend who is currently on that rotational assignment. Thus, when we want to learn more about a certain thing or place we often look to the experience of others. Broadly speaking, phenomenology is an approach to research that turns to people’s experiences in order to better understand something.

Phenomenology is first and foremost, an evolving *philosophical* stance or approach (McConnell-Henry, Chapman, & Francis, 2009; Ray, 1994; van Manen & Adams, 2010). Importantly, it is not *one* approach but many. As described by Smith et al. (2009), “phenomenology can be seen as the joint product of a number of related but distinct philosophers” (p. 34). Although originating in the rich historical field of philosophy, van Manen (1990) notes that “this does not mean … that one must become a professional philosopher in an academic sense” (p. 7). It does, however, mean that one should understand and carry out research in a way that is consistent with the phenomenological approach in which one chooses to stand.

Phenomenology is not prescriptive in the sense that there are no specific procedures or steps to conduct research. Many different data collection techniques such as interviews and observations are used within each phenomenological approach (Finlay, 2009). In short, phenomenology is grounded in the work of many philosophers who think differently and has no prescribed steps to follow. No matter what philosophical stance an investigator
takes, however, there is some common ground on which all phenomenologists
stand; the study of experience, and a “phenomenological” attitude.

**Phenomenology’s common ground**

Although phenomenologists have different philosophical stances, they all hold at
the center of their work the aim of exploring experience. More specifically, they
try to understand what concepts or phenomena *mean* by investigating people’s
experiences of them. A quest for “meaning” tends to sound like an elusive and
lofty goal. In a sense we all search for meaning in that we all have an innate
desire to make sense of what is going on. For example, think of the last time you
saw a really strange movie and needed to ask the person next to you, what was
that about? Meaning, as I have come to understand it in the context of
phenomenology, is the significance something holds for us, or how we have
come to understand something as a result of our enculturation or through a more
explicit process of trying to make sense of it.

Take love for example. How would you respond if I asked you what does love
mean? Although most of us commonly understand love to be affection for a
spouse, partner, family member or friend, we use the word in many other
contexts; I would really love a cheeseburger right now, I love spending time with
my grandchildren, or I would love to go for coffee with my mom. In each of these
contexts are we talking about the same “love”? In other words does love *mean*
the same thing or have the same significance in each of these instances? I
assume most would agree that what you mean by “loving” your wife or husband
is different than your “love” for cheeseburgers. Because love can imply different
things in different contexts from the perspectives of different people it makes it
difficult to put into words exactly what loves *means*. Despite this difficulty,
however, you may be able to talk at length about how your heart jumps when you
hear the garage door open at the end of the day as you anticipate your partner
coming home, the comfort and security you feel when you are in her arms, or the
contentment and joy you have to just be silent in her presence. In other words, although it is difficult to narrow love into a single definition we can come to a better understanding of what it means by hearing people talk about their own experiences of love. The same can be applied to questions such as, what is it like to lose a mother? What is it like to live with AIDS? Or (in the context of this study) what is it like to transition to an integrated curriculum? Phenomenology is not going to solve the “problem” of integration, but we can come to a better understanding of what it means to integrate by asking those who have lived through it what their experience was like. This commitment to experience is a common thread that weaves throughout all phenomenological work.

Another commonality amidst the field of phenomenology is the need to adopt a certain attitude - a “phenomenological” attitude. To elaborate this idea we might use the concept of time. Although we are constantly aware of the time as we move throughout our day, we rarely stop to reflect on what our concept of time is. Phenomenologists call this state of mind the natural attitude; our mindset as we take for granted the everyday activities we are so habituated to. In other words, our everyday experience is so commonplace that we usually do not notice it (Zichi-Cohen & Omery, 1994).

For the most part, our natural attitude is not a problem. Taking our concept of time for granted does not get us into trouble because the majority of people in our context have the same understanding of what time means. The transit system keeps the same schedule, students know when they are supposed to be in class, and you can reserve a table at a restaurant and have it ready for you when you arrive. It is when individuals have different concepts of time that our taking for granted of what it means tends to be problematic. For example, when I was working at a nursing station in Ethiopia we offered monthly vaccination clinics which involved driving to remote villages to provide medication for women and children. Despite coordinating a start time with the locals, every clinic we put on involved having to wait two or three hours for people to show up. Month after month I was continually frustrated at how long we would wait regardless of
organizing the timeframe of when the clinic would run. My frustration was a result of me not understanding that the African tribes we were providing care for have a completely different framework for thinking about time that is rooted in their culture and beliefs. My perception of them being two hours late would have been “on time” to them. Thus taking for granted my previous experience and understanding of time was a source of tension when trying to coordinate with people holding a different idea of what time means.

Phenomenology involves turning to and reflecting on these taken-for-granted understandings, or as stated by Rehorick and Bentz (2008) to “become aware of what we have learned to ignore” (p. 6). A phenomenological attitude involves attentively reflecting on our everyday experiences so that we might make sense of them. As noted by Giorgi and Giorgi (2003), “when we encounter familiar objects we tend to see them through familiar eyes and thus often miss seeing novel features of familiar situations” (p. 249). Thus when we shed our usual inattentiveness, our natural attitude, and stop to consciously reflect on what we normally take for granted we are taking on a phenomenological attitude.

**Why phenomenology?**

In considering the application of phenomenological knowledge van Manen (1990) states that “the more important question is not: Can we do something with phenomenology? Rather we should wonder: Can phenomenology, if we concern ourselves deeply with it, do something with us?” (p. 45). In other words, we inquire into people’s experiences because they allow us to become more experienced ourselves (van Manen, 1990). If we better understand the experience of anatomists transitioning to teaching in an integrated curriculum we will, on the basis of that understanding, be able to make more informed decisions throughout the process of reform. In sum, phenomenology helps us understand what we normally take for granted and through this understanding we are able to think and act more tactfully in certain situations (van Manen, 1990).
3 + 1 phenomenology framework

To summarize to this point, phenomenology is used to understand something – a phenomenon – through people’s experiences of it. It is not a method with a series of procedural steps, but rather a philosophical stance or approach. It is also not a unified viewpoint but rather includes the philosophical ideas of many. Despite the collective contribution from multiple scholars there is some common ground on which phenomenologists stand including the concern for studying people’s experiences, and that understanding what these experiences mean involves deliberately reflecting on and paying attention to what we normally take for granted.

Nonetheless, there are differences that have resulted in certain tensions in the field. I will now turn to explaining the 3+1 phenomenology framework by introducing each of the dimensions that represent these tensions. Although my ultimate objective in this section is to articulate my own positionality with respect to phenomenology, my hope is that this framework will also be a useful tool that scholars and practitioners can use in grounding themselves philosophically before pursuing phenomenological inquiry.

I am referring to this framework as “3 +1” as it includes three dimensions, or tensions, within the field of phenomenology, plus one aspect of phenomenology that overlays and runs within them all – writing (Figure 2.1). Within each of the three tensions there are opposing perspectives, but as previously mentioned my intention is not to segregate or compartmentalized the work of phenomenology. For the sake of creating a visual aid to help conceptualize the different lenses used to think about phenomenology these perspectives have been placed at opposing ends of an axis. This is not to suggest that as a phenomenological researcher you must position yourself at some point between the two being more or less like one or the other. Rather, this framework is intended as a tool to help describe the diverging perspectives within the field and to provide a language
researchers can use to articulate how they are choosing to negotiate their position with respect to each of these tensions. A researcher’s position will depend on her questions, context, and beliefs. Throughout this section I will provide examples of philosophers and scholars who have operationalized phenomenology in their particular discipline in order to give a sense of the diversity of thought and perspectives within the field. I will also share how I have negotiated these tensions with respect to my beliefs as a researcher and my goals for this particular study. The first dimension starts where phenomenology itself started, with the work of Edmund Husserl.

The general and the particular

Edmund Husserl is phenomenology’s founding father. The goal of his work was to determine the essence of phenomena through people’s experiences of them. A phenomenon’s “essence”, or essential structure, is its universal, unchanging, and absolute features (Walters, 1995). Essence includes the features of something that make it what it is and differentiate it from other, perhaps similar, phenomena. In other words, essence is what is common or can be “generalized” across every instance of a phenomenon. For example, what is it about teaching that makes it teaching? Must there be a teacher delivering information to students? or a mentor demonstrating a skill to an apprentice? If you asked different people about their experience of teaching, what characteristic(s) would be essential across those responses? What would emerge as imperative to the teaching of that subject to those learners? Husserl’s phenomenological approach is considered nomothetic in that it aims to move from individual instances to establish a universal meaning, or essence, that can be applied to all humans (J. A. Smith, et al., 2009).

More recently, however, some phenomenologists have moved away from Husserl’s more universal goal of essential structure to adopting an approach that is concerned with individuals’ particular experiences. In operationalizing
phenomenology in the field of psychology Smith et al. (2009) have taken an *idiographic* perspective to studying peoples’ experience. A project that is idiographic is focused on the particular – the experience of certain people within a specific context. For Smith et al. this is exemplified by the goal of understanding in great detail the meaning of each individual’s experience. To honor this priority to the particular, idiographic studies tend to have a smaller number of participants in order to allow greater depth of analysis.

Although depicted in Figure 2.2 as being on opposite ends of a spectrum, Smith et al. (2009) remind us “that the particular and the general are not so distinct” (p. 31). To some extent all phenomenologists engage in both the general and the particular. Even Husserl’s search for a generalizable “essence” needed to start with the particulars of people’s experiences. Smith et al. (2009) explain that “at the deepest level we share a great deal with a person whose personal circumstance may, at face value, seem entirely separate and different from our own. Thus in some ways the detail of the individual also brings us closer to significant aspects of the general” (p. 32). van Manen (1990) adds that “phenomenology is neither mere particularity, nor sheer universality” (p. 23). As details are what make up a greater whole, and the whole is a reflection of its parts, the negotiation of particularity versus generality is not an either/or question. The opposing perspectives within the dimension of the general and the particular, then, have to do with the goal of the researcher and what claims they wish to make. The objective of scholars ascribing Husserl’s approach such as Giorgi (1997) and Moustakas (1994) seek to emphasize the commonality of people’s experiences thus locating themselves towards the “general” (Figure 2.2). On the other hand, although Smith et al. (2009) do move towards making more general claims they are ultimately committed to what particular experiences are like and what they mean to particular people. Thus, to some degree there is a movement between the general and the particular in all phenomenological work, although some, like Husserl, choose to foreground the general “essence”, and others such as Smith et al. choose to emphasize the particular (Figure 2.2).
Husserl’s approach (later adopted by Giorgi and Moustakas) is to determine an “essence” that can be generalized to anyone who has experienced a certain phenomenon. Alternatively, Smith et al.’s goal is to foreground the detail of a particular individual’s experience.

The goal of this study was to understand in detail the experiences of a particular group of anatomists, and as such, my phenomenological approach was idiographic. More general themes were still drawn from participants’ stories, but my ultimate commitment was attending to a greater depth of detail for each participant’s circumstances and to understanding how particular anatomy instructors in a particular school and in a particular program experienced the transition to an integrated curriculum. This focus on the particular is in concert with my belief that every participant’s account represents a different truth, as each of their experiences is embedded in their own unique background and context. My objective was not to determine one fixed meaning of the phenomenon of integration. Thus, it was my priority as a researcher to attend first and foremost to their particular experience.

**Reduction and reflexivity**

Having decided on an emphasis of the particular, another question I needed to ask myself was how exactly do I go about adopting a “phenomenological attitude” in order that I might see the experiences of basic scientists from a fresh perspective rather than through the taken for granted assumptions of my “natural
attitude”? And in relation to this, what exactly do I do with what I bring with me to this research in terms of my prior knowledge, assumptions and experiences? These questions are the source of tension along the next dimension of the phenomenology framework, reduction and reflexivity.

The dimension of reduction and reflexivity is a negotiation of what we do with all of our “baggage”. Not baggage in a negative sense, but rather what it is we carry or bring with us into a research study – our previous education, experiences, and beliefs. Some are a result of the choices we have made in terms of schooling and our career paths, thus being socialized into a certain field of thought. Others we have no control over such as where we were born or how we were raised. Whether an outcome of our choices or not, these things are inevitably part of who we are and affect how we see and understand the world. So when the call of phenomenology is to look at the meaning of phenomena with “fresh eyes” (Finlay, 2008a), what do we do with all of our previous knowledge and understandings? Before addressing this question it may be helpful to clarify that there are as many terms used to describe our prior assumptions, beliefs, and experiences as there are different phenomenological perspectives. Husserl’s “apperceptions”, Heidegger’s “fore-conceptions”, Gadamer’s “prejudices”, and Merleau-Ponty’s “implicit understandings” all similarly refer to that which we bring to our research. I am adopting Finlay’s (2008a) approach in that for the purpose of this study “pre-understandings” will be used as a general term that overlies the subtle distinctions between the language of previous philosophers. Using this terminology, our question then is how do we manage the pre-understandings we inevitably bring to research? And should they be managed at all?

Husserl’s perspective is that in order to study the essence of something you need to put all your baggage, or pre-understandings, aside. This process of researchers attenuating their prior understandings and assumptions as much as possible is a central tenet of Husserl’s philosophy, and is commonly referred to as the “phenomenological method”. Although referred to as a “method” it is
important to understand that the phenomenological method is a change in the mindset or attention of the researcher rather than a series of procedural steps. Husserl’s position is that in order to expose the true essence of people’s experiences it is first necessary for the researcher’s pre-understandings to be put aside. The process involves the researcher suspending her assumptions and pre-understandings so as to focus on the research participants’ experience. (Finlay, 2008b). In other words, we need to temporarily disengage from our “natural attitude” in order to see the phenomenon more clearly. As Husserl was originally a mathematician, the phenomenological method is synonymously referred to as bracketing, where the investigators pre-understandings are put to the side or in “brackets” as in a mathematical equation to be separated from other variables. Putting aside one’s pre-understandings is also commonly called phenomenological reduction where the field of the researcher’s attention is “reduced” to the phenomenon under study. Another regularly used term for the act of suspending our beliefs is the Greek word epoche. In short, phenomenological reduction is a change from the natural attitude to the phenomenological attitude, where preconceived ideas are put aside in order better focus on the essence of the phenomenon. The ultimate affordance of bracketing our pre-understandings is that it helps us to be open to whatever we might learn about the phenomenon rather than judging it by what we already know. As noted by Finlay (2008a) reduction helps us to “connect directly and immediately with the world as we … experience it – as opposed to conceptualize it” (p. 4). In other words, the putting aside of our pre-understandings allows us to be open to learning about something through the experience of it, rather than turning to generalizations or frameworks we already know.

Given Husserl’s mathematical background, bracketing was his attempt to objectify research findings and increase scientific rigor. Although he was striving to develop a way to study human experience, Husserl’s phenomenology essentially arose from the natural sciences where the objectivity of findings is considered the gold standard (McConnell-Henry, et al., 2009). Thus, Husserl’s
phenomenology retains elements of objectivism in that it makes a distinct separation between the researcher and what is being researched. What is “out there” (the phenomenon as experienced by the research participant), is presumed to be independent of us (the researcher) and knowledge is achieved when the researcher correctly describes, or mirrors, the phenomenon. Husserl positions the researcher as a detached observer of people’s experiences and bracketing is his way to “control” the influence of the researcher’s perspectives on the research findings. Husserl does not claim that phenomenological reduction will lead us to final “correct” conclusions (Spinelli, 2005), but that the process will increase the “validity” of our data that may be otherwise distorted by our preconceptions.

But does our prior knowledge and experience necessarily skew our perception of people’s experience? What if it helped us better relate to people thus improving our understanding of what they have been through? And is subjectivity really a contaminant of phenomenological study? The philosophy underlying these questions moves us away from reduction toward reflexivity and the beneficial use of our pre-understandings.

While those whose thinking is aligned with Husserl acknowledge their pre-understandings in order to put them aside, there are others who take account of their previous knowledge and assumptions in order to help them better understand the phenomenon under study. Most notably, Husserl’s student Martin Heidegger made a large distinction between his philosophy and that of his mentors in that he believed our pre-understandings are not to be put aside, but rather are an important part of coming to understand people’s experiences. Heidegger’s perspective is grounded on his assumption of the inseparable relationship between humans and the world (Koch, 1995). From his point of view an individual and the world co-constitute each other, meaning that we are constructed and shaped by the world while at the same time we in turn impact and transform the world we engage in. To Heidegger we are not just individuals
amidst and detached from a world of objects. Rather, we relate to, engage with, are shaped by, and shape the things around us. Heidegger referred to this inseparable relationship between human beings and the world as being-in-the-world, with the hyphens symbolizing the unity of subjects and objects rather than their segregation (Svenaeus, 2001; Walters, 1995). Thus, although Heidegger held a similar interest to Husserl in focusing on people’s experiences, his notion of individuals being-in-the-world, as opposed to Husserl’s understanding of individuals separated from a world of objects, is grounds for important differences between Husserlian and Heideggerian phenomenology. As Heidegger’s philosophy holds the view that a person and the world are co-constituted and inseparable, then a person must make sense of the world as they exist within it, rather than being detached from it. As such, Heidegger rejects Husserl’s idea of being able to bracket out our presuppositions and previous experiences in order to obtain a more objective view of phenomena.

Heidegger’s student, Hans-Georg Gadamer (1989) also believed that pre-understandings are an integral part of understanding stating that “all understanding inevitably involves some prejudice” (p. 270). From this perspective, a researcher’s subjectivity is not an undesired state, or something to control against and monitor for more trustworthy research (Glesne, 2011). Rather, pre-understandings are considered strengths that researchers can use to achieve better understanding. Researcher subjectivity has been encompassed within conversations of reflexivity – the noting, keeping tracking of, questioning, and sharing the ways we shape and are shaped by the research process (Glesne, 2011). Contrary to reflection, which involves thinking about something after it occurs, Finlay (2003) describes reflexivity as more of an immediate and dynamic process of “continually reflecting upon our interpretations of both our experience and the phenomenon being studied” (p. 108) . Thinking reflexively helps us understand the ways our pre-understandings influence the questions we ask, the methodology we choose, what we observe in the field, how we engage
with participants, the interpretations we make, and the composition of our findings.

The question for me as I engaged in trying to understand the experiences of anatomy educators was should I put aside all of my own knowledge and experience as a teacher of anatomy? I agree with Finlay (2008a) in that the answer to such a question is both yes and no. Yes in that as a researcher I think it is important to attend to the influence of my pre-understandings in order to foster an attitude of openness to learning about participants’ experiences rather than my vision being narrowed by my own theoretical and experiential lenses. At the same time my characteristics, values and assumptions are so habitually engrained that it seems impossible to truly set them apart. As stated by philosopher Merleau-Ponty (1962), the “most important lesson which the reduction teaches us is the impossibility of a complete reduction” (p. xiv). van Manen (1990) shares similar sentiments in asking “how does one put out of play everything one knows about an experience that one has selected for study? If we simply try to forget or ignore what we already ‘know’, we may find that the presuppositions persistently creep back into our reflections” (p. 47). Despite the partiality of reduction in a complete sense, I believe that in order for me to appreciate the transitions basic scientists have gone through - as they have experienced it rather than how I have read about it - I needed to at least acknowledge what pre-understandings I brought to this study. This was not an effort to be more objective, but to enable me to discern the voices and perspectives of participants from my own. It would have been detrimental for me to put all my knowledge and experience in teaching anatomy aside as this is what allowed me to communicate in the language of my participants and empathize with their stories.

Thus, as I negotiated the tension between reduction and reflexivity (Figure 2.3), there was a movement between bracketing my pre-understandings in order to adopt an open phenomenological attitude, and reflexively taking note of what I
Figure 2.3 – Reduction and reflexivity. The goal of Husserl’s philosophy is to bracket out prior knowledge and experience, whereas Heidegger and Gadamer believe our pre-understandings are an integral part of understanding.

brought to the research process as a basis for further understanding. In this way my perspective aligns with Finlay (2008a) as she describes the movement of a researcher between striving for reductive openness and being reflexively self-aware as “dancing between bracketing pre-understandings and exploiting them as a source of insight” (p. 29). This “dance” not only occurred at the outset of my investigation as I looked to articulate my pre-understandings, but continued throughout the research process as those understandings evolved and changed.
In sum, in the context of this study my knowledge and experience as an anatomist played an important role in helping me understand and interpret the stories of each participant, but at the same time I needed to be aware of the influence of my pre-understandings in order to see the phenomenon of transitioning to an integrated curriculum in fresh new way. Taking note of my pre-understandings was not an effort to separate myself in order to obtain more “valid” results, but as a way for me – a researcher embedded in the context of the field – to foreground and hear with clarity the voices of participants.

I will now move past the dimension of negotiating my pre-understandings to the question of what my intentions are for hearing the stories of basic scientists. Exploring this question involves tension along the third dimension of the phenomenology framework – description and interpretation.

**Description and interpretation**

The aim of Husserl’s phenomenology is to discern the essence of a phenomenon, but more specifically it is to describe it. Descriptions typically consist of “what” something was, and “how” it was experienced (Moustakas, 1994). The focus is less on the researcher’s interpretation, and more on the description of the experience with the intent to gain knowledge and awareness. Heidegger had different intentions for his phenomenological pursuits in that he aimed to interpret people’s experiences rather than just describe them.

Heidegger’s recasting of phenomenology as one of interpretation rather than description was grounded in his position that as humans we are always interpreting what is around us. For example, the Ministry of Education in British Columbia provides learning objectives that high school students should attain for grade 10 science. This does not mean that every science teacher delivers the same lessons or uses the same teaching strategies. Each teacher interprets those objectives differently and thus will choose different ways to engage
students with material in order to help them attain those objectives. No interpretation is “wrong”, they are just different ways of understanding and implementing a document given their previous knowledge and experience teaching. Thus, a central tenet to Heidegger’s phenomenology is that there are many ways an experience can be interpreted. There is no one “correct” way, we just all understand and interpret things differently depending on our pre-understandings. Heidegger’s phenomenology, which foregrounds interpretation rather than description, is often referred to as hermeneutics.

In general, hermeneutics is the theory and practice of interpretation. The word hermeneutics is derived from the Greek god, Hermes, whose job was to communicate messages between the gods and the mortals (van Manen, 1990). This communication and cyclical messaging is symbolic of one of the most predominant concepts of hermeneutic theory – the *hermeneutic circle*.

The hermeneutic circle is not a set of procedures to be applied in a phenomenological study but rather a metaphor for the dynamic and reciprocal relationship between the researcher and the text. “Text” is understood in its broadest sense meaning documents, transcripts from an interview, notes from observations, or oral “text” from a conversation. Figure 2.4, for example, illustrates my engagement with the “text” of a participant during interview. I start on the left side of the circle, influenced by my prior knowledge and experiences about integration and anatomy education that I bring to the study. Before I move to the other side of the circle to engage with the participant I attempt to take note of my pre-understandings so I am able to focus on what she has to say about her experience rather than what I think I know about it. As I interact with the participant on the right side of the circle I remain open to her story and facilitate the sharing of her experience. Although my pre-understandings will inevitably be present in the questions I ask and how I engage with her, the aim is to allow her to speak in her own voice (J. A. Smith, et al., 2009). After our conversation I move back to where I started, to interpret what the participant shared. As I read
Figure 2.4 – The hermeneutic circle

through the transcript of our conversation new ideas about what transitioning to an integrated curriculum means will arise from the text. These new meanings shared by the participant will re-shape the pre-understandings I initially brought to the conversation. In other words, my earlier understandings will be replaced or revised as I move toward a greater understanding of the experience of curricular change. With this new understanding I can go back to the participant or the transcript again and again. Movement around the circle continues as my emerging understandings undergo constant revision each time I engage with the “text”. Cycling between the various texts (or “parts”) and my evolving understanding of the phenomenon (the “whole”) stops when my participants and I reach a shared understanding of what the phenomenon means or is about. However, despite coming to a relatively stable understanding I must still consider it as a tentative understanding of the “text” or phenomenon.

Heidegger’s student Gadamer (1989) furthered his teacher’s work on hermeneutics in emphasizing that we must “understand the whole in terms of the detail and the detail in terms of the whole” (p. 291). This dynamic relationship between the “parts” and the “whole” is an integral concept of hermeneutics and can be understood on multiple levels. For example, every time I engage with a
different anatomist and hear his or her individual story, it is one “part” contributing to my “whole” understanding of the experience of integration. I must move back and forth between considering each story on its own and what I understand them to mean as a whole. The concept of negotiating between the “parts” and the “whole” can also be applied to the analysis of transcripts, field notes, and documents in that it describes the movement of interpretation between a single word and the entire sentence, a paragraph and the entire text, or an interview and the entire study (J. A. Smith, et al., 2009).

My perspective aligns more closely with Heidegger and Gadamer’s interpretive approach than Husserl’s aim to describe. Inevitably this study did involve some description in illustrating what it is like for participants to transition to an integrated curriculum. But my ultimate goal was to interpret participants’ experiences and understand the impact the transition had on their teaching. Thus, although this study does include description in the sense of illustrating participants’ experiences, my grounding in terms of the goal of this study sits predominantly within Heidegger’s interpretive approach (Figure 2.5).

**Figure 2.5 – Description and interpretation.** The aim of Husserl’s phenomenology was to describe, where that of Heidegger and Gadamer was to interpret.
To this point I have articulated three dimensions that represent tensions researchers must negotiate in doing phenomenological work. How a phenomenologist deals with these tensions depends on one’s beliefs as well as the goals and questions of one’s research. As previously mentioned, locating yourself in the field is not a matter of placing yourself along a line between two extremes as if you represent more or less of each. Rather these dimensions allow you to evolve your own positionality in light of some the tensions within the field.

Writing – the “+1” of the 3+1 framework

The framework is titled “3+1” rather than just four because writing, the fourth aspect of phenomenological work is set apart in order to emphasize that it subsumes the dimensions of the other three axes. It is a dimension that is not only a part of all phenomenological research, but is fundamental to it.

Similar to van Manen (1990) my research approach foregrounds the process of writing. Writing is something that we all know is part of research but do not really talk about. Most often writing is the thing you do at the end of a study when it comes time to “write-up”, disseminate findings, or publish a manuscript. Within this framework of thinking about writing, writing is understood as a means for reporting, a process that is segregated from actually conducting the research.

I agree with van Manen (1990) in that writing does not just happen at the end of research. Rather, writing and research “are aspects of one process” (p. 7). Similarly for Barthes (1986), “research does not merely involve writing, research is the work of writing – writing is its very essence” (p. 316, as cited in van Manen, 1990). Emerson et al. (1995) also express how “‘doing’ [research] and ‘writing’ should not be seen as separate and distinct activities, but as dialectically related and interdependent activities” (p. 15). The idea that writing is an indispensable part of phenomenological work is grounded on the fact that the reflective and
interpretive processes that help us come to understand people’s experiences are enabled by writing. Writing does not just come at the end. As I participate in the field, I inevitably start to reflect on and interpret what I have seen and what participants have said. Writing these thoughts, reflections and interpretations down helps me to make sense of what is going on. Writing enables me to clarify my ideas and get a sense of what I know. At the same time writing helps me identify what I am still unsure about and will need to question and look into further. As noted by van Manen (1990) “writing gives appearance and body to thought” (p. 127), and it is not until we write something down that we really know what we know. In emphasizing the relationship between reflection and writing Emerson et al. (1995) point to John Forester’s (1984) phrase of “thinking with your fingers”. The connection between writing and thought is further illustrated by philosopher Jean-Paul Sartre’s experience of finding that as writing became difficult with age, so did thinking itself. “I still think”, Sartre (1977) shared in an

![Writing](image)

**Figure 2.6 – Phenomenology and writing.** The process of writing is an integral part of phenomenological research, and as such it is illustrated as encompassing the entire framework. Writing is the means by which a phenomenologist negotiates the other three dimensions, and is an essential factor in them coming to an understanding of the phenomenon under study.
interview, “but because writing has become impossible for me the real activity of thought has in some way been repressed” (p. 5, as cited in van Manen, 1990). In relation to the hermeneutic circle (Figure 2.4), as I return back to left side of the circle after engaging with a participant or observing in the field, writing is what helps me clarify the meaning of that interaction or assimilate what I observed so that I might start to understand the experience. Reflecting through the process of writing then allows me to see things in the field that could not before. The unity of research and writing is succinctly summarized by Emerson et al. (1995) in that “this process of inscribing, of writing field notes, helps the field researcher to understand what he has been observing in the first place, thus, enables him to participate in new ways, to hear with greater acuteness, and to observe with a new lens” (p. 15). I believe the dimension of writing, although highlighted by few, engulfs all of phenomenological work. As such, it is illustrated in the framework as perfusing the entire grid (Figure 2.6). By foregrounding writing I hope to bring attention to how committing to a regular practice of writing throughout the research process, and not just at the end, enables us to engage more meaningfully with, and understand more deeply, the experiences of our participants.

**Summary**

Phenomenology is an approach to research that is comprised of the diverse perspectives of many philosophers. Yet when in engaging in phenomenological research there is no need to sit in only one philosophical “camp”. Researchers draw from the perspectives of different philosophers as they work to negotiate their own approach in the field. This is one of the advantages of phenomenology; it is a tradition that includes a variety of approaches and encourages individuality and creativity (Langdridge, 2008). With a multitude of approaches comes a multitude of options and decisions which can also be a disadvantage, especially for a novice researcher. The 3+1 framework provides a scaffold on which those considering phenomenological inquiry might familiarize themselves with some of
the philosophical tensions within the field including the general and the particular, reduction and reflexivity, and description and interpretation. In addition, the framework also foregrounds writing as an enabler for helping to negotiate these tensions while carrying out a phenomenological study (Figure 2.7). My hope is that this framework will help researchers make informed decisions about their own phenomenological approach based on their beliefs and the research questions.

In terms of this study, my research approach draws from several areas. Originating from Husserl, it is phenomenological in that it is concerned with the experience of basic scientists’ transitions to teaching within an integrated curriculum. Drawing from Smith et al., my approach is idiographic in that my priority lies with attending to the particular experience of basic scientists within a

![Diagram of the 3+1 phenomenology framework]

Figure 2.7 – The 3+1 phenomenology framework.
specific context. Analogous to Finlay, I “dance” between taking note of my pre-understandings in order to remain open to hear my participants’ voices and using my pre-understandings as a source of insight to better engage with participants. From the work of Heidegger and Gadamer, my approach is *hermeneutical* in that I am interested in interpreting what the experience of transitioning to an integrated curriculum is like and what it means with respect to the teaching of anatomy. Lastly, from the work of van Manen, my approach is *textual*, highlighting the inseparable nature of writing and the research process.

With an understanding that I will never be able to articulate every aspect of my research approach, this chapter has been an attempt to be as explicit as possible. What is written here is a mere snapshot reflecting how I currently see the world from my specific context. As I grow as a researcher, and as I move on to inquire about different phenomena, how I see the world and my relationship to it and within it will most likely change and be refined.
Chapter 3 – METHODS

Overview

van Manen (1990) notes that “a real understanding of phenomenology can only be accomplished by ‘actively doing it’” (p. 8). One of the challenges in “doing” phenomenology is that it is a philosophy with no research protocol or study design to follow. Although some scholars have moved towards operationalizing a more stepwise approach to phenomenological inquiry (Giorgi, 1997; Moustakas, 1994; J. A. Smith, et al., 2009), difficulty remains in translating philosophical concepts to research methods. This is especially the case for those new to field. Rehorick and Bentz (2008) explain that “graduate students who encounter phenomenology for the first time often report mixed feelings about the push-pull experience of encountering a new domain of inquiry, an unfamiliar philosophical language, and methodology which defies efforts to generate a step-by-step, cookbook-like approach” (p. 21). Despite phenomenology’s defiance of well-articulated “steps”, this chapter is an articulation of my phenomenological “cookbook”, or how exactly I conducted this research.

The aim of this chapter is to describe in detail the design and methods of this study. Although in writing each step appears to follow a linear pattern from one page to the next, I want to emphasize that my approach for this study, as described in Chapter 2 (Methodology), was hermeneutical with movement between and within the various stages of data collection and analysis. After describing how I carried out this research I will close the chapter with a section on reflexivity, which delves into what exactly I bring to this study as a researcher.
Design

A case study design was used to explore the experiences of anatomists who transitioned from teaching within a traditionally\(^1\) organized anatomy course to an integrated curriculum designed around the context of clinical cases and procedures. Researchers tend to use case studies in different ways. Some define a case study as a research methodology (Creswell, 2007; Yin, 2009), where others use cases as a way to outline what it is they are studying (Stake, 2005). In the context of this research I am using the latter approach where the “case study is not a methodological choice but a choice of what is to be studied” (Stake, 2005, p. 443). As the aim of this research was to understand the experience of anatomists, a phenomenological approach, or methodology\(^2\), was used. Details of the case will be described later, but in short, three anatomy educators in a single program were a case of basic scientists who transitioned to teaching in an integrated curriculum. The “case” resided within the context of a first year integrated anatomy course in a medical school in the United States (US). Specifically, I used a single embedded case study design (Yin, 2009) - single in that it was one case of anatomy educators having to change their teaching, and embedded in that the case was made up of multiple participants.

Context

The medical, anatomy, and basic science education literatures were reviewed to find examples of integrated curricula. As recommended by Schofield (2002), the aim was to look for the “leading edge” of change and an example of “what could

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\(^1\) "Traditional" (or “classic”) anatomy curricula refer to courses or programs that are predominantly organized and assessed around the naming of anatomical structures and knowledge of their relationships to one another. Clinical correlations may be included but these are used as illustrative examples rather than the guiding framework of the course.

\(^2\) Methodology refers to the theory (or theories) that underpin what one does as a researcher, and methods correspond to the particular techniques the researcher uses to collect and analyze data (Johnson, 2000).
be”, meaning that my goal was to find an anatomy program where it appeared that integration was successfully accomplished. What I mean by successful integration is not that this case should be considered a “gold standard” of integration that every medical school should attempt to replicate. Rather, integration was successful in that there was a transformative change from the model in which basic sciences are traditionally taught to a model that members of the institution (including the basic scientists themselves) felt embeds the teaching of basic science in the context of clinical practice. The review of successfully integrated programs resulted in two possible sites. After email correspondences with each school a private university in the US, which I will refer to as Lillian Douglas University (or in short, Lillian Douglas), was selected as the context in which to carry out the study. As previously mentioned, this ‘successful’ case is an instance of successful integration, not a standard, for others to consider.

The “purposeful” (Patton, 1990) selection of Lillian Douglas was largely based on three factors. First, the program was deemed to be a successful example of an integrated program in that the teaching of anatomy is immersed in the context of medicine. Labs include procedures students will encounter during their later training in the hospital, and teaching is centered on anatomical problems in the context of clinical cases. Based on Yin’s (2009) rationale for single case studies, the use of Lillian Douglas as the only site of data collection was justified in that it represented a unique circumstance of integration done well. Second, in comparing the literature describing the two potential sites, Lillian Douglas highlighted the changes faculty had to make in their teaching whereas the other site under consideration explained that although an integrated curriculum had been implemented, the teaching of anatomy remained much the same. Lastly, having implemented the integrated anatomy curriculum over eight years ago, the faculty have had time to experience not only the implementation of an integrated curriculum but also the ongoing management and arising challenges associated with such a course.
The case

This study explored a case of basic scientists transitioning to teaching within an integrated curriculum. In other words, this was a case of basic scientists who went from teaching anatomy in a very traditional way to teaching it within a framework of clinical medicine. The case was situated within the context of the first year integrated anatomy course at Lillian Douglas School of Medicine. Participants were situated within the context of the anatomy course along with several other anatomy teaching faculty who did not meet the inclusion criteria for the study.

Participants

*Primary* participants were those faculty who met the following inclusion criteria:

- Teacher of anatomy
- Professional background as a basic scientist (PhD), rather than a clinician (MD)
- Transitioned to teaching in the integrated anatomy course at Lillian Douglas

Three anatomists at Lillian Douglas met these criteria. More detail regarding the backgrounds of each of the primary participants will be given in Chapter 4 (Findings), but I will briefly mention them here. Two (“Galen” and “Paul”)

3 have been teaching anatomy at Lillian Douglas for over twenty years and hold leadership positions in the anatomy department. Both made the transition to the integrated course during its development and implementation. The third participant (“Jane”) had recently completed her PhD and was in her first year teaching within the course at the time of the study. Her transition to the integrated anatomy course occurred eight years after the program was implemented. As

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3 Every name in this dissertation is a pseudonym. The introduction of a new name will be indicated by quotation marks to reinforce that the name is a pseudonym.
primary participants Galen, Paul and Jane made up the “case” of this study (Figure 3.1).

In addition to the three primary participants there are also faculty members who teach within the integrated anatomy course and/or experienced the transition to the new curriculum and did not meet the inclusion criteria. These secondary participants fit into the following categories with the number in parentheses indicating the number of individuals pertaining to each:

- Anatomy teaching faculty with a clinical (MD) rather than basic science (PhD) background (2)
- Retired surgeons (2)
- An education scholar (PhD) who helped support the transition (1)
- Anatomy lab staff (1)

As depicted in Figure 3.1, the focus of the study was to understand what it was like for the three primary participants (Galen, Paul and Jane - basic scientists without clinical training), to transition to teaching within an integrated curriculum. In addition to the primary participants, the other faculty and staff listed above were also interviewed for the purpose of gaining a better understanding of how the course changed and how it currently functions. In other words, although the secondary participants were not part of the “case”, their situation within the context of the integrated anatomy course positioned them to be able to inform and enhance my understanding of the environment within which the primary participants underwent the transition to the integrated course (Figure 3.1).

There were a total of nine participants (both primary and secondary). Aligned with Smith et al.’s (2009) idiographic approach to phenomenology, this small sample allowed me to hear participants’ stories in depth. The sample was small enough that I was able to write in detail about the experiences of participants,
while at the same time large enough to allow me to note similarities and differences between them.

Figure 3.1 – The case, context, and participants. The case of basic scientists transitioning to an integrated curriculum was within the context of the first year integrated anatomy course at Lillian Douglas School of Medicine. Primary participants were teachers of anatomy with a basic science background. Secondary participants helped to inform my understanding of the course and included those who currently teach in the program and/or were involved with the transition. The number in brackets represents the number of participants for each category. The dotted line signifies that the boundary between the case and the context of Lillian Douglas were not distinct.

The course

Inspired by medical practice, the content and delivery of the first year integrated anatomy course at Lillian Douglas is largely guided by clinical cases and the surgical and radiological application of anatomy. The course is six months long, starting in September and continuing until the end of the following February. As stated in the introductory lecture notes, the primary goal of the course is to “develop students’ skills in thinking and solving problems in three dimensions”.

In terms of teaching, the philosophy of the course embraces a “student-centered” approach where the role of faculty is to act as guides to help students learn and find resources on their own rather than telling them information. This approach was manifested in what participants described as a “Socratic” method of teaching. There is also an emphasis on students working together in small groups or teams in order to complete dissections and work through clinical cases. The teaching approach of the course will be explained in further detail in Chapter 4 (Findings).

Teaching faculty

As alluded to in the “participants” section, the course is taught by multiple faculty with different backgrounds and expertise. A distinction I will draw now and carry throughout the dissertation is the difference between the “core” and volunteer anatomy teaching faculty. There are five core anatomy teaching faculty including the three primary participants who have a basic science background, and two of the secondary participants who are clinically trained as physicians in addition to their experience as basic scientists. Clinical staff, fellows and residents from the Departments of Radiology and Surgery are also involved with teaching the course, but do so on a volunteer basis and are not considered part of the “core” faculty. The Department of Surgery’s involvement is mainly in helping students with surgical procedures and dissections in the lab, whereas the Department of Radiology is involved in providing radiology lectures and seminars. The course also draws several other volunteers such as retired surgeons and senior medical students who give their time to teach in the lab.

Course structure

The course is broadly organized into five body regions (thoracic, abdomen, pelvis, limbs and head/neck). The class of 100 medical students at Lillian Douglas is divided into five smaller groups of 20 that they remain in for the entire
anatomy course. Using the thoracic cavity as an example, the entire class will study the thorax at the same time, but each group of twenty is designated to one of the five core anatomy teaching faculty. Upon completing the thoracic region and moving on to abdomen, the anatomy teaching faculty switch to a different group of 20 – so groups of students stay the same, but each has a chance to learn with each core anatomy professor. In reality these groups are more fluid than I have described. This is especially the case in lecture where the class is unified in one classroom, and in the lab where although the space is somewhat divided and students are assigned a specific donor (embalmed cadaver) to dissect, the teaching faculty and students are able to move around freely and ask any faculty member (not just the one assigned for that particular region) for help. Throughout this section more detail will be given with regards to these groups and the organization of the lab. Broadly speaking the course is structured around three different learning opportunities - lectures, seminars, and labs (Figure 3.2).

Lectures

Lectures are used as an introduction to each region of the body and as described in the lecture notes introducing the course “are viewed as playing a supplementary role to both seminars and labs”. Lectures are either focused on anatomy and delivered by one of the core anatomy faculty, or they are concentrated on radiology and delivered by a radiologist. Lectures are all held in the same lecture hall that seats almost exactly the class of 100 students. Each lecture varies depending on the teaching style of the faculty member. All lecturers that I observed made use of power point slides with text and/or images and some utilized white boards that are situated on either side of the overhead projector screen. The room is small enough that you can easily see what is written on the whiteboard from the back row.
The course. The course is largely focused on working through clinical cases and surgical procedures in the anatomy lab. This learning is supported by anatomy and radiology lectures and seminars. Due to scheduling of other courses in the medical program these different teaching/learning opportunities do not necessarily occur in any particular order but will be visited at least once and sometimes twice for each of the five body regions studied (thorax, abdomen, pelvis, limb, head/neck).

Seminars

There are two types of seminars in the integrated anatomy course. One is scheduled before the lab (not necessarily immediately before), and is meant to introduce students to and start their discussions of clinical cases. The other is focused on radiology and is scheduled after (again, not necessarily immediately after) the lab in order to reinforce what students learned during dissection. More detail regarding each of the seminars will be given below, but I will first describe the context in which both take place.

Both the case based and radiological seminars are held in five multi-purpose rooms that are located in the same building one floor down from the anatomy lab. These rooms are identical and are all adjacent to each other down a long
hallway. Essentially they are flexible classroom spaces with four large “V” shaped desks and movable chairs. Each desk is equipped with two iMac computers. The organization of each seminar room facilitates learning in small groups as students can easily sit on either side of the desk to face each other and discuss cases, or gather around the computer to view radiological images.

The core anatomy teaching faculty facilitate the clinical case based seminars. Each group of twenty students is assigned a specific seminar room that they remain in for the entire course. One anatomy faculty member is assigned a particular room and leads the seminar for that group of students for the duration of the body region being studied. As they switch to a different region, the core faculty member moves to another seminar room and a different group of students. The number of case based seminars varies from one to two per body region. Every student has online access to the same case descriptions and learning objectives. There is usually three to four different cases for the approximately two hour seminar, each with a few guiding questions. For example, in studying the pelvic region, one case involved childbirth with guiding questions including dimensions and shape of the female pelvis as well as movement and rotation of the baby through the birth canal. Or when studying limbs one case involved a bike accident and students had to determine the neural and muscular deficits given what movements the patient is able to perform or not perform. Despite having the same objectives, the structure and delivery of each seminar is different depending on the faculty member facilitating the session. Although, as previously mentioned, the philosophy of the course emphasizes group process and learning through discovery, each anatomy faculty member has their own unique teaching style and conception of what this looks like in the classroom.

The other type of seminar focuses on radiology and largely involves students guiding themselves through online exercises with the assistance of radiology residents and the core anatomy teaching faculty. These seminars are held in the
same multi-purpose rooms as the case based anatomy seminars and occur once during each body region studied. Similar to the case based seminars, the core anatomy faculty stay with the same group of students that they are with for whichever region is being studied. Five volunteer radiology residents distribute themselves between the five multi-purpose classrooms. Students work through computer based radiology exercises which involve relating the anatomy they have seen in the lab to different radiological scans (X-ray, MRI, and CT scans). These exercises are largely developed by the Department of Radiology. In each seminar room the radiology resident and the core anatomy faculty member circulate around the classroom and assist students when they ask for help.

Labs

The dissection lab is where students dissect and carry out surgical procedures in relation to the region they are studying. The physical space of the lab is one large open room that is sectioned into different areas by blackboards that act as dividers. The lab is used by various health professional programs at Lillian Douglas who each have a specific area where their donors are located. The blackboards are essentially walls that do not go completely to the ceiling or the sides of the room (Figure 3.3). Each side has a blackboard surface and is supplied with multiple colours of chalk. Students gather around these blackboards at the start of each lab for a pre-lab talk given by the core faculty member that is leading their group of 20 students for that particular region. The talk varies in length from 15-30 minutes depending on the instructor. After the talk, the lab is student directed.

Dissection is cadaveric based with students teamed in groups of four around each donor. Each group of 20 students has a designated area in the lab (same group of 20 as in the seminars, 5 donors located in one area of the lab – Figure 3.3). As mentioned previously, each core faculty member stays with the same group of twenty for each region of the body including seminars and labs.
Although students and faculty each have designated sections of the lab these are far from impenetrable boundaries. In reality movement throughout the lab by both faculty and students is quite fluid. Students can ask any faculty member for help and faculty are free to move to address questions at tables beyond their designated section.

The lab is organized and driven by an online resource that contains dissecting instructions, illustrations, and radiological images for every lab as well as additional web activities. Each dissecting table has a computer mounted from the ceiling so groups have access to and can follow instructions from the online course resource. The keyboard and mouse are covered in heavy-duty plastic so students can move between using the computer and dissecting without worrying about taking off and putting on their gloves. Plastic models and skeletons are available as supplementary resources, but no additional prossected specimens (previously dissected cadaveric models) are provided. Each dissecting team (group of four students with one donor) also has access to an anatomy atlas that can be propped open on a book stand that is fixed to the end of their table, as well as a large Tupperware container of dissecting tools. The box of tools is filled with the same surgical instruments and clamps that are found in operating rooms. Rather than the traditional method of dissecting a region to identify the anatomical structures, students are prompted with cases and work through surgical procedures that they will likely encounter in the treatment of such a case. Each anatomy faculty member typically introduces the case in their pre-lab talk. Details and step by step procedural instructions are outlined on the online resource. For example when studying the abdominal region, one of the cases describes a 65 year old male whose chief complaint is abdominal pain and fatigue. The online resource provides information regarding the patient’s history of the present illness, past medical history, family history, social history, a review of symptoms, findings from physical exam, as well as lab results. The online resource then uses short answer questions to guide students through the case.
Figure 3.3 – Birds eye view of the middle two (of four) sections of the lab providing dissection space for four (of five) student groups. The circles represent where the anatomy faculty member delivers their pre-lab talk in front of the dividing blackboards, and rectangles in the corresponding colour indicate the tables (one donor to four students dissecting) that the faculty member is responsible for and circulates around during each lab. In moving on to teaching the next region of the body each faculty member will switch to another section of the lab to work with a different group of 20 students.

and ultimately to the diagnosis, in this example, of colon cancer. Treatment is discussed more holistically, but the emphasis in lab is on the anatomical structures, their relationships and the surgical procedure for resecting the cancerous segment of the colon.

Depending on the region, specific surgeons and residents are invited from the Department of Surgery to volunteer in each lab. For example orthopedic surgeons are invited when students are dissecting the knee and general surgeons are invited when studying the abdomen. Unlike the core anatomy teaching faculty who circulate within their group of 20, volunteers, including
retired surgeons, senior medical students, and invited surgery faculty, rotate freely throughout the entire lab.

Assessment

Students are given two summative pass/fail written exams, one mid way through the course and one at the end. Questions for these exams are drawn from or based on the activities and questions throughout the online anatomy resource which was developed largely by Galen and Paul with input from faculty in the Departments of Surgery and Radiology. In addition to the two summative exams, and more heavily emphasized by the anatomy teaching faculty, are multiple student self-assessments which are offered periodically throughout the course. These include “bell ringer” type exams where students are asked to identify structures tagged on donors, as well as online assessments that test the application of anatomical concepts in the context of cases and through the interpretation of radiological images. The core anatomy faculty also offer review sessions scheduled outside of course hours to go through the answers of self-assessment exams with students, and address any questions they might have.

Site Access

Initial contact with Lillian Douglas was made via email with the director of the anatomy course. After reading the proposed research and consulting with the chief of anatomy as well as the rest of the anatomy teaching faculty, the director extended an invitation for me to observe the medical school anatomy course for five weeks and interview members of the faculty during that time.

Invitation for faculty to participate and informed consent

Before arriving at Lillian Douglas I invited the anatomy teaching faculty to take part in the study via email. Names and emails of potential participants (primary
and secondary) were obtained from the director of the course. Emails were individualized depending on the participants’ background and role with the anatomy program, but all included a brief outline of the goals and objectives of the study and information about my previous experience and research. Attached to each email was a copy of the study consent form which gave participants further details regarding what the study entailed in terms of their participation, and asked for their informed consent to have their teaching observed as well as be interviewed about their teaching and experiences (Appendix). Some participants signed and returned the consent form electronically, while others chose to sign a hard copy for me to collect when I arrived on site.

**Ethics approval**

Study approval was provided by the Behavioral Research Ethics Board (BREB) at UBC on August 17th, 2012. UBC BREB number H12-01603. The Human Investigation Committee of Lillian Douglas University then reviewed the project and granted exemption from further review for educational studies.

**Visa**

As Lillian Douglas University is located in the US, I was required to obtain the Exchange Visitor non-immigrant visa (J-1 visa) as an individual approved to participate in a study-based exchange visitor program. This process included working with the administration at Lillian Douglas as my designated sponsor to complete the DS-2019 form (Certificate of Eligibility for Exchange Visitor (J-1) Status). After being issued a DS-2019 form I was required to pay a SEVIS I-901 fee to the Department of Homeland Security (DHS). This documentation along with my Canadian passport enabled me to obtain the J-1 visa for the duration of the study.
Data collection

Observations

I arrived in the field in mid October, approximately one and half months after the anatomy course for that year began. The director of the course provided me with a schedule of all of the anatomy lectures, labs and seminars over the five weeks I would be there. Throughout my first week in the field I “floated” – sitting in on lectures and seminars, spending time in the lab, and attending faculty meetings. In the lab I walked around and spent time observing each core anatomy faculty member, and during seminars I floated from room to room making sure I got a chance to see all the core anatomy faculty members teach. I did not formally interview participants but rather was casually being introduced to, and developing a sense of, the people, context and rhythms of the course. During this first week, and for the remainder of my time at Lillian Douglas, I was an observer of the program, continually writing field notes to document what I saw and heard.

After the first week I became more purposeful in my observations. From the schedule I determined there were five more labs to observe over the remaining four weeks. I designated each of the labs to follow one of the five core anatomy faculty for the entire duration of the lab. From the beginning of their pre-lab talk and as they circulated around the lab, I was focused on observing their teaching and interactions with students. Similarly for seminars I determined that after the first week of “floating” there were three sessions left to observe during my remaining time. I divided the time left by the core anatomy faculty members so I would have an equal amount of time observing each. As lectures are given to the entire class I did not have to be concerned with dividing my time amidst faculty and was able to attend in full the five lectures delivered during my visit. Four of these lectures were given by the core anatomy faculty and one by a radiologist.
In addition to lectures, labs, and seminars I also took field notes for sessions and events outside the anatomy timetable. This included anatomy faculty meetings held prior to most labs, self-assessment review sessions, make-up sessions for school closures, meetings with medical school administrators, and medical education events and discussion groups.

Glesne’s (2011) “participant-observation continuum” is a useful tool in helping articulate my position in the field. Glesne describes participant observation as ranging across a continuum from mostly observation to mostly participation (Glesne, 2011). As illustrated in Figure 3.4, at one extreme is the observer who has no interaction with those being studied (like someone observing from behind one way glass), and at the other end full participants are those who are actual functioning members of the community. Moving away from the position of a “pure” observer there is a progressive increase in engagement with participants. Using the language of Glesne’s continuum, during my time at Lillian Douglas I was in the range of an observer as participant in that I was primarily an observer but had some interaction with participants. The majority of the time I was taking notes on what participants were saying and doing rather than participating as a teacher myself. Thus, I was mostly positioned as an observer. However, I was not completely isolated from participants or students in the context of lectures, labs, and seminars and engaged with them at least somewhat. For example, addressing questions students asked me in the lab, and questioning participants about something they did or said while in a seminar or review session. Indicated by the range of red on the continuum (Figure 3.4), as my time in the field progressed and I started to interview and build relationships with participants I became more engaged in the community.

Although I was observing throughout my entire visit at Lillian Douglas, it was especially important during the first week in that I was developing relationships with participants prior to interview, as well as getting a sense of the context of the
course. When it came time to discuss with faculty about their experiences, I had a frame of reference from which to better understand their stories.

**Figure 3.4 – Participant observer continuum.** This figure is developed from Glesne’s (2011) description of the “participant observer continuum”. Glesne explains participant observation as ranging across a spectrum from mostly observation to mostly participation. As indicated by the range in orange, during my time at Lillian Douglas I was predominantly an observer but had some interaction with participants and students in the context of the anatomy program.

In the field I carried a notebook and pen with me at all times, and started taking notes early on in order to establish a “note-taker” role. While observing lectures, seminars and labs I wrote both descriptive and analytic notes. The descriptive text illustrated the setting, participants, and what was going on in as much detail as possible. My goal for writing descriptive notes was to include enough detail that in a year or five years from now I will still be able to visualize the day, setting, people, and what was said and done. Although my primary objective while taking field notes was description, embedded within the descriptive text were analytic notes – my questions, thoughts, and feelings, about what was happening. These brief reflexive notes not only marked my initial interpretations but also tracked my experiences throughout the research process. Following the notation suggested and utilized by Emerson et al. (1995), only words that were actually taken down verbatim at the time of observation were placed in quotes, and speech not written down word for word was written as indirect quotes or paraphrased. This was mainly to ensure participants were accurately represented (Emerson, et al., 1995).
The notebook I used in the field was for my eyes only, but as soon as I could, either during breaks throughout the day or at the end of the day, I expanded my handwritten jottings into typed full field notes that I could share with my two PhD supervisors. This involved taking what was written in my notebook and typing it up in as much detail as possible, filling in and adding to my descriptions as much as I could remember without worrying about over editing or composing a polished piece of work. In typing out my notes I also added additional context and explanation in anticipation that these expanded field notes would be read by an outside audience, mainly my PhD supervisors. I typed out these notes in a Microsoft Word document with each observation labeled with the date, time, location, and faculty member(s) I was observing. Descriptive notes were typed in the body of the typed document and analytic notes were inserted as comments using track changes.

Writing full field notes was not only an opportunity to expand and enrich my descriptions, but also a chance to reflect on the day in general. I read and re-read these notes during my breaks and in the evenings in order to invoke some tentative interpretations as well as think and write about my own experiences and reactions in the field. I titled and saved these writings as “evolving understandings”. Reflecting on my field notes was also important for pointing to areas needing further observation as well as planning my actions for subsequent days in the field.

I began interviewing participants during my second week in the field. Observations were still essential once I started interviewing in that as participants shared how their teaching had (or had not) changed, it was only through observation that I could see what that looked like, and if/how what they described was applied in the classroom or lab. In other words, continued observation allowed me to see how their de-contextualized talk during interview manifested in the situated action of the teaching environment (Emerson, et al., 1995). Concurrently observing and interviewing also allowed me to ask participants to
expand on or talk about the meaning of specific language, actions, or events that I witnessed in the field.

**Interviews**

Two semi-structured interview protocols were developed prior to entering the field - one to guide my conversations with primary participants, and the other for secondary participants.

The goal of my interviews with primary participants was to explore their experience of transitioning to an integrated curriculum and how it impacted their teaching of anatomy. Broadly speaking, I asked participants to tell me about their experience of making the change to an integrated curriculum. I wanted to hear their story of transition with emphasis on what it was like for them.

My conversations with secondary participants varied depending on their position with respect to the anatomy program and their involvement in the transition to the new curriculum. As mentioned earlier in this chapter although my main objective was to understand the experience of change for basic scientists, input from clinicians and other educators involved in the integrated anatomy course (secondary participants) contributed to that understanding.

Interview protocols outlined different “areas” of questioning, not necessarily specific questions. This was done in order to hold to phenomenology’s aim of “going to the things themselves”. In other words the goal was to hear about integration from the voice of those who had gone through it rather than through the lens of an anticipatory framework. In sum, my aim for the interview from design to facilitation was to enable participants to share their experiences in their terms rather than those imposed by me.
Prior to entering the field interview protocols were piloted with two UBC faculty members who both had a basic science background. Following these pilots, minor changes to the wording of the interview protocols were made.

As I came to know the faculty during the first week of observation I gained a better sense of who would be able to inform my research question and what areas to inquire about during interview. This lead to a revision of the original two protocols as well as the drafting of additional protocols, which were then submitted and approved as addendums by the BREB at UBC.

Interviews were held at a location selected by the interviewee, usually his or her office or in one of the multi-purpose rooms adjacent to the lab. Over the course of four weeks I interviewed each of the primary participants two or three times and secondary participants one to two times. Each interview was approximately one hour in duration. In order to allow time for elaborating on notes and reflection I did not schedule more than two interviews per day. Interviews were audio recorded and I used a hard copy of the interview protocol to take down jottings and reminders throughout my conversations with each participant. Interviews were transcribed within 24 hours by a Vancouver based transcription service. The choice to use an external company for transcription was grounded on the fact that having a reification of my conversations to immediately share and reflect on with my PhD supervisors would be more valuable than what I would gain from taking the time to transcribe the interviews myself. Having interviews transcribed gave me a chance to immediately read, and re-read my conversations thus allowing me to gain some initial understandings rather than spending hours typing. This was agreed upon with my PhD supervisors as the best use of my rather short time in the field.
Documents

In order to get a sense of how the course had changed I asked participants during interview if they had copies of any course syllabi or objectives before and after the transition. I was able to collect electronic copies of these documents during subsequent interviews and meetings. I also collected several power point presentations that were created for the purpose of explaining the development and planning of the integrated anatomy course to the wider faculty of the medical school.

Data analysis

The following section explains how I engaged with and went about making sense of my compiled field notes, interview transcripts and documents. As mentioned at the beginning of the chapter, although it may appear to be a unidirectional set of steps, in reality interacting with the data involved movement between the different levels of analysis thus reflecting the iterative and cyclical nature of the hermeneutic circle. My overall aim throughout data analysis was to interpret the primary participants’ experiences with a commitment to understanding their stories from their perspective.

Confirming accuracy of transcripts

Immediately upon receiving the transcribed interviews from the transcription service company I listened through each interview and proofread the transcript. This was to ensure that the transcripts were a reflection of the conversations I had with participants.
Integrating data sources

Repeated reading of field notes, interview transcripts and documents helped me gain a sense of the overall picture or “whole” of participants' stories as well as began a process of engaging across the multiple sources of data. For interviews, I listened to the audio recording while reading each transcript for the first couple times through.

Noting provisional codes

Initial coding was completed using a qualitative data analysis software called Dedoose (Lieber, 2013). Once all transcripts, field notes and documents were uploaded to the program I went through the data line by line highlighting words and quotations and labeling them with “codes”. Codes identified what the text said or named different categories or analytical concepts that the text represented. During this phase I intended to remain as open as possible. There were no “rules” in terms of what codes I created as the goal was to make as many provisional meanings for the text as possible. As I read over each sentence I continually asked myself ‘What does this mean? What is its point? What does it say about the experience of integration?’ With an awareness of my pre-understandings, my approach was to develop an interpretation derived from the participants’ experiences and stories, not from theory I imposed upon it.

Deciding what codes to emphasize

The next phase of analysis included reading through my provisional codes and making decisions about what should be foregrounded, and then writing concise statements of what those codes said or meant in relation to my research question as a whole. Three factors contributed to my determining which codes to further develop and which to put aside. First, I asked myself which codes spoke to my overall question of what was it like for anatomists to transition to an integrated
curriculum? And what did that mean for their teaching? Second, I prioritized codes that participants highlighted as important. This was indicated by their emphasis during interview or their expression of it through their interactions and engagement within the teaching context. Lastly, I prioritized codes that appeared to recur throughout the data. There is a tendency to think that more is better with respect to how many times a code is mentioned, but Smith et al. (2009) explain how this is only one indication of importance and should not be overemphasized. A meaningful code may only be mentioned once by a single participant. This is particularly likely to occur in studies such as this that have a small number of participants. In the language of hermeneutics, determining what codes were important involved circling from the “parts” of my initial notes to the “whole” of the larger more encompassing question I was trying to address.

**Compiling excerpts**

After deciding which codes to foreground I used Dedoose to compile all the excerpts (quotations and text from the data) that I had originally labeled with each of the codes. At this time I also went back to the original transcripts and field notes to search for any additional text that might speak to the codes I had decided to emphasize given my research question.

**Writing**

As discussed in Chapter 2 (Methodology), I consider writing to be an integral part of research. As such, I was continually engaged in writing throughout the entire study.

In the field I used my breaks during the day to write my thoughts and even poetry about my experiences and feelings about the research process. On weekends I made a more concerted effort to think back on the week and summarize in
writing what I learned, what questions I still had, and to plan how I would go about collecting data on areas that I needed further understanding.

In the later stages of data analyses after completing the process of initial coding and compiling of excerpts, I used writing as a way to organize my thinking on how the codes fit together. The first stage of writing and analysis, as reflected in Chapter 4 (Findings), was to develop a structure for the telling of each participant’s experience of transitioning to an integrated curriculum. The focus of this stage was on the data and hearing the voice of participants. The second stage of writing and analysis as reflected in Chapter 5 (Discussion) involved re-reading and interpreting participants’ stories in light of explanatory concepts from outside the data. Although some comparison between participants’ experiences was made during the first stage of writing/analysis, my goal in the second stage of analysis was to determine how the experiences of the participants were similar and how were they different. My aim was to draw attention to how each anatomist’s experience of integration was unique, while at the same time, look beyond the individual experiences of participants in order to better understand the phenomenon of transitioning to an integrated curriculum.

**Engaging multiple perspectives**

Although I was the sole investigator of this study, I was not alone in terms of interpreting the data. Both my PhD supervisors and the participants of the study had opportunities to read and provide feedback on the description and interpretation of the participants’ experiences.

Starting from my first week in the field my PhD supervisors’ contributions to data analysis was ongoing. During my entire time at Lillian Douglas we had weekly meetings over Skype. Our conversations were centered on reviewing transcripts, field notes, and my “evolving understandings”. These conversations were beneficial from a pragmatic standpoint in that they gave me incentive to have my
field notes up to date and written in a way that could be understood by an outside audience. More importantly these meetings were an opportunity to engage multiple perspectives in the interpretation of the “text” – what participants shared during interview, what I observed from the field, and the documents I had collected. Essentially the conversations I had with my supervisors while I was in the field represented the merging of four interpretations: my own, my two supervisors, and the participants’ interpretation of their experience. Each of us has our own positionality including different academic backgrounds and experiences. These different theoretical and experiential lenses led to greater creative potential in interpreting the text and increased the chances of seeing the data in new ways.

My view of the text was distinct from my supervisors; not only in the sense that we have different backgrounds, but also in that I had developed relationships with the participants whose perspectives the text represented. This merging of different interpretations of the data during my time in the field provided richness to the analysis as well as enhanced further data collection by allowing me to become aware of and turn my attention to things in the field that I might not have considered through only my own lens of understanding. In order to keep with the tradition of phenomenology I made sure to foreground participants’ voices amidst the multiple perspectives contributing to the analysis. In sum, although being able to regularly converse with my supervisors greatly enhanced my potential to interpret and engage more meaningfully in the field, I needed to be mindful of the research question and the voice of participants so that I did not become lost in a sea of interpretive possibilities.

Analysis continued to be informed by my supervisors as I transitioned back to Vancouver. I met with them on a monthly basis to receive feedback on my ongoing writing. This later phase of analysis also included participants of the study. Once I had interpreted each primary participant’s story of change and composed a collective document of their experiences, I invited each of them to
read and assess the integrity and accuracy of my interpretation and 
representation of his or her experience of transitioning to an integrated 
curriculum.

Overlap of data collection and analysis

The structure of this document gives the impression that data were collected and 
then subsequently analyzed by proceeding from step one to the next. However, 
as I previously mentioned, data analysis began early on. Although my priority at 
Lillian Douglas was to collect rather than interpret data, reading through my notes 
and engaging in conversations with my supervisors helped me better observe 
and question throughout my time in the field. This overlap of data collection and 
analysis allowed me to take advantage of “flexible data collection” (Eisenhardt, 
2002) in that as my understandings developed and I came to know the context 
and participants better I was able to add interviews, change protocols, and make 
observations that were not previously scheduled. If I met people who I felt were 
able to inform my research question I was able to take advantage of those data 
collection opportunities by being flexible in my approach. This flexibility was not a 
license to be unsystematic, but rather a chance to “take advantage of the 
uniqueness of a specific case and the emergences of new themes” (Eisenhardt, 
2002, p. 16)

Research closure

One pragmatic factor determined the closure of data collection - time. The 
director of the anatomy course suggested the five-week time frame that worked 
best for him and the faculty. At first I was concerned that five weeks would be too 
short and would potentially be a limitation of the study. However, at the end of 
five weeks I felt confident that I had heard participants’ stories and was not 
observing anything new in the field. I did not feel like I was cut short at the end of 
five weeks, and left Lillian Douglas feeling pleased with the data I had collected.
The fact that I could always revisit the site or connect again with participants via phone or Skype was also a reassurance that time would not be a limiting factor.

In terms of closure with respect to data analysis, as described in Chapter 2 (Methodology), the decision of when to stop moving around the hermeneutic circle, or to stop iterating between the data and the composition of participants experiences, was when the participants and I reached a shared understanding of the meaning of their experiences. At this point going back and forth between the data and writing only confirmed rather than added to their stories.

**Reflexivity**

This section is both a positioning of myself as the primary researcher of this study as well as a reflection on my experience in the field. As noted by Lincoln and Guba (2002), “any case study is a construction itself, a product of the interaction between respondents, site and researcher” (p.207). As such, the construction of this case is largely rooted in my own character, background, experiences, and beliefs. The following is an examination of who I am and how that impacted my involvement and interpretation throughout this study. As discussed in Chapter 2 (Methodology), my aim was not to try to put my unique characteristics and background completely aside but to engage in the “dance” (Finlay, 2008a) between reduction and reflexivity. This involved utilizing my pre-understandings to better engage with participants while at the same time hearing their stories without imposing my own perspective or framework. As Gadamer (1989) explains, “the important thing is to be aware of one’s own bias, so that the text can present itself in all its otherness, and thus assert its own truth against one’s own fore-meanings” (pp. 271-272).

My passions are anatomy and teaching. The spark for my interest in these fields started early on as I studied kinesiology at Simon Fraser University (SFU). When my classmates were grumbling about how much detail we had to learn, I was
joyously bathing in the intricate beauty of how the human body is structured. After my undergraduate degree I continued my studies in education and went on to teach high school science. I was happy teaching high school but missed the “spark” that anatomy lit in me. This led me to complete a M.Sc. in Clinical Anatomy at the University of Western Ontario (UWO). As discussed in Chapter 2 (Methodology), having a background in anatomy in the context of this study was beneficial in that I was able to speak the language of my participants. Later in this section I will go into further detail of how my anatomy background and training differed from that of my participants.

What brought me to this study inherently shaped the lens from which I developed and carried out the research. The year before I began my PhD I worked as a research assistant for a task force whose mandate was to develop the initial vision and report from which to guide the renewal of the undergraduate medical program at UBC. As part of this project I was engulfed in the literature, recommendations, and conversations that spoke to the future of medical education. At the same time I was also a teaching assistant in the anatomy lab. I taught gross anatomy as well as neuroanatomy for the first and second year medical program and, as such, became a member of the anatomy education community at UBC.

As the anatomy faculty at UBC became aware of my role in the foreseen curriculum renewal, some began to engage me in conversations about what exactly was going on. Since the project was in its infancy and still at a broader level of guiding principles, I really did not have any answers to their concerns. What struck me was that I seemed to be hearing similar questions from different people. Would there still be dissection? Would lab time be cut? If there is going to be more “clinical” in the first two years, then what will happen to the basic science it is replacing? In general, what I understood myself to be hearing was concerns about loss and feelings of uncertainty for the future. That year I also attended a meeting that called together anatomists from across Canada where I
heard similar apprehension from anatomy faculty who were anticipating upcoming changes to their curricula. As the work of the task force at UBC progressed and I learned about the overarching concepts that would frame the new curriculum, I began developing my own concerns and questions similar to those of my anatomy colleagues. As an anatomy educator what would my future role look like within the medical program? And more concerning, would there even be a role for basic scientists as the curriculum moved towards more and more clinical application? Teaching anatomy has given me a fairly good foundation for understanding the language of medicine; but how will my practice need to change - how will I need to change - in order to contribute to the education of future physicians? These questions are what ignited my search for anatomists who had already made the transition – and had done it well. This search is what eventually brought me to Lillian Douglas.

Much like the participants of this study, I am an anatomy educator. As previously mentioned, being familiar with the language of anatomy helped me understand and relate to participant’s references to teaching anatomy and the use of different anatomical models and teaching strategies. It also helped me better observe and take field notes as I was completely comfortable in the context of the anatomy lab and could easily abbreviate and understand somewhat lengthy and intricate anatomical names. I am also a classically trained anatomist meaning that I was taught anatomy the “traditional” way by progressing through different regions of the body, and learning in detail the different parts as well as their functions and relationships. In this respect my lens represents how the anatomy program at Lillian Douglas was structured before they transitioned to the integrated curriculum. This frame of reference was useful in the field in that I was able to discern how the program goes beyond the “traditional” and into the realm of clinical medicine. Realizing this early on, I made a note whenever the language I was hearing was unfamiliar or when procedures and tools in the lab were foreign to me. In my “evolving understandings” I wrote that,
My "traditional" understanding/frame of reference is really the anatomy textbook. The most popular texts do have clinical correlations and these are all familiar to me, but anything beyond that I don't really know. So when I keep on reiterating throughout my observations that something is "beyond traditional anatomy" I could equally say "beyond the text" as this is really what it means.

Thus, the way I was trained as an anatomist helped me in the field as an indication of how the teaching of anatomy had changed beyond the traditional framework. As an anatomy educator I was an “insider” of the profession, but, as a researcher at Lillian Douglas I was an “outsider” of the integrated anatomy course.

Despite technically being an outsider I did not feel like one for long as I was quickly embraced and made welcome by the entire anatomy department as well as the administrators of the medical school. Not even two days into the field I felt completely comfortable chatting with faculty and had multiple invitations to dinner and to visit their homes and families. The warm and receptive nature of the faculty at Lillian Douglas played a huge role in my quick transition to feeling like a part of the community.

I genuinely enjoyed spending time with every person I met at Lillian Douglas, not only as participants of the study, but as friends as well. The closeness of my relationships with participants was beneficial in helping participants feel comfortable sharing with me. At the same time I had to remain aware of how these growing friendships would impact my perception of their stories. I did this by continually revisiting my research question and probing their stories and words to speak to it. My relationships with the anatomy faculty at Lillian Douglas not only allowed me to engage in their narratives about change but also helped me become a better anatomy teacher as I was able to observe some who are veterans in the field. Thus amidst my focus on my research question of the experience of transitioning to an integrated curriculum were thoughts about my
role as an educator and my position and growth within the field of anatomy education.

Unlike my participants my research is in education rather than the basic sciences. So while I teach a subject that is categorized as a basic science, I am hesitant to actually call myself a “basic scientist”. I caught glimpses of this difference between the anatomy faculty and myself mainly in our different approaches to research. In becoming basic scientists primary participants were trained in testing hypotheses, quantifying data, correlating variables and finding answers to problems. These are great assets in teaching anatomy as the framework for thinking about problem solving in the natural sciences can be applied to learning and discovery through cadaveric dissection (Rizzolo & Stewart, 2006). However, as someone interested in understanding people’s experiences, I am more positioned in the constructivist paradigm where an event or experience can be interpreted in multiple ways as opposed to being one correct answer “out there” that I can find and measure. Specifically regarding analysis, as my methodology is grounded in hermeneutics it embraces the notion that there is no one “right” interpretation. Thus, the interpretation I constructed in the chapters to come is one of many “true” possibilities. In light of this I had to put aside the idea of searching for a single truth and simply try to understand my participants experiences the best I could.

My role during my time at Lillian Douglas was discussed and established during my first meeting with the director of the anatomy program. I remember him asking if I wanted to be “put to work”, as in teaching in the anatomy lab etc. I had considered this before my arrival and determined that in the relatively short time I would be there, to have to prepare to teach and then spend the time I had in the lab engaging with students would take time away from interviewing and observing faculty which was the primary goal of visiting Lillian Douglas. If I would have taken on a more participatory role in the program I would have gained first hand experience of what it is like to transition to an integrated curriculum. But
with the set duration of my time in the field I decided that addressing my research question would be best served by focusing on the experiences of those who had already made the transition rather than myself.

The only time I had to negotiate my role as an observer was when students asked me questions in the lab. Although the director of the course had asked all the faculty to let their students know about my presence in the course over the next few weeks, many students were still uncertain of who I was and why I was there. As many different volunteers are continually cycling through the lab from various surgical specialties students are used to seeking help from unfamiliar faces. Two or three times during each lab I had students approach me with anatomy questions. The fact that I was wearing the same white lab coat as the anatomy faculty most likely played a factor in drawing students’ questions my way. My reaction to their questions is illustrated by my reflections in the field,

* I actually kind of dread students asking me questions, because every time I stand there thinking should I answer? should I not? and then noticing that in doing that I’m taken away from observing what I’m there to observe, BUT at the same time not wanting to appear prudish to students or shake them off if I am able to help them out. So far I think my decisions on whether to help students have been based on how quickly I can get back to observing. If it’s a quick question I will go ahead and answer but if they are asking me to come over to their table or get my hands dirty I have to explain that I’m there to observe teaching.

I was also hesitant to reply to students’ questions knowing that the philosophy of teaching for the course was to guide students to discovering structures on their own rather than telling them the answer. I knew I did not have time and that my attention would be taken away from observing if I “Socratically” stepped them through their problem. The lab was the only place in the field where I felt my role as an observer being pulled towards that of participant.
Being my first time in the field there was a lot of learning going on in terms of the research process. It is true that you can read, write about, and plan research methods for months before entering the field. But it is not until you get into the context of the study that the reality of how you are going to go about your work gets fleshed out. I experienced some frustration the first couple weeks in terms of having to re-organize the categories of participants I had conceptualized before getting to Lillian Douglas. Before entering the field I had compartmentalized people given their backgrounds “on paper” which did not always coincide with who they were after meeting them. Thus, a valuable lesson in my growth as a researcher was the art of flexibility as I continually adjusted my questions and focus in light of who and what I was learning in the field. Another frustration stemmed from a tension between what I am interested in and passionate about as a researcher - hearing people’s stories and experiences - and the complexity involved such work. As the data began to accumulate and participants’ stories began to interweave with each other, I became so overwhelmed that my feelings poured out into a poem:

Why make it messy?

Would it not be easier if I had just one set of questions?
Would it not be easier if I asked just one type of person?
Would it not be easier if I could just count how many times?
Would it not be easier if they all fit into one category?
Would it not be easier if they could just check yes or no?
Would it not be easier if I stayed somewhere familiar?
But then would I be asking about their story?
But then would I be hearing their voice?
But then would I be capturing this place?
But then would I be bringing up what we don’t talk about?
But then would I be able to describe their reality?
But then would I be able to understand?
Taking the time to write this was not only a venue to express my frustration but also a way of reminding myself that no, it is not easy, real life is messy, but real life is also meaningful and as a researcher that is what is important to me.

Summary

I used a case study design to carry out this phenomenological study. Three anatomy teaching faculty at Lillian Douglas School of Medicine in the United States were purposefully selected as a case of basic scientists who transitioned to teaching anatomy within an integrated curriculum. The first year integrated anatomy course at Lillian Douglas uses clinical cases as a framework for teaching anatomical concepts with labs covering procedures students will encounter during their clerkship. I spent five weeks at Lillian Douglas during which my primary objective was to gather data surrounding what it was like for basic scientists to transition from teaching within a traditional anatomy curriculum, to one organized by clinical cases and procedures. Faculty and staff who are involved with the integrated course who did not meet the primary inclusion criteria were also interviewed. In addition to interviews, data also included observations of lectures, labs and seminars, as well as the collection of course syllabi, lecture notes, and power-point presentations. Analysis was iterative and ongoing from the start of data collection and included a hermeneutical movement between the data and the process of writing.

To this point you have predominantly heard my voice as I: 1) introduced my research question of ‘What is the experience of anatomists transitioning to an integrated curriculum?’; 2) explained the phenomenological approach I chose to address it; and 3) described how I went about it. In the next chapter there will be a shift in voice to that of the primary participants and their sharing of what it was like for them to change to teaching in an integrated curriculum.
Chapter 4 – FINDINGS

Overview

The experience of these basic scientists transitioning to an integrated curriculum might valuably be likened to the experience of moving to a foreign country. Most of us have travelled to other countries so we have a taste of what it is like to be in a context where we do not speak the language and we need a map to guide our every step. But trying to piece together foreign phrases and getting lost exploring a new city is usually exciting rather than frustrating because we know that in a week or so we will be back in the comfort and familiarity of our own country.

Fewer of us know what it is like to move to a foreign country, where there is no reassurance that you will ever be on your native soil again, especially when you did not necessarily choose to move there in the first place.

This chapter will use the metaphor of moving to a foreign country as a framework for describing what it was like for the three basic scientists at Lillian Douglas to transition to teaching anatomy in an integrated curriculum. As stated by the poet Robert Frost, “all metaphor breaks down somewhere” (1931), and as such, the use of this metaphor is not to say that the participants’ experiences were exactly like moving to a foreign country, but rather is intended to introduce something that readers of this dissertation might be able appreciate in order to understand the experience these anatomists went through.

The chapter is divided into four parts with each part reflecting a different phase of the primary participants’ (Galen, Paul, and Jane) experiences of transitioning to an integrated curriculum. Part I paints the landscape before the move including the background of each of the primary participants and how the first year integrated anatomy course came to be. Part II explores what it was like to leave the “home” of their previous teaching. Part III delves into the experience of first arriving and the process of adapting to the new “country” of the integrated...
course. And lastly, Part IV looks at what continued life is like since the change including the new “normal” of the primary participants’ teaching and tensions that have arisen as a result of the move.

Grounded in phenomenology, the aim of this chapter is to hear the voices of participants in the telling of their experiences. As such it will include direct quotations from interviews with participants. Quotations may include a double dash (--), which indicates a pause taken by the interviewee. They may also include an ellipsis (...), which symbolizes a break in text where words or sentences that did not speak to the theme being discussed were removed. Words spoken by participants are quoted in italics, and following APA (American Psychological Association) formatting, excerpts greater than 40 words are indented and without quotation marks. In addition, as the rest of the dissertation narrows in on the primary participants (Galen, Paul, and Jane) with less mention of secondary participants, when I use the term “participants” I am referring to the primary participants.

Although the goal of this chapter is to describe what it was like for the Galen, Paul, and Jane to transition to an integrated curriculum, some interpretation is inevitable with respect to how I have chosen to frame the participants’ experiences, and which interview excerpts I have selected to illustrate their stories. Greater interpretation of what their experiences mean in light of the phenomenon of transitioning to an integrated curriculum will be the focus of the next chapter.

**Part I - Before the move**

“I got to tell you, you teach a great course. The students love your course … but you know what the problem is? The course is too long and it takes too many resources. And I want you to cut it down.” – Former Dean of Education, Lillian Douglas School of Medicine (as reported by Paul during interview)
The above quotation may sound familiar to those who have been or are currently involved in anatomy education. This section will describe the backgrounds of the three participants, as well as tell the story of how the integrated anatomy course at Lillian Douglas came to be. After reading this section you will have an idea of the road that each participant travelled before coming to Lillian Douglas, and for Galen and Paul, their involvement in developing the integrated anatomy course after being given the mandate from the dean to cut back the course hours.

**Galen’s background**

Galen was classically trained in anatomy throughout his doctoral studies in neurobiology. He explained, “it was an old-fashioned anatomy program in the sense that it had neurobiologists, cell biologists and, of course, anatomists all together and we were required to take basically the first two years, the didactic curriculum for medical students.” His graduate work also provided Galen with his first opportunity to teach as a teaching assistant (T.A.) for neuroanatomy, histology, and gross anatomy.

Galen came to Lillian Douglas for a post-doctoral fellowship in 1976. He noted, “I came here as a post-doc in neurobiology and I’d expected my tour path to be one of a-- neurobiology researcher and a neurobiology instructor.” However, after his two-year fellowship a position in neurobiology was not available - but a position in gross anatomy was. Galen explained how at the time he said to himself, “well, you know, it’s not what I want but I can do this.” So alongside his continued research, he began teaching gross anatomy at Lillian Douglas in 1978.

When Galen began his anatomy teaching career it was in the context of what anatomists or medical educators today would refer to as a “classic” or “traditional” anatomy course. He explained that when he started teaching, the first year gross anatomy course included “48, three-hour labs. And about 30 lectures. So we did exhaustive dissections based on a video series that my
predecessor … had created, but basically it was following Grant’s dissector⁴. And so the course was approximately 200 hours long.” Galen explained that the course “started with eight or nine systemic anatomy lectures, overview lectures. And then we picked up regional lectures as we-- running parallel to the dissections.” Galen provided me with an old course syllabus that gave a more detailed look at how the anatomy course was organized. As show in Table 4.1, looking at how each lab was titled illustrates how the focus was on dissecting the different regions of the body – a layout similar to many anatomy syllabi today.

**Table 4.1 – Organization of the old (traditional) anatomy course.** Titles from the first ten labs of the old course give a sense of how it was organized into various body regions. Please note this is only a sample of the first 10 labs. The other labs continue in a similar fashion covering all of the different regions of the body.

<table>
<thead>
<tr>
<th>LAB #</th>
<th>TITLE</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Vertebral Column and Muscles of the Back, Skin Gluteal Region</td>
</tr>
<tr>
<td>2</td>
<td>Superficial, Intermediate and Deep Muscle Groups, Back and Shoulder Region</td>
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<tr>
<td>3</td>
<td>Gluteal Region and Structures</td>
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<tr>
<td>4</td>
<td>Vertebral Column and Spinal Cord</td>
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<tr>
<td>5</td>
<td>Arm and forearm: Removal of Skin, Superficial and Deep Fascia</td>
</tr>
<tr>
<td>6</td>
<td>Lower limb: Superficial Structures and Deep Fascia</td>
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<tr>
<td>7</td>
<td>Pectoral Region and Axilla</td>
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<tr>
<td>8</td>
<td>Anterior Thigh, Adductor Canal, and Medial Thigh</td>
</tr>
<tr>
<td>9</td>
<td>Arm and Cubital Fossa, Flexor Forearm</td>
</tr>
<tr>
<td>10</td>
<td>Posterior Thigh</td>
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</tbody>
</table>

⁴ Grant’s dissector is a dissecting manual that is still considered the “gold standard” of dissection in many anatomy programs
“Morty”, the manager of the anatomy lab at Lillian Douglas, spoke to the time-honored, classic nature of the anatomy course when Galen arrived at Lillian Douglas. He said,

*The lab would start at 8:30am, the students would come to the lab and watch a videotape of the day’s dissection … then they would do a very traditional anatomical dissection, probably similar to what everyone has done, you know, since the beginning of time immemorial. And that was it. Then-- the course ran a little longer back then, the body was very much dissected at the end, you know, basically skeletal except, you know, it was still together but very traditional … Back then it was very unclinical in that, you know, it was really very much an anatomist’s anatomy.*

Morty went on to explain how the anatomy course was run this way for a very long time. He said for "*many, many, many, many years for probably close to 50 years, 40 or 50 years, the lab was very much the same … the lab was set up that way forever.*"

As the fate has been for nearly every gross anatomy course, Galen noted how "*over the course of time the course got shorter and shorter, lopped off, you know, 20 hours every few years.*" The cutting was being done by the curriculum committees, some of which Galen sat on. He said, "*it became clear that we all had to think hard about what we were teaching and that some of us had too many hours. So this was a time when several significant courses had their hours cut as well. So anatomy, of course, was a larger target than most but still other courses cut back. So we just, you know, cut back and cut back.*"

Galen explained how at this point he was "*it*" in the sense that he was the director of the course and essentially ran it himself. He noted how he "*gave almost all the lectures and did all the testing and did everything for nearly 15 years.*" Galen went on to describe how his solo act would transition into "*more or less a joint venture*" when Paul came to Lillian Douglas in the early 1990s.
Paul’s background

Similar to Galen, Paul was initially trained as a basic science researcher. After completing his doctoral degree in biochemistry Paul went on to complete two post-doctoral fellowships, each at different institutions. In the first he continued his work in biochemistry, but in the second he switched fields to study and carry out research in cell biology. The switch came about when Paul inquired to his supervisors that “you know I’d like to take the cell biology course that the medical students do so I can move into this area.” He explained how their reply was “No, you have to teach it.” So instead of taking the course along side the medical students, Paul began teaching in the lab sessions.

Paul moved into his first faculty position at a university that was interested in both his research and his background teaching medical students. Upon hiring him they said “the catch is, you have to teach anatomy”, and that they would train him as he went along. Paul said he was “staying a chapter ahead of the students literally while [he] was teaching.” Later he was asked to direct the physician assistant (P.A.) anatomy course. Similar to many anatomy departments’ struggles for time and resources, Paul explained how the P.A.’s

didn’t have [much] time to dissect and we had a few prosected cadavers, and the anatomy course previous was pretty lacking. It was a combined anatomy, histology and the teacher knew histology, but not so much anatomy. And it heavily weighted it towards that. So the P.A. program wanted me to shift the balance.

During this first faculty position Paul also began incorporating radiology into the anatomy curricula. Paul said it was a result of working with an MD/PhD student who suggested to him, “you know, if we did this kind of work with radiology in combination with dissection, it would be really powerful.” Paul came to realize the “great synergy” of anatomy and radiology and started to emphasize it more in his teaching. Paul explained how this first faculty position entailed much learning for him. Not only learning anatomical content as he studied to keep ahead of the
medical students, but also experiential learning in being charged to restructure a course and attempting to incorporate new strategies and resources into his teaching and the curriculum. Following this first faculty position Paul moved on to join Galen in the anatomy department at Lillian Douglas.

Paul explained that when he came to Lillian Douglas in 1993 Galen “gave a lot of rope to try new things. And some of the things he didn’t think would have merit or worth. But he was, like, ‘Ah, go ahead and try it.'” Within a context of being free to experiment, Galen and Paul worked together to investigate the use of computers in teaching anatomy and on developing course objectives and mapping them to exam questions. At that time Paul explained that “there were no course wide objectives or objectives for each lecture … what Galen put on the test was his view of what was important. What I put on the objectives [was] my view of what was important.”

Paul soon took over directing the course from Galen. Although the responsibility of overseeing the course had shifted, the two maintained, and continue to maintain, a very close collaborative relationship. Paul stated how when he became director he mapped out “a five-year plan for revamping the anatomy course, as the traditional course, that would incorporate more radiology.” He went on to explain how it was around this time that the wider medical school community started to become concerned that students were not being educated about issues surrounding death and dying. Paul noted how schools across the country were saying, ‘Well, what do we offer about this?’ And Lillian Douglas among them. And when this was presented at a faculty meeting, I said, ‘Well, you know, the first place they see a dead person is the anatomy lab. And they not only have to look at it, they have to cut it apart.’ And so for this astute observation, I was put on a committee.

As a member of the committee, Paul explained how he began interacting more with clinical faculty, specifically those in geriatrics and palliative care.
Stemming from his relationships with those on the committee Paul was later invited to be a part of a group who were submitting a grant surrounding geriatrics education. Paul said,

\[\text{the hypothesis was, that we could integrate clinical teaching from early on. Geriatrics is a subspecialty. It’s-- you’re not required to take geriatrics, at least not at Lillian Douglas. And-- but still, could they build through the basic science years? … We had hoped to get it more into other disciplines. Like, cell biology I think had a few lecturers and physiology we tried to incorporate some things. But you really need someone to carry the flag. And since I was on this, I carried the flag in anatomy.}\]

This experience of working with the geriatricians to try and incorporate geriatrics into the early years of basic science education was a foreshadowing of the bigger changes to come in the anatomy course. In Paul’s words, “now we dovetail with where I had to make the major course change.”

**How the integrated anatomy course came to be**

Paul explained how the dean of education of the medical school invited him into his office and said,

\[\text{Paul I got to tell you, you teach a great course. The students love your course … but you know what the problem is? The course is too long and it takes too many resources. And I want you to cut it down.}\]

Paul replied, “You can’t do this, right. The course is already pretty lean. There’s no way we can get down to 100 hours and so forth. But he was pretty insistent in the way deans can be sometimes.” So Galen and Paul made efforts to cut back the number of hours in the course. Galen said,

\[\text{in the early stages of pruning I thought, well, we’ll just-- we won’t do the soles of the feet as an example. Because it’s hard to do and that used to be two labs, now it won’t be any labs. But we started to feel a little bit self-conscious about, you know, making idiosyncratic decisions, you know, just basically Paul and I deciding, you know, what to cut.}\]
Paul expressed that he “couldn’t just nibble away at the course. It was already a very lean course. No fat, so to speak … we couldn’t stay in the old paradigm, we’d have to say, okay, the kidney’s not important. We won’t dissect it.” Unable to keep cutting content Galen and Paul explained how they came to realize that the only way to get the course under 100 hours was to completely disassemble and reconstruct it. As noted by Paul, it was “an opportunity that doesn’t come around once in a while-- every so often. To get to 100 hours or close to that, we would have to totally tear the course apart and rebuild it.”

Galen and Paul described how the idea of how to rebuild the course came from a visit to another institution’s anatomy program. They had both previously gone to observe and learn about a fourth year anatomy elective that a neighboring medical school had developed. Galen explained that the school they visited had a very short anatomy, traditional anatomy course. But what [the medical school we visited] found was the students wanted more anatomy. So in the fourth year, students can take an anatomy elective, and that anatomy elective is based on surgeries and procedures. It’s a short course, so they don’t do the whole body. But it was structured with a case, with a surgery. So we went and looked at how that was done, and we thought, well, you know, why couldn’t the whole course be taught that way?

Paul concluded, “If we have to cut down the amount of information, we can let the patient tell us how to do it.” Seeing how the elective course ran helped them solve, in Paul’s words, the “conundrum” of deciding what to teach.

With the idea birthed from their visit, the vision of the new course according to Galen, was to change “to teaching that was absolutely directed at what the student needed to know” without abandoning their core aims. He explained, “Our core aims have always been to teach the language of medicine and to teach three-dimensional relations.” The goal was to keep on doing that, but to structure it in a way that was more relevant to the medical profession. As described by Paul the “vision was, you know, let’s get clinical cases. They should be common
clinical cases, anatomy-rich cases. So that when students go on the floors, in whatever venue, they're going to see cases like this." In describing how they envisioned the lab would proceed in the integrated course Galen said,

*What’s the patient’s problem and what’s the anatomy underlying it and, well, since this is anatomy lab, we aren’t going to give you drugs. We’re going to take it out. And so in the context of taking it out, why are we coming in from the right and from the left and if you come in from the right what can we hurt, what’s nearby that can be damaged. So we want to, you know, embed the knowledge and, you know, in a contextual framework that they’re likely to cover.*

Not being physicians themselves, in order to determine what students needed to know and the cases they would see, they went on to rally support from the clinical faculty. Galen and Paul both noted how the dean played a significant role in helping to get clinicians involved. Paul explained how he initially said to him, “*the surgeons are never going to go along with this.*” He said the dean’s reply was, “*I’m the dean. I carry a big stick. They’ll do it.*” So Paul, Galen and the dean proceeded to meet with the section chiefs of all the surgical disciplines, clinicians involved in teaching physical exam, members of the radiology department and some from internal medicine. Paul explained how the surgeons said, “*Well, tell us what you want to teach and we’ll come up with a case.*” He said his response was, “*No, no, no. I want cases that every student has to see. That’s the theory. You learn about it and then you have a clinical experience with it.*” Galen recalled asking the surgeons

*what procedures and surgeries are you involved with that would have important teaching content that also resulted in the body being more or less dissected … what three or four things would you like the student-- you’re doing a cholecystectomy [for example], what would you really the students to know?*

Paul mentioned how different surgeons had different ways of interacting with them, “*but in the end, they all came forth with information and expertise.*” Galen
described how the surgeons were enthusiastic about the idea, “They thought that the whole idea and anything that would be more surgical, would interest people and surgeons and conceivably get more med students to become surgeons. Anything that topped up surgery was good.” At the end of this consultation process, Galen and Paul developed a list of surgeries along with histories and physicals. After meeting with each section chief Paul noted how he gave several grand rounds explaining the vision of the proposed integrated anatomy course and soliciting support from the broader medical school community.

Galen and Paul described how with the clinical faculty on board they went on to write a grant to the Federal Department of Education. The grant was designed to improve secondary education, and as Galen explained “it was a grant written specifically to reorganize an anatomy course based on clinical cases.” Paul noted how he had previously attended a program at the Harvard Macy Institute focusing on leading innovations in health care and education. He explained that in addition to talking about educational theory and providing hands-on experience with different ways of teaching, the program provided him with the skills and the “lingo” to apply for the grant. The grant application was successful and Galen noted how at that point he and Paul were “all in” in terms of being invested in the change of the course. He said,

Once you write a grant you become invested in it. You think it’s a great idea maybe even if it isn’t. So that boundary was crossed quite early for me and Paul because we’d proposed it, so how could we not like it?

With the grant secured Galen and Paul moved on to developing the course. Paul explained how he worked from the clinical cases that the clinical faculty presented to him. He said, “I would work [from the cases] and develop the questions, putting them in place, where did I want students thinking about, as we went through these procedures.” They also worked closely with a radiologist to help compile images for the patients in each case. Paul noted,
We would give [the radiologist] a case that another surgeon gave us, another clinician gave us. He would find the case number and pull out the studies, de-identify them and write an exercise … If we didn’t have the file for this particular case or the case was an amalgam of several cases, he would find a study, a radiographic study that was close enough with it that we can use it. So the cases are all real. The radiology that goes with the cases are all real.

Table 4.2 compares the titles from labs in the integrated course with those from the old course syllabus. The titles are an example of how the framework for teaching anatomy shifted from regions of the body to surgeries and clinical procedures.

### Table 4.2 – Organization of the old course compared to the integrated course

Titles from the first ten labs of the old course compared to titles of the new course gives a sense of how the organization changed from different regions of the body to clinical cases and procedures. As in table 4.1, please note this is only a sample of the first 10 labs.

<table>
<thead>
<tr>
<th>LAB #</th>
<th>TITLE (Old course)</th>
<th>TITLE (Integrated course)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vertebral Column and Muscles of the Back, Skin Gluteal Region</td>
<td>Anatomy of the physical exam</td>
</tr>
<tr>
<td>2</td>
<td>Superficial, Intermediate and Deep Muscle Groups, Back and Shoulder Region</td>
<td>Exploring the body wall via surgical incisions</td>
</tr>
<tr>
<td>3</td>
<td>Gluteal Region and Structures</td>
<td>Mastectomy/Removal of the chest plate</td>
</tr>
<tr>
<td>4</td>
<td>Vertebral Column and Spinal Cord</td>
<td>Pneumonectomy/Sympathetic chain</td>
</tr>
<tr>
<td>5</td>
<td>Arm and forearm: Removal of Skin, Superficial and Deep Fascia</td>
<td>Heart transplant/cardiac circulation</td>
</tr>
<tr>
<td>6</td>
<td>Lower limb: Superficial Structures and Deep Fascia</td>
<td>Thoracic aneurysm</td>
</tr>
<tr>
<td>7</td>
<td>Pectoral Region and Axilla</td>
<td>Abdominal trauma/Colon cancer</td>
</tr>
<tr>
<td>8</td>
<td>Anterior Thigh, Adductor Canal, and Medial Thigh</td>
<td>Foregut: Cholangiocarcinoma</td>
</tr>
<tr>
<td>9</td>
<td>Arm and Cubital Fossa, Flexor Forearm</td>
<td>Renal cancer/Diverticulitis</td>
</tr>
<tr>
<td>10</td>
<td>Posterior Thigh</td>
<td>Inguinal hernia/external genitalia</td>
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</table>
Paul described how the timeline for developing the course was tight. He said,

*I think we spent two years, but a rather short time. And then we had to implement it. It was going to be, you know, by this deadline imposed by the dean. This course is going live. We couldn’t-- we didn’t field test a lot of things.*

When the course did launch it was not completed. Paul explained,

*We were trying to stay several labs ahead. So there was this real mix of, all right, we’re teaching now, and we’re also -- getting stuff ahead, you know, it was the idea that students wouldn’t look ahead to see what was going-- and so we had a lot of, you know, placeholders. And not all of the web activities that we might have had-- that we ultimately had in place were in place.*

What has been described up to this point has been related to the goal of changing the anatomy course to be framed with clinical cases. However, intertwined with the aim of developing the course around what students would need to know as future doctors was a second objective for change in the course - to have the anatomy faculty take on what participants termed a “Socratic” approach to teaching. Rather than the approach in the old course where faculty largely disseminated facts for students to memorize, the goal of the integrated course was to use teaching strategies that helped students develop skills for thinking about and solving clinical problems. As described by Galen,

*Instead of just looking at your radiograph and saying, oh, there it is. It’s let’s step back, let’s really take a look at this … the idea is to get them to start thinking about things systematically, to-- not to memorize things. Though obviously you need a considerable font of knowledge to be able to reason. But-- rather than identifying simply-- visually recognizing patterns of blood vessels, to start thinking about, okay, well, what’s the orientation of the radiograph. Well, where is it going. Yes, now, I’m sure it’s the gastric artery, for example. So I think basically what-- we’re trying to provide them with the tools for reason rather than to memorize.*
In explaining what they meant by teaching anatomy “Socratically” Galen said, 
*in the ideal you’d come to a table and you’d say, well, show me what you’ve got. They’d say, well, we think this is the celiac trunk. You’d say, well, why do you think it’s the celiac trunk? They’d say, well, it’s coming off the aorta. Okay, well, what about the branches? Well, branches-- well, I think this is the splenic artery. Well, what makes you think that and what else could you do to confirm it? Well, that isn’t really going where it’s supposed to, is it. Well, how can we go about really finding it, you know?*

Part of the vision for new Socratic approach also involved students taking initiative for their own learning. Galen explained, 
*it’s the throw them in the water and make them swim … So the idea is that we’re trying to push them towards, what we like to call or-- what is adult learning so that they figure out what they need to know. And then figure out some way to get it.*

To summarize to this point Galen and Paul explained how there were two facets of change with respect to the development and implementation of the integrated anatomy course. First was the change to using clinical cases and surgical procedures to frame the anatomical content of the course. Second was the change to what participants described as a “Socratic” approach to teaching where the focus was on asking students questions to guide their learning and help them develop problem skills, as well as encouraging students to seek out information and find learning resources on their own (Table 4.3). These two facets of change represent how integration was realized in this particular context. Neither is mentioned with the intention of suggesting that this is what the medical education community should be moving towards in order to integrate successfully. Rather, these facets of change are noted simply to describe how integration was manifested in the first year anatomy course at Lillian Douglas.
Table 4.3 – The two facets of change in transitioning to the integrated curriculum.

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<tbody>
<tr>
<td>1</td>
<td>Change in <strong>content</strong> to being framed in clinical cases/surgical procedures</td>
</tr>
<tr>
<td>2</td>
<td>Change in <strong>teaching</strong> to “Socratic” teaching strategies</td>
</tr>
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</table>

As part of writing the grant and in order to help work towards the goal of having anatomy faculty teach more Socratically, Paul sought out an expert in teaching and learning. He connected with “Kyle” who, as noted by Galen,

*was hired many years ago on the main campus because graduate students were being asked to teach. And they weren’t being given any support at all. So he’s the head of … [a] graduate teaching unit on the main campus. So he’s an expert in pedagogy and educational psychology.*

Kyle explained,

*I had been doing workshops of various kinds for the medical school when I first got here … And that’s how I met Paul and we started talking … And so we teamed up. And I agreed to help him turn this traditional anatomy course into [integrated] anatomy.*

With the implementation of the integrated course the core anatomy faculty began meeting every two weeks in order to go over the cases for the labs and seminars. It was during these meetings that Kyle would come and work with the anatomy teaching faculty. Galen said, “*with respect to teaching style, Kyle worked on us pretty hard for about two years.*” Paul noted that the core anatomy faculty (including both basic scientists and physicians), were able to discuss with Kyle in a group context what things were working or not working for them in terms of their teaching throughout the implementation of the course.

At that point Galen explained how in terms of formal education the only true basic scientists teaching in the anatomy course were him and Paul. That would change in 2012 with the hiring of Jane, who was not only a basic scientist, but also the first pair of “fresh eyes” in the course since it was implemented.
Jane’s background

Jane began teaching in the integrated anatomy course at Lillian Douglas two months before my arrival to conduct the fieldwork for this study. Graduating with a PhD in physical anthropology in May of 2012, she was the youngest member of the core anatomy teaching faculty. Despite her young age, Jane came to Lillian Douglas with some anatomy experience. Prior to graduate school her anatomical studies had mainly focused on osteology (bones). She explained, “When I was looking for grad schools I really wanted anatomy. And so I asked specifically at different programs and made sure that they had something.” Her first time studying anatomy beyond osteology was in the second year of her graduate program where she took a comparative primate anatomy course which allowed her and nine other graduate students to dissect one human and four non-human primates.

Jane described how, during her graduate program, an opportunity to teach anatomy arose when a new medical school opened near her university. The anatomy instructor of the new school was looking for T.A.’s and although Jane’s funding did not include teaching, she explained how she decided to take a year off and apply for a T.A. stipend so she could gain some teaching experience. In the first year anatomy course of the new medical school Jane was responsible for one table of six students. The format of course was very traditional in that the professor delivered content covering the various regions of the body, and students were expected to identify structures in a cadaver. Jane noted how she and the other T.A.’s would carry out the dissection the day before the medical students’ lab. Lab time the following day consisted of the professor delivering a lecture and then the T.A.’s demonstrating to students structures they needed to identify in the cadaver. In talking about how the professor conducted the lab Jane explained,
she would, in the middle of her lecture, you know, just basically have slides and have, you know, green dots are this and red dots are that. And then she’d say, okay, take a break and look at it in a body.

The anatomy course went for one semester after which Jane spent the rest of the year teaching a course in her specialty of paleoanthropology. Following her year of teaching Jane spent the next three years completing her research and writing her dissertation.

Jane’s path to Lillian Douglas was led by her husband who secured a faculty position at the medical school. Having recently defended her PhD and knowing she would be living near Lillian Douglas for her husband’s work she approached Paul, introducing herself and inquiring if they had any anatomy teaching positions available. Jane explained how Paul’s reply was that they definitely needed another faculty member but they didn’t have the funding to pay her. She noted how at the time she said to herself,

well, you know what, I either have no job with no pay and nothing to do and I just sit in our apartment … or I have this opportunity where I can get more teaching experience and I get to keep my skills up and I don’t get paid.

So she said to Paul, “Sure. Let’s do it.”

Part II – Leaving Home

“I think-- part of it was a pressure, you know, it’s like, you know, they say in the theatre, you’re only as good as your last review. And another saying is if you don’t change you die.” -Galen

I will start Part II with looking at what “home”, or teaching before the transition to the integrated course, was like. I will then describe the various motivating factors that appeared to contribute to Galen and Paul committing to the move to the integrated course, and how a shift in perspective towards change enabled Paul in
particular to make the transition. Following that, I will consider what participants had to let go of, or leave behind as they moved to the integrated course. Lastly, I will describe Jane’s departure from “home” separately as she was uniquely at the beginning of her career as an academic.

What “home” was like

Life appeared to be good in the anatomy department at Lillian Douglas before the dean set the bar for the first year anatomy course to be under 100 hours. Both Galen and Paul were award winning teachers, the course was well-liked, and student ratings were high. Galen explained, “We regarded ourselves as very popular and very successful.”

In terms of teaching Paul said,

*anatomical content, that was the overriding thing … it was all about how do we learn a lot of details? What are the important details to learn? And then strategies to learn them. And I didn’t really care very much about ‘learning theory’ or that different students learn different things. It was just kind of assumed and, you know, here’s the material, learn it however you are.*

He went on to say that before the change he was of the mind that “if I don’t say it in my lecture, they’ll never learn it ‘cause where are they going to hear it after all? And if I said it, I accomplished my goal.” Galen similarly reflected, “I saw myself as a font of knowledge, that was my job was to tell people everything. And we have so little time-- if I don’t tell them, they’ll never learn it.” He added,

*the way that I thought about it and the faculty did for many years, was that we were training physicians, but we were training people to, at least in anatomy, to think like anatomists. And in physiology they would learn how to think like a physiologist and so on. And that the student would cobble together their way of thinking based on little bits of thinking that they pulled from other things. So we were … more concerned about anatomic*
thought process in the absence of clinical -- necessarily of clinical relevance.

Motivation to leave

So why leave? Paul and Galen were successful teachers in a course that was well liked by students. Galen said the “thought was, well, you know … we’re doing a great job now. The students are learning. Why should we change?” As described earlier in this chapter the cutting of course hours was a major stimulus for change, but what was it that motivated them to step beyond their expertise and into the clinical world in order to reach the sub 100 benchmark?

One motivator appeared to be the fact that Galen and Paul were in the context of a university that values research and innovation. Galen explained,

To be a good teacher in a research intensive university you have to have scholarship which means that you have to design things and try them out and do them and publish them. If you just keep on doing things you don’t satisfy -- you don’t have the same sort of academic rigor that they do in research and so on. So if you want to have any credentials at all as a teacher you have to be innovative.

He went on to say that within a research intensive context “you don’t really have much choice. You’ve got to -- you have to be ready to change.” When I asked what made him ready to change he replied, “Well, I like what I do, and I wanted to be able to be able to continue to do it and I wanted the university to continue to value me.”

There was pressure from the dean, yes, but to get under 100 hours Galen and Paul could have kept on as before, just cutting more and more content. But Galen explained that an eventual discomfort with continued cutting was another motivating factor for deciding to leave the “home” of what they knew. He said,
In the early stages of pruning I thought, well, we'll just-- we won't do the sole of the foot as an example. Because it's hard to do and that used to be two labs, now it won't be any labs. But we started to feel a little bit self-conscious about, you know, making idiosyncratic decisions, you know, just basically Paul and I deciding, you know, what to cut.

He added,

We got to the point where we felt uncomfortable about cutting things, you know, whether-- it's probably not going to be the case. But let's say that we cut the-- that we cut the foot off and suddenly for some reason there was a huge-- there was a huge attack of foot disease and doctors weren't prepared. So, you know, we wanted to be sure that the stuff ... we were going to jettison wasn't critical to their careers.

Similarly Paul explained,

I couldn't just nibble away at the course. It was already a very lean course. No fat, so to speak ... I mean, we couldn't stay in the old paradigm, and we'd have to say, okay, the kidney's not important. We won't dissect it.

For Paul, motivation to change also seemed to come from an intrinsic desire to improve both teaching and learning in the course. To some extent Paul had become tired of teaching anatomy, “it started getting dull and boring actually.” In addition, he started to perceive the course as somewhat lacking, “My agenda was, you know, this is a great course in terms of students love it, but we’re really not effective at what we do, or as effective as we should be.” Upon me asking what he meant by “effective” he explained, “Students were learning a lot of stuff, but the day after the exam they didn’t know a thing. And so how to counter that.” Paul also made the realization that his previous methods of teaching left him without any conception of where students were in terms of learning the material. He said,

It’s easy to get up and give a lecture and then you’re done. You don’t need to know what the students know or don’t know. They laughed at your jokes. They asked one or two intelligent questions. You feel you did a
good job, and you’re done. But you really don’t know anything about what the students do.

Not only was discontent with the previous course pushing Paul towards change, but also a broadened scope of what anatomy education entailed. Perhaps from his time spent at the Harvard Macy program, or possibly from his years of experience teaching in the medical school, Paul appeared to have gained a vision for anatomy education that went beyond parts of the body to professionalism and working in a team. He said,

How do you learn to work with who you don’t want to? That was not a concept that was considered anatomy teaching, right. But now we do consider it part of anatomy teaching … So I had to model that in the lab. In the sense, if I could do it, anybody could do it, right.

One of the factors pushing Paul towards change appeared to be that he could not ask his students to collaborate and work professionally with others if he was not doing the same himself.

Change in perspective

Although Paul’s immediate reaction to the dean’s demand of 100 hours was that it would be impossible, he began to perceive it as a chance to make some meaningful changes. He said,

I realized this was really an opportunity that doesn’t come around once in a while--- every so often … We’re going to start with totally new assumptions. We’re going to build this from scratch … so it was going from that, this is terrible, to hey, this is really an opportunity to getting some insight in how to develop this opportunity.

His response to whether anything influential happened that helped him switch from thinking it was terrible to an opportunity was, “Well, you know, it’s-- it’s to see things as they really are, to let go of any attachment to one way of doing things and it just opens up possibilities.”
Letting go

What Paul and Galen seemed to speak about most in terms of what they had to let go of when leaving the “home” of the old course was related to course content. Firstly, they had to let go of being the only ones involved in deciding what content students needed to know. This entailed having to let go of anatomical regions that they might be particularly passionate about. Secondly, they had to let go of their framework for thinking about the teaching and learning of anatomy; that for students to learn they needed to cover all the content, and that anatomical facts needed to be learnt before they could be applied. Lastly, although anatomical terminology is similar to the language of medicine, they had to leave aspects of their anatomical language behind.

Galen and Paul went from being the only ones involved in deciding what content what included in the course to asking clinicians to give input in terms of what content was important for students to know. Galen explained,

\[\text{from ‘82 to ‘91, I was it. It was me. There were other people, I shouldn’t sound so egocentric, but I was the course director and, you know, I did everything. Not all the lectures but all the major decisions were mine … }\]
\[\text{And I ran it myself, you know, just-- until Paul took over. And at that point he just took over my course content. So it was then-- so it was, you know, all stuff that I’d organized and then when the new course started suddenly it wasn’t.}\]

Galen noted how “ceding the course content to somebody else” was one of the biggest challenges in transitioning to the new curriculum. He added,

\[\text{What do they really need to know? And that was another difficult step because we all like to think that we know what the students need to know, and it’s particularly dangerous when you’re basic science faculty, who haven’t had any clinical experience-- and you think you’re pretty good at teaching. So it’s sort of tough to-- that was a big step for us to go to the people who do physical exam, and the surgeons to say, well, you know,}\]
what three or four things would you really want the students to know?

Paul explained how in his role as a researcher he is used to being in a position of control. He said, “I’m the lab director, I’m the boss. This is what I want.” Similarly, as director of the anatomy program he was ultimately (but largely in collaboration with Galen) in control of what content would be covered in the course. As mentioned previously, what was covered was what he viewed as the most important things. After deciding to frame the course around clinical cases Paul still appeared to be in control in terms of the design of the course, but now turned to physicians to help him decide what students needed to know in terms of clinical content and procedures. In approaching the surgeons he said, “So this is my idea … but, you know, you are the people that live and breathe this. So what do you think?” In explaining what it felt like to let go of being the sole decision maker in terms of content Galen said,

I mean, in some respects it was sort of like with respect of a course, it was sort of sending your kid to college. You were in control of what they knew and suddenly you were putting them into somebody else’s hands.

The content of the new course being informed by what clinicians deemed important meant that some anatomical areas would not be studied in the same amount of detail, and in some cases not at all. The result was that the anatomy faculty had to let go of content areas they were particularly fond of. Paul explained,

I don’t think I’ve ever met an anatomist who knew of an anatomical structure that he or she did not love. And that’s a problem. It’s just like the research scientist in biochemistry giving a biochemistry lecture about his or her research and not what the student needs at that particular time. So it’s the analogous problem.

Galen mentioned that one of the challenges was “the fact that we weren’t going to talk about things that were near and dear to our hearts.”
In addition to letting go of being the sole informants of what content was included in the course, as well as anatomical areas they were passionate about, Galen and Paul also had to let go of their previous framework for thinking about the teaching and learning of anatomy. This included abandoning the mindset that in order for students to learn they had to cover all of the content. Galen explained how “not telling students everything you know” was hard. He said,

So to not have all those labs and to only be able to spend, you know, two labs on the lower limb, two labs on the upper limb, that was tough … And the concern was, well, you know, wait a minute, we’ve always spent, you know, four or five labs on the neck, you know, how will they-- how they can possibly learn the neck if there are just two labs? And-- so various people, including myself, were, you know, were upset about the amount of time that got allotted for example.

He went on to explain,

We had to break ourselves of the fact that students do just fine, you know, given guidance and direction rather than, you know, being a recipient of huge chunks of knowledge … So having to leave a session without a-- giving them a critical bit of knowledge, simply because, you know, it’s too much. Having some confidence that they’ll pick it up on their own.

Beyond letting go of the need to cover content, the shift in Paul and Galen’s framework for thinking about teaching and learning anatomy also involved the question of when anatomy should be taught in relation to clinical learning. In the old course anatomical knowledge was taught first and then later applied when students went to teaching hospitals. Paul explained, “Before you couldn’t have discussions unless you had the facts. And so you had to learn the facts first.” In describing the initial reaction to framing anatomy in the context of a case Galen said,

The idea that you couldn’t-- that the clinical framework was just not adequate. That students needed-- you started talking about a splenectomy right away, their history and physical. There’d be words they don’t even
understand. How can they read a history and physical when they’re--
they’re just first-year med students? They shouldn’t be looking at that until
third year.

Despite much similarity between the language of anatomy and the language of
medicine, anatomists have a historically rooted lexicon that appeared to be left
behind in the transition to the integrated course. This is related to the fact that
some anatomical structures have both an anatomical name and an eponym (after
the person who discovered it). In general, physicians tend to use eponyms,
where anatomists tend to stick with the Latin or Greek name of the structure.
Galen explained,

We anatomists stubbornly refuse to use eponyms. So despite the fact that
everybody else in the world calls it Poupart’s ligament, we call it the
inguinal ligament. And we’ve try to break ourselves of that I guess
anatomists for years have-- regard that as sort of slang, street language.
Even though it’s the language of medicine.

Letting go of these things – being the sole informants of content, anatomical
regions they knew and loved, how they thought about the teaching of anatomy,
and the language of anatomy – appeared to stir up some emotions. Galen in
particular explained how it was hard and included a sense of loss. He said, “Well,
I mean, there was a certain amount of, you know, sorrow for abandoning the old
way. Because I thought, you know, I was pretty good at it.” He went on to
describe how there was some fear in letting go because the course was well
liked by students. He said,

You know the fact the course was-- that it was very popular. Prior to that
that was the other-- little scary thing because, you know, we had very high
student ratings and obviously you can’t be driven by what students say.
But, you know, you’re always fearful that somebody’s going to say you’re
terrible. Somebody will pull that up at promotion time or something.
Paul explained that a problem in moving forward was the fact that “people like to be liked, right, they want those nice student feedbacks.” Galen also expressed a feeling of apprehension about being in the later stages of his career. He noted, 

_The older you are, the harder it is to change. And we were all fairly-- we’re all-- were old then and we’re still old. So that was-- and some people, you know, are just receptive to change and will go along. Other people aren’t. So I was concerned about that._

Paul spoke to how explicit Galen was about the difficulty of change. He said, 

_This is a man who won teaching awards and had a successful way of doing things. And-- but he recognized things had to change. But it was hard. And so he would say faculty development meetings I’m struggling with this. I see I need to do it. I’m struggling. And others could say, well, all right, he’s making the effort. He sees it as hard._

Galen described how one of the factors that helped them leave their old ways of teaching behind was Kyle, the pedagogical expert who facilitated the faculty development sessions. He said, 

_I think having Kyle there, having an educational-- a person with very good interpersonal skills. A person who understood running a-- someone said, you know, getting faculty to do something is like herding cats. So he was very good at herding cats. Keeping us on topic and really convincing most of us that if we could just give up some of what we held dear, that we’d be more effective._

**Jane’s departure from “home”**

Jane’s positionality with respect to her experience of transitioning to teaching anatomy in the integrated course differed from Paul and Galen’s in two respects. First, in that she joined the faculty almost eight years after the new course was implemented and was therefore not involved with any of the planning or
development. Second, in that she was in the early stages of her career as an academic.

Despite these differences and the fact that she had only taught anatomy for one semester during her graduate degree, Jane still spoke about the difficulty of letting go of anatomical detail; detail that she perceived as essential. She explained,

\[
\text{it's hard when I think anatomy is the coolest thing ever, and I love learning all of these details, that it's not their favorite thing for all of them and they aren't going to need it when-- something that I think is so important.}
\]

Rather than external pressure from the dean or from feeling the need to be innovative within the context of research university, Jane's drive to move into the clinical world appeared to be motivated by her wanting more experience teaching as well as her enthusiasm and excitement for learning something she is passionate about. She noted,

\[
\text{I love this stuff. I want to learn it, like, I look at [the other faculty] and I want to know what they know. And I know that it's going to take time and that's fine. But I love anatomy. It makes me really happy. And it's super fun. So I'm really happy to be here.}
\]

**Part III – Arrival and enculturation**

\[
\text{I was working with one physician, with two actually of-- with the limbs. And the one said, “You know, I teach my students all about these tests, but I don't know the anatomical basis.” And so I quoted something out of an anatomy text about an application. And he said, “You know, I really don’t see any patients like that. Let me tell you what I do see and then we can build-- talk about the same principles, a similar-- way. -Paul}
\]

Part III will take a closer look at what the initial immersion in the “new country” of the integrated course was like. What did it feel like, and how did Galen, Paul and
Jane go about adjusting to the clinical world that was now the scaffold of their anatomy teaching? I will start with a brief description of what it felt like to “arrive” in the context of clinical cases. Then I will spend the majority of the section describing a process of enculturation that each participant went through. By “enculturation” I mean how Galen, Paul, and Jane adapted to the context of the integrated course. Adapted with respect to the two facets of change - to teach anatomy in a clinically relevant way, and to transition to more “Socratic” teaching strategies (Table 4.3). I have interpreted this phase of enculturation as a process of learning. Learning the clinical aspects of the course appeared to involve 1) the work of self-study, 2) an effort to collaborate with clinicians, and 3) an attitude of humility. As illustrated in Figure 4.1, these three facets of learning seemed to be interdependent and worked synergistically to enable the participants to take on the new clinical content of the integrated course. Similar to learning the medical aspects of the course, learning a different teaching strategy was also facilitated through collaboration. Rather than collaborating with clinicians, however, learning a different perspective on teaching involved tapping into the expertise of a pedagogical expert and (for Paul) attending a program offered at the Harvard Macy Institute.

**Arrival**

There appeared to be an array of different emotions when Galen, Paul, and Jane were first immersed in the clinical world of the integrated anatomy course. Generally their feelings seemed to resemble what most of us experience when trying something for the first time. Excitement and intrigue mixed with uncertainty and anxiety.
Figure 4.1- Three aspects of learning the clinical. Learning the clinical components of the integrated anatomy course involved the work of individual study, collaboration with clinical faculty, and an attitude of humility.

Paul emphasized being more enthusiastic than nervous when landing in the clinical world. “Oh, it was very exciting. It turns out the way clinicians use anatomy is ever so much more interesting than what anatomy textbooks claim to be the way they use anatomy.” Amidst the excitement however was a mild feeling of uncertainty in terms of using the language of medicine for the first time. “Well, there was a little self-consciousness of am I pronouncing the terms correctly and is this the right usage.”

Similar to Paul, Galen described the clinical world as interesting, but he also expressed feelings of anxiety, especially when it came time to use his developing clinical language in his teaching. He said,

[When] we first started the lab was when it became a little frightening. Because we had to start, you know, in pre-lab we had to start talking about, well, what’s our patient’s complaint. And so that was a much
different way of, you know, the old pre-lab used to be, well, listen, here we go, these are the things we got to find, let’s go … I was actually pretty worried about it because, you know, I’d never done it before and I wasn’t sure I’d be any good at it.

Galen also spoke about feeling “a little uncomfortable” with the surgical tools that had replaced the standard dissecting kit that he had used for over thirty years. He went on to explain,

in some senses, it was very reminiscent of my first couple of years as a-- back in the late ‘70s, reminiscent of my first years as an anatomy instructor. I was anxious. I didn’t know whether I’d be able to do it … So it was just-- it was basically, not literally starting over, but it felt like it.

Being at the start of her anatomy teaching career Jane described having similar feelings of anxiousness. However, unlike Galen who was only wrestling with the new clinical aspects of the course, Jane’s fear seemed to span her uncertainty of both the anatomical and clinical components of the integrated course. She explained, “Right now the labs are a little bit scary because I’ve never dissected the abdomen and pelvis … and so this is going to be a big week for me and I’m nervous.” Compared to the lab, Jane described how the open ended clinical nature of seminars instilled her with even more fear. She said,

I feel like I’m spending hours and hours and hours and hours preparing for lab but seminars feel like they’re way scarier. Just because, you know, there’s no real set curriculum. The students are given a case or maybe two cases with some background reading and then I’m just supposed to go in and we’re just supposed to discuss.

Jane’s feelings of anxiousness are understandable as nearly everything was new - she had just moved to a new city, the university was new, her colleagues were new. In reflecting on her first meeting with Paul where he showed her the online resources for the course she explained, “I was nervous because I haven’t been in an anatomy mindset for a couple of years because I’ve been doing my dissertation which is not anatomy teaching.”
Learning the clinical

The process of enculturation to the new course involved not only learning the clinical cases and the language of medicine, but also learning a different approach to teaching that was more “Socratic”. In this section I will focus on the former as framed by Figure 4.1, with learning including the work of self-study, an effort to collaborate with clinicians, and an attitude of humility. I will start by describing how Galen, Paul, and Jane did have some clinical knowledge to begin with. Then the three aspects of learning the clinical content of the integrated course will be considered (Figure 4.1), followed by a description of what the process of learning the clinical aspects of the course was generally like.

Foundations

In learning the clinical aspects of the course Galen, Paul and Jane all had a foundation of anatomical, and to some extent clinical, knowledge to begin with. Although Jane had less experience, they had all spent time learning and teaching anatomy. Jane spoke of how her anatomical knowledge was like a base that clinical knowledge could be built on. She said,

\[ I \text{ had confidence that I had enough of an anatomical background that I could review that stuff very quickly and add the clinical component with a, you know, a minimum of additional time … I still am approaching it as ‘as long as I know the anatomy I can add the clinical stuff.’ } \]

Like anyone who has taught anatomy for several years, Galen and Paul were not without exposure to the clinical world. Nearly every anatomy course, no matter how traditionally the curriculum is organized includes clinical examples or uses one of the mainstream anatomy texts that provide clinical correlates for each anatomical region. Galen explained that because of this it was not as if he was starting from square one when having to learn the clinical content of the new course. He said,
I think along the 36 years I’ve been accumulating clinical stuff and there was just not an opportunity to talk about it. So it wasn’t as if I came up, you know, I— appear naïve into the clinical— into the clinical situation … I already knew it; I just needed to think about it in a different way.

As anatomical names and relationships constitute many of the words in the medical lexicon it was not like learning an entirely new language from scratch. Galen explained, “Well, I mean, some of those words you know are words that I simply knew.”

Self-study

Transitioning to the new course required a certain amount of individual study in order to learn the more foreign clinical aspects of the course. Despite having somewhat of a clinical knowledge base Paul and Jane described a sense of uncertainty in exactly how to go about learning clinical information, and what resources to use. Paul explained having some difficulty navigating surgical texts in the early development of the course. He said,

If you look at a surgical textbook it has very little about how to dissect. It has very little about how to do a procedure. Thick tomes talking about all the things that you need to do before you go to surgery and all the things you need to do after— very little about the surgery. That was difficult for me to appreciate or it wasn’t readily apparent to me. What I had to find was anatomical orthopedic surgery, anatomical this or that. Those were the books that had the procedures in it. The general textbook of surgery barely mentions anything about it.

Uncertainty in how to go about learning the clinical aspects of the course was most salient for Jane. She explained,

What I would like to know is more details about all the clinical things. But I just don’t know how to learn. Because I haven’t done these procedures ever … I don’t know how to learn clinical stuff except by Wikipedia which I know is not the best source in the world.
Although there was some uncertainty in how to approach learning clinical information Galen, Paul and Jane employed many useful learning strategies and utilized different resources including working through the material as if they were students, using various websites and online programs, as well as practicing with family members or in the context of other courses.

A learning strategy mentioned by all the participants was to work through the labs or seminars as if they were a student. As described by Jane,

*bascially, you know, I just go through what the students go through. And then take copious notes and do, I think, probably a lot more prep than the students do in terms of looking up every single word that I don’t know… And then they give you the clinical case with all of the jargon and so I spent a lot of time just looking up what’s JVP and blah, blah, blah.*

Galen similarly spoke about how he would go through the cases as students would and then use other resources to look up things about a disorder.

Although both Paul and Galen mentioned the use of surgical textbooks, online resources including radiology programs and clinical websites appeared to be the most utilized resources for self-study. In talking about learning radiology Galen explained,

*I just spent a lot of time with the programs that gave-- had a program I loved that allowed you to scan the body in any plane, except it was unlabeled. There were no labels. So you had to figure it out.*

This was especially the case for Jane in that all she had in terms of books was anatomy texts leaving her with the internet as her only clinical resource.

As is usually the case when taking on something new, learning entailed practice. Paul described how learning the clinical language was much like learning French and he would sometimes rehearse using clinical words and phrases at home. He said, “I’d practice on my wife without her realizing it. And she said, ‘Paul, just speak English.’ I said, ‘No, but I got to learn how to use these.’” Where Paul
spoke of reiterating clinical words with his wife, Galen had the opportunity to reiterate clinical material between different anatomy courses. As Galen teaches both the P.A. (physicians’ assistant) and medical anatomy courses at Lillian Douglas, he described how having extra practice was helpful to learn the clinical content. He said,

*What made it somewhat easier for me was that … I’ve been able to do it twice because of the P.A. course. So I got twice as much practice. At the same time, I mean-- yesterday, for example, we did the perineum in the P.A.s and we’ll do it tomorrow for the meds. So I had a chance to rehearse.*

**Collaboration**

An essential element of learning the clinical aspects of the course appeared to be collaboration. Participants were in a context where they could interact with both the core anatomy faculty who are also physicians, as well as the visiting surgical specialists who volunteer in the lab.

Each participant spoke to how an invaluable strategy for learning the clinical aspects of the course was being able to ask clinicians questions during faculty meetings. The clinicians who regularly attend faculty meetings are those who are members of the core anatomy teaching faculty. As explained in Chapter 3 (Methods) these are surgeons (both retired and practicing) who have a more involved teaching role in the course than the volunteer surgical specialists who only attend labs. Galen described how the faculty meetings, “*started in earnest when the new course started because we had to go over the cases and at that point that’s when we asked the clinical faculty a lot of questions.*” These meetings were, and continue to be scheduled for one hour before every lab. Galen explained, “*the faculty meetings with the various surgeons … they were a great resource. To be able to sit around the table and having [the surgeons there], you*
know was very -- was indispensable.” In talking about a typical meeting Galen went on to say,

Normally there [is], you know, a kind of round-table discussion of the course and, you know, [all the surgeons] have all done all kinds of abdominal surgery and so, you know, we can ask them and sometimes they'll ask us a more theoretical question. So that’s extremely helpful. Jane was particularly thankful for the meetings as a chance to affirm what she had learned during her prep for the lab or upcoming seminars. She said,

[The faculty meetings have] been extremely helpful because it’s basically right before lab and they can just say, okay, this is, you know, all of the stuff that we’ve encountered before and I can say, in my prep these are the questions that I still have.

In the lab Galen, Paul and Jane were teaching amidst not only the core anatomy faculty with surgical backgrounds, but also visiting volunteer surgical specialists. Paul explained how during the implementation of the course hearing the surgeons talk and interacting with them was essential for learning the clinical components of the course as well as continuing to develop the cases. He said,

Clinicians would come into the lab and I’d eavesdrop on their interactions with students … and when I had questions I’d pull them over and ask my questions. And so that first period was a lot of refining-- revising the text as I learned things while doing it-- while working with clinicians.

Galen similarly described how “eavesdropping” on the radiologists helped him learn. He noted, “I've learned a bunch from the radiologists just listening to them talk.” Beyond just listening to their words, Paul explained how being able to observe clinicians using the surgical tools helped him gain a sense of how to properly use the new instruments. He said,

When the class got going and I’d watch the faculty, how they were using the tools. And with ENT [Ear, nose and throat – surgical specialty] we work a little closely with their training program and I’m watching the chief
resident show the intern how to use the tools, you know, how to do a procedure. So you just pick it up like that.

Paul and Jane spoke to how listening to how clinicians explain something of clinical relevance to students enables them to teach that concept in the future. Paul said,

*If I see something that’s clinically interesting, I’ll say, let’s get a clinician over here to talk about this a little bit … And I’ll often listen in so that if I encounter that thing again, I can talk about it a little bit.*

Similarly Jane explained, “as soon as that radiologist explains it to one table, I can go explain it to all the other tables.”

Being able to listen, observe, and ask the clinical faculty questions seemed essential, but Jane explained that for her the most helpful resource for learning the clinical components of the course was hearing the surgeons tell stories about their experiences as physicians. She said,

*In terms of the clinical aspects, the people I’m learning the most from are the surgeons … It’s all just anecdotes that really bring this all to life for me … I would prefer to just be able to sit and listen to [them] tell stories, because I find that my brain retains that sort of-- the way that [they] can just say, vagotomies-- you would never ever do. It’s totally an old-fashioned thing or the celiac nerve block-- like, these things-- that information sticks in my head. Whereas if I just see an article that’s, like, this is the, you know, the rate at which celiac nerve blocks are considered effective or whatever, like that.*

The presence of physicians in the course seemed to bring not only an indispensible outlet to ask clinical questions, but also a resource to verify the medically related content the basic scientists teach. This was captured by Galen when he said,

*when I see a clinician that I have confidence will give an understandable and short answer, I often, for instance, with “Peter” [one of the core
anatomy faculty with a surgical background], I'll ask him-- I'll start something, I'll say, 'Well, Peter, isn't that right?' And so it's reassuring to have somebody with a clinical background as well just to, you know, to either make me feel more comfortable or make the students feel more comfortable that what I'm saying is relevant.

This reassurance or sense of security that clinicians bring to the course is particularly apparent when they are not around to ask questions, as in the case of seminars. Jane explained,

The seminar has been, I think, the scariest part for me. The lab is one thing because, you know, there are always surgeons floating around and I can always say, I'm perfectly open with the students, that I am not a clinician. I don't know a lot of clinical stuff. So if you have clinical questions we're going to go find a clinician … But in seminar, it's just me and my 20 students … two hours of just me being in charge and it's extremely clinical … in the lab if somebody brings up a question I have all of these other people around who can answer for me. Whereas in seminars I feel like I'm kind of-- I'm the only one. I'm all by myself. I don't have anybody else that I can turn to when somebody asks a question.

As the focus of this study is on the experience of the basic scientists, collaboration has been referred to with respect to Galen, Paul and Jane learning through their interaction with physicians. Worth mentioning briefly is that learning between the anatomists and clinicians appeared mutual. Paul explained how working with a particular clinician on developing materials for the course informed both of their teaching practice. He said,

The surgeon said to me, ‘Look, I know you anatomists know what nerves go to muscles and I don't doubt it at all. But for my money, this is the way we think about it.’ … after we worked through and developed a web activity, he ended up saying, ‘Wow, now I know why it is I do what I do and I can better teach my residents.’ And I had a way to narrow the world, the universe, for medical students.
Humility

What largely enabled collaboration and therefore learning to occur appeared to be the basic scientists’ attitudes of humility. By “attitudes of humility” I mean that Galen, Paul, and Jane were honest and explicit about the limit of their clinical knowledge and were willing to seek the help of physicians when needed. They also reflected attitudes of humility in how they readily accepted feedback in times when they might be uncertain in their clinical understandings.

Galen best captured what I mean by “humility” when he said, “I think most of us have reasonably small egos. So that if I don’t understand something, I’ll just-- I’ll go ask them [clinicians] and they’ll tell me.” All the participants were willing and open to talk about moments where their knowledge ended or when they were wrong. For example, Paul shared how he does not “know the first thing about homeostasis”, Galen explained how so often even he says “it’s the aorta and discover[s] that it isn’t,” and Jane admitted that “microscopic stuff [she doesn’t] know anything about.” They each spoke about how when they come to the limit of their knowledge they have no hesitation to seek help from the clinicians. Paul spoke about how Galen “has no shame about saying, hey, can we get a clinician here?” Jane similarly mentioned how she has no problem admitting when she needs help. She explained,

sometimes I don’t figure it out instantly on the spot if [students] come up with questions I haven’t thought of. But they’ve [students] been very patient with letting me say, ‘I don’t know. I’ll get back to you.’ Or, ‘Go ask a surgeon.’

Beyond their honesty about the boundaries of their expertise, the participants were also humble in their willingness to receive feedback. Paul in particular described the importance of not being discouraged when someone offers constructive feedback. He said, “If someone corrects me, you know, and they always do, it’s-- you just can’t be bothered with that. If someone corrects me I
say, oh, yeah, you’re right.” Paul went on to explain how being able to receive feedback was especially important throughout the development stage of the new course. He noted,

*I certainly had any number of clinicians saying, you know, Paul, you’re going down the wrong track. We don’t do things that way, you know, so forth and so on. That’s fine. That’s great feedback. I can adapt to what I am doing that fits in … One case I made up entirely on my own, and the clinician said, ‘Well, you know, we really don’t see it this way.’ I said, ‘Great. What do you see?’*

Nature of learning the clinical

I will close this section on learning the clinical aspects of the course by considering the nature of learning that occurred when Galen, Paul and Jane were first immersed in the clinical context. By “nature” of learning I mean what was this process of learning the clinical aspects of the course generally like for them. In Galen’s words it was “on-the-job training”. As Paul and Galen were still in the process of developing the course materials, they were working to stay a week ahead of students. Jane mentioned how her learning usually occurred days before labs or seminars. Paul described how learning occurred “on the fly”, and Jane similarly expressed how much of her learning in the lab was happening “just in time”. She said,

*I feel like my brain is very sticky. And so as soon as somebody tells me something or I see it, I can remember it and pass it on. But I feel like that’s happening five seconds before I need to be relaying information … the only way I’ve gotten through lab without, I think, crashing and burning is that if I hear something once, I stick it in my head, and then I turn around and I parrot it back to somebody else.*
Anyone who is a teacher knows that the first iteration of a course is always the hardest. It takes time, it is hard work, and it is exhausting. The participants described how the time devoted to learning during this period was significant. Galen said, “when I was learning it the first time I spent three, four hours a day”, and Jane said,

_ I would not mind spending 10 hours a day prepping … I feel like as soon as the semester started till now, I really haven’t had much breathing time, like, every day it’s, like, okay, what’s on the list to slog through today? … Because I just-- I’m so new to everything._

As she was still in the midst of learning the clinical content for the first time Jane looked forward to future iterations of the course where she anticipated things to get easier. She said, “I think next year it’ll be easier because I will have heard it all once and I can sort of take a little bit more time and take a deep breath. I don’t know. The first time’s always the hardest.”

Despite the first iteration of the course being a lot of work, Galen, Paul and Jane explained how they did not find learning the clinical components of the course unmanageable. It was hard work, yes. But they were largely motivated by the fact that they found the clinical content exciting and interesting. Jane noted,

_ The thing is there’s no good way to do this. It’s just a lot of work … [but] as long as you’ve got the anatomy I think the picking up of the clinical stuff is fairly straightforward … It’s taking me longer. Because I have to both prep just for the gross anatomy stuff and then I have to go look up all of this clinical stuff. But I enjoy it._

In describing how she dealt with the course being so clinically based she said she did not have a problem with it because of her interest in “clinical stuff”. Paul spoke about his similar enthusiasm for learning the clinical content. He said,

Oh, it was exciting. It was very interesting, you know, and I was talking with my surgery colleagues or talking with the medical students trying to get a handle, as I mentioned, looking at [websites] to try and fill up the-- fill in the gaps between what the clinicians were telling me and drawing
conclusions and having clinicians say, well, you know, that’s not really quite right. And refining in that way. So for me it was an adventure … As I said, the way clinicians actually use anatomy was much more intriguing than how I imagined that they used anatomy. So for me, it was fine.

The fact that they took pleasure in learning the clinical content appeared to make the components that were somewhat challenging easier to tackle. For example, Galen explained how he found learning the radiology difficult but at the same it was fun. He said, “I like it. So it was hard work, but enjoyable.” According to Paul, the key to making the clinical content easy to learn is to approach it with an open mind. He said, “Mastering the material was not that much, you know, all you have to do simple. All you have to do is give-- abandon all your prejudices. And just go with beginner’s mind. And-- I just didn’t find it that difficult.” Galen expressed how he believes the clinical content is manageable given that you have some assurance in your learning abilities. He stated,

You have to have confidence in your ability to learn. And figure that you’re at least as smart as your students and, you know, and a colleague of mine in physiology said, well, you know, if you expect students to learn it, you should be able to learn it yourself. So the idea is it’s not like quantum physics. I mean, it’s something that you can actually master.

Learning a different teaching strategy

The participants’ experiences of transitioning to the new course involved not only learning the clinical content, but also taking up a “Socratic” teaching strategy. Similar to learning the clinical components of the course, learning a different teaching strategy involved collaboration and seeking external expertise. This included inviting in and working closely with an education specialist, and for Paul, attending the Harvard Macy program for medical educators.
Faculty development

As previously mentioned, Kyle is the head of a graduate teaching unit at Lillian Douglas and primarily works to support graduate students in their teaching. Paul described how Kyle is not only a teaching and learning expert, but also has the interpersonal skills to help others transition through change. He said, “Kyle is much better at feeling your pain, going in, let’s talk about teaching and all of that. And help people discover for themselves why this is a better way.” Kyle started working with the core anatomy teaching faculty during their faculty meetings when the integrated course was implemented. Thus, faculty meetings were not only a chance to ask questions about the cases, but also a time for faculty development surrounding teaching skills and strategies. Galen and Paul described how during the meetings they mainly worked on how to facilitate group discussions and engage students. Paul explained,

*How do you invite someone to speak who isn’t speaking up? How do you get someone who’s doing all the talking to slow down? These are important skills. And they’re not readily acquired, so the faculty development program was really working on these kinds of skills.*

Similarly Galen said,

*So we talked-- well, how did the seminar go? Well, how much time did you talk? Well, do you think you talked too much or too little? Did the students-- how did the students respond? Did all of them talk, or just a few of them talk? So working through the mechanics of-- we spent most of our time on the seminars. How they were working, how-- what we planned to do next, or what did you do that you thought that worked? So it was a lot of sort of carving up and fine-tuning that was-- it was important … So the whole managing-- managing small group discussions was something that we needed a lot of work with and that’s where Kyle … Yeah, Kyle helped us a lot.*
Paul explained how his experience in terms of learning a new approach to teaching was somewhat different than the other faculty members in that he had an opportunity for pedagogical growth prior to the faculty development meetings with Kyle when he attended the Harvard Macy program. He stated, “I wouldn’t say that the faculty development program helped me become a better teacher, because I went through that process in another way with the Harvard Macy program.” Paul described how the program involved being immersed in literature beyond medical education and how these different areas of literature played a significant role in shaping his teaching. He said,

*Harvard Macy is an education program for medical educators. And a lot of the readings and stuff came from the law schools and business schools because in terms of pedagogical theory and so forth they’re way ahead of us than the medical realm. And so that had a huge impact on my teaching. And a lot of reading that came afterwards … post-Macy there was continuing reading of the literature.*

Although he had somewhat of a “head start” in terms of learning about teaching, Paul expressed how he underwent a large amount of personal growth from working with Kyle - mainly in developing his leadership skills and learning how to approach change. He said,

*The changes in me during this period of faculty development for the others was more in directing the faculty -- how to be a better course director. Not just putting the syllabi together but directing the faculty. It was more negotiating with other elements in the school to help me develop a new program. Was negotiating with folks that would eventually come to help teach in the program.*
Part IV – Life in the new “country”

It’s just become second nature. It’s what I do. – Paul

You just feel a little bit uncertain. I mean, as if you’re, you know, as if I’m not really qualified to say it, but I’m just saying it anyway. – Galen

Part IV will look at what it is like to live in the “new country” of the integrated course. I will first describe how Galen, Paul, and Jane’s teaching has changed. Then I will consider the nature of the clinical knowledge the participants have acquired and use in teaching anatomy through clinical cases. Lastly, I will describe a tension that appears to be rising in the integrated anatomy course.

Teaching now

In this section I will look at each participant’s experience of teaching in the integrated course. Although some commonalities between their stories will be mentioned, the focus will be on each of their new realities after coming to “live” in the integrated anatomy course.

Galen

After teaching in the integrated anatomy course for nearly eight years Galen reflected on how different aspects of his teaching have changed to varying degrees. He described how some areas of his teaching are very different, others drift between old and new, and some did not change at all.

The most significant change Galen identified was a departure from his former “font of knowledge” self who felt the need to tell students a certain amount of anatomical content, to a guide or facilitator who tunes into where students are at in terms of what they know, lets them talk, and focuses on clinically relevant
anatomy. Of all the anatomy teaching faculty, I observed that Galen’s pre-lab talk was usually the shortest and always started out with, and largely focused on, the patients in the cases. Galen noted,

*My lab intro, which is not to say that it’s perfect is, what’s the-- what’s our case today? What are the symptoms? Why do we have the symptoms? What are we going to do about it? Let’s go. So I try to keep mine to five or ten minutes at most.*

He went on to explain how talking less has been a challenge. “Getting people to talk and not talking myself as much was a particularly tough one, because, you know, we all like to lecture. So just letting people work through things is-- has been tough.” Compared to before, Galen expressed how he feels his teaching is now much more connected to the clinical context. He described how his new “clinical store of knowledge” is what enables him to bring together the anatomy and the clinical context. He said, “I always try to think about clinical relevance in terms of-- for every structure that I can, I try and give them a little tidbit of why they should know this from a clinical point of view.” Another notable change Galen mentioned with respect to his teaching is that he takes more initiative to find out where students are at in terms of their knowledge and understanding so he can then better meet their needs. He stated,

*if someone ever asks me, what’s the most important thing about teaching. Actually there are two most important things. The most important thing is to know your subject and the second thing, which is even more important, is to know what the student knows. And figure that out at some point.*

Galen explained that in labs and seminars the way he “figures that out” is by eavesdropping on students’ conversations and getting a sense if they are working in the right direction. In lecture I observed how he gages where students are at by using clickers and an audience response program.

Galen expressed how in transitioning to the integrated course he made a definite change from spending most of his time lecturing students about anatomical content, to focusing on cases, clinical relevance, and being more attuned to
students in the new course. A change he mentioned as being less definite in terms of his teaching was with respect to being more Socratic in his teaching. He described how sometimes - what he termed his “best days” - he tries to probe the students with questions in order to guide their discovery of structures. But other times he admits that he does not. Galen noted that being Socratic has “been tough for a lot of people including me.” He went on to say, “I’m not as good at it as I should be because it’s been hard for me to break the -- of it. But in the lab I try to ask more questions.” Galen’s effort to teach Socratically in the new course is contrasted with his habit of reverting to just pointing things out to students and giving them the answers as in the old course. He noted, 

I still find things in the lab. I think I have a tendency to-- in the lab especially not to let them struggle and just find them for them. And I probably do that more than I should but that’s just something that I’ve continue to do.

Jane affirmed Galen’s tendency to point things out for students when she explained, “Galen is more-- I don’t know, he kind of gets in there. If somebody asks where to find something, he kind of just goes in and finds it for them.” At times, however, Galen explained how it is necessary to point things out. He said, “Sometimes you arrive at a table, for example, and they’re just completely lost. Where they just haven’t found anything. And if you start asking questions it’s not going to be productive.” He also described how his decision on whether to utilize a Socratic method or just give answers depends on the student. He said, 

You get to know the students and some students can deal with ambiguity. So you can just give them an ambiguous answer and let them sort it out. Other students get really angry. So you sort of have to work slowly on them. Tell them almost the whole story. So you need to, you know, to do the Socratic method properly you need to understand body language.

Despite the presence of surgical instruments in the lab since the new course began, Galen expressed how one aspect of his teaching that has not changed is his dissecting. As previously mentioned, Galen noted how the new tools were a
little uncomfortable at the start of the new course. He went on to explain that he still has uncertainty about what each of the surgical tools is for and it remains an area of discomfort in teaching the course. He continues to state, however, that his goal is not to remain in uncertainty but to eventually learn how to use them properly. Galen referred several times to his “list” of things to learn which in addition to learning how to use the surgical instruments, included being able to emphasize more social and ethical factors in the cases, as well as learning more about laparoscopic surgery.

In general, compared to the first semester the integrated anatomy course was implemented, Galen expressed feeling “a lot more comfortable” in terms of using clinical language and teaching in the context of cases. He noted how his time for learning and preparation has drastically decreased from spending three or four hours to get ready to teach a lab or seminar, to only ten minutes. Yet, he also described a baseline feeling of uncertainty in terms of the “new normal” of teaching in the integrated course. As quoted at the beginning of Part IV he said, “You just feel a little bit uncertain. I mean, as if you’re, you know, as if I’m not really qualified to say it, but I’m just saying it anyway.” In asking how he is able to live in a space of continually being unsure he replied,

Well, you know, you just-- being slightly insecure is just a part of life, you know, you just-- you know it’s what-- that’s part of what keeps you on your toes is the fact that-- not the fear but the realization you’re likely to say something wrong, it keeps you humble.

Paul

Similar to Galen, hearing Paul talk about his teaching in the integrated course compared to his mindset and strategies in the old course showed a significant transition. In terms of now being continually immersed in the language and context of medicine he said, “it’s just become second nature. It’s what I do.” Paul appears to have come to terms with much of what he had to let go in terms of
anatomical detail, and cares more about and exudes more effort in tailoring his teaching to the needs of students. Although he did not mention a feeling of continued uncertainty like Galen, Paul did express that a continual challenge in his reality of teaching in the integrated course is trying to get students to “buy in” to the methods of the integrated course.

As mentioned previously, Paul described how his teaching before the integrated course was very factual; he said, “You couldn’t have discussions unless you had facts”. Paul explained how the transition to the integrated course moved his teaching away from factual content towards being more “conceptual”. He noted that by “conceptual” he means emphasizing bigger ideas and frameworks for thinking about anatomy rather than the smaller details of anatomical nomenclature. Paul said that in his teaching now “you don’t need to know any facts. You’ve got your fancy i this and i that and Google a question and-- there’s no problem finding facts. Facts are easy. But no one knows necessarily how to work with facts.” Paul reflected on his previous mindset of needing to cover everything and how the transition to the integrated course has helped him come to terms with letting this go. He said,

Previously when I was teaching things like, oh, this is very important and then learn later, well, no one cares. Or the idea that if we don’t teach it now it may be important in 20 years-- just ‘cause we don’t think it’s important now, but the realization that 20 years they’ll never remember that you taught it. They’ll relearn it then.

He went on to add that he is more reassured in letting go when there are clinicians informing what content is relevant. He said,

I feel much more comfortable doing it knowing that the material I’m teaching has been validated by people that actually use it. So I’m no longer guessing what’s necessary. I can say, this is what we need to teach ‘cause they said so.
The basic scientists were not the only ones dealing with having to let go of anatomical detail. Paul described how the lack of detail in the integrated course has created an ongoing tension with students. He said,

*The problem is, when you narrow the universe like that, now they [students] get nervous. You know the textbook says something else. My colleague at another school is learning something else. And how’s this going to play out on a board exam anyway? Which is the bottom line, unspoken question.*

Paul explained how his strategy for dealing with this tension has been to “*just stick to it and it gets reinforced in their ongoing clinical experiences.*”

In addition to moving away from facts towards a more conceptual approach to teaching anatomy, Paul said his teaching now is more a reflection of how a research lab functions. He described how he models his teaching from the way he learned as a graduate student, and how he teaches the graduate students he is currently supervising in his research lab. Paul said he made the realization that “*medical students are graduate students. There are just more of them.*” He explained how when teaching graduate students he is “*not a teacher in the sense of listen to me and write it down and go forth*, but that he is “*a coach and a tiller of fields*” in that his emphasis is preparing the soil - helping students develop the skills to learn and solve problems so they can grow and continue to learn on their own. In this conception of teaching Paul explained how he now perceives learning to be developing “*habits of mind*” - ways to analyze data, solve problems, and utilize different learning resources. This new mindset of teaching is reflected in how, similar to Galen, Paul seems more concerned with being in tune with where students are at in terms of their knowledge. Beyond his regular Socratic approach of continually asking students questions, Paul explained how a new aspect of his teaching in the new course is working to meet the needs of each individual student. He said,

*Most of my effort beforehand was focused on how can I explain this the clearest way. It was very intellectual thing. And it really wasn’t doing-- the*
fact that this connects well with this student but not so well with that student. And so how do you tailor individual things.

Where Galen spoke of the ongoing uncertainty with respect to teaching the clinical aspects of the course, Paul explained how a continued tension for him is getting students to “buy in” to a new way of learning. He noted that although students are more motivated and engaged with the clinical content of the integrated course, getting them to leave their old ways of learning continues to be a struggle. He said, “You got to break that 16 years of sitting in the classroom while, you know, the great wisdom-- people give their wisdom.” Paul went on to say how he believes students’ enculturation in previous years of schooling contributes to this challenge. He noted,

At least for medical school, you’re selecting a group of people that have had a certain mindset that got them grades, that got them the board scores, that got them this and that. So we selected for one kind of learning, and now we’re asking people to learn a different kind of learning. So that’s a big-- a transition.

Paul described how year after year as he meets a new class of first year medical students in the integrated anatomy course, he finds himself facing the challenge of having to “re-train” students how to learn. He explained how this means that part of his reality of teaching in the integrated course is that he is not necessarily “liked” by all the students. He noted how this was reflected in written feedback from students.

So I would go to one table and I would read an end of year evaluation of— “Dr. Chiron” [Paul] was great, he’s Socratic, he challenges us, he pushes us, we learned so much from his guidance. And then the next table writes, Dr. Chiron is so intimidating, he comes and he questions us mercilessly. He puts us on the spot. I hate it when he comes by. And, you know, so my perception is I’m the same going anywhere but the students are reacting very differently.
Paul noted that the way he deals with this tension of challenging students to learn in a different way is by being very open and honest about his intentions and the way he teaches. He mentioned how he often says to students, “look, this is what I do. And unless you tell me otherwise, I’ll think I’m doing a good job. So let’s be collaborative.”

Jane

One of the major factors separating Jane from Galen and Paul was that she had only spent months teaching in the new course compared to Galen and Paul’s nearly eight years. At the time of data collection for this study Jane had been teaching in the integrated anatomy course for just over two months. Despite this short period of time, Jane seemed to believe that letting go of details was a good idea. She said, “I want to train them to be good doctors, but that doesn’t mean they need to memorize, as Paul says, every origin and insertion of every muscle. Because not all doctors need to know that.” At the same time, Jane described how there were still some areas where she believed learning details was still important. For example, she said, “When we get to the limbs, because when I have been teaching or learning in the past it has been much more detailed in terms of muscles and insertions and all of that. I want to remember all of that--even though Paul doesn’t think it’s important because I think some questions are going to come up.” Jane also expressed her continued belief that in order for students to learn something it needs to “officially” be presented or explained to students. For example, in studying the layers of the abdominal wall Jane expressed some uncertainty in students’ abilities to be able to learn the material on their own. She said,

So I see how cases are driving the labs. But I’m not yet convinced that that’s the best route to take. Like, okay, nobody told them about how the gonads descend. And in lab they’re supposed to be finding the layers of the testicle and tracing it back to their abdominal layers. And were they just supposed to figure that out? I don’t know. But that information was
never presented to them in a formal way. And so I put it into my pre-lab talk because I thought it was completely 100 percent essential, but I think the way that the case was presented did not-- illustrate the embryology that is essential to understanding why the anatomy looks the way it does … I still see some holes and maybe because as Paul is so fond of saying, well, they’re Lillian Douglas students. They’ll figure it out. Maybe that’s true.

Beyond the aspects of letting go of anatomical detail and feeling the need to formally cover content, another facet of teaching that Jane spoke to was with respect to moving towards teaching Socratically versus her previous approach of identifying structures for students in a more didactic way. Jane explained how in transitioning to the integrated course most of her learning in terms of teaching strategies came from spending one on one time with Paul; walking through the material and hearing him talk about how he approaches labs, seminars, and lectures. As mentioned previously, the philosophy or “archetype” of the integrated course in terms of teaching is that students are expected to seek out resources for themselves and the role of teachers is to help guide their learning rather than give them answers. Participants referred to this teaching “standard” of the course as a “Socratic” approach. For the most part Jane expressed her desire to embody this standard in her teaching practice. Reflecting on Paul’s pedagogical approach she said,

*He’s very Socratic in his teaching. When I watch him do it, he is masterful at it, I want to be able to emulate that and model it, but I just don’t have that sort of experience … But I would rather be moving more towards that direction than what I’m at which is just sort of like somebody asks a question, and in three milliseconds I have to decide do I know that or do I not. And if I know it, I just say it. And if I don’t I say, let’s go find somebody to answer.*
Yet, at the same time Jane mentioned how she is still somewhat hesitant about fully "buying in" to the pedagogical ideal of Socratic teaching set in the course. She explained,

*Since I've also seen that you can be an effective teacher without that, I'm sort of two minds. Like, why at this point, like, spend so much effort when it's easier for me to teach this way which is just sort of didactic and-- they ask a question, I answer it. But I can see the appeal. And I would like to work to be that way, but I'm trying not to beat myself up about it that I'm not there yet.*

Jane's movement between her “two minds” of teaching is reflected in how although she acknowledged that "effective" teaching can occur *without* using Socratic teaching strategies, in thinking back to her days as a T.A. pointing out structures on a cadaver she commented on being uncertain if that was “*effective for the students.*”

In addition to talking about her negotiation between the Socratic standard of the course and her previous teaching strategies, Jane also discussed how in the new course she was completely comfortable asking for help most of the time but other times felt somewhat embarrassed for not knowing an answer. This seemed to be connected with the nature of what information she was being asked about. As described in the previous section on “humility”, Jane expressed how she was totally fine with seeking the help of a physician when questions were of a clinical nature. However, when questions were in the realm of anatomical information, something she felt she should know, she described how not being able to provide an answer caused her some anxiety. For example, one day in lab Jane was unable to immediately identify the kidney as it was embedded in an abnormal amount of fat. After calling Galen over for help she explained how it was embarrassing to not be able to simply identify it. Jane related this fear of not knowing something to the early stage of her career. She explained,

*I feel like the expectations are a little higher for me … So I think, you know, you look at me, you look at Galen, the students just expect different*
things and I think the pressure feels higher on me. I want them to respect me and I worry that every tiny little misstep that I make or I say something wrong and all of a sudden they’re just going to be, like, pffft, we’re never listening to her because she doesn’t know what she’s talking about.

Despite the differences of being new to the course and early in her career, Jane and Galen seemed to draw one parallel with respect to teaching in the new course. She explained, “I haven’t yet had a seminar or even a lab where I feel like every question that somebody comes up with I either thought of and looked up or, you know, could-- just knew already.” She added, “I always feel like I could be more prepared.” This state of never being able to know everything appeared similar to Galen’s description of living in a state of uncertainty in the clinical course.

I will now move beyond the participants’ individual experiences of teaching in the integrated course to looking more closely at what it is like to “live” in the clinical world. First, in terms of the nature of the clinical knowledge they have learned, and second, in terms of a tension that appears to be rising as the course progresses.

Frame and scope of clinical knowledge

There is no definitive line that can be drawn between anatomical knowledge and clinical knowledge, as anatomy provides much of the foundation of medical language and understanding. As noted by Galen, “We all [anatomists and clinicians] respect each other’s knowledge base, realizing that both knowledge bases are large and partially overlapping.” In order to further understand Galen, Paul, and Jane’s new reality after the transition, this section will look at how the clinical knowledge they learned appears to be framed, and stemming from that framework, the scope of their clinical knowledge. By “scope” of knowledge I mean what kind and how much clinical content or expertise did these basic
scientists have to learn in order to teach in the integrated course? Where Part II of this chapter looked at the process and experience of learning clinical material, this section looks at the extent of knowledge they came to acquire and how they organize it for the purpose of teaching in the integrated course.

What the participants have come to learn in terms of clinical content appears to be largely framed within the cases of the course. Galen and Paul, who have now been teaching in the integrated course for nearly eight years, seem to know these cases especially well. In attending their pre-lab talks and faculty meetings I observed how they both speak quite fluently about the patients in each case, their histories, diagnostic studies, and the operative approach taken. So much that if I had not known their professional backgrounds I would have assumed they were physicians. As noted by Jane, “they’ve now had several years with the clinical stuff and I think they’ve picked up a lot of it.” As an example of how their clinical knowledge is largely bound by the cases, Paul shared a story of how a case was once presented amidst his clinical colleagues. They asked what he thought the diagnosis was and he explained, “I got it right. And they said, ‘well, that’s really good. How did you come to that?’ And I said, ‘well, I didn’t know it could be anything else. I only had one option.’” Paul mentioned how the cases that the course is based on, although authentic and very detailed in the clinical content they contain, do not emphasize trying to come up with differential diagnoses. He went on to say how students at Lillian Douglas have separate courses that focus on the specifics of clinical reasoning. As such, in developing the integrated course Paul noted how they were not trying to fill that void in any way. Their aim was to design cases that highlight anatomical concepts and relationships in the context of clinical cases, and as such this is how their clinical knowledge and expertise appears to be framed. Paul explained, the clinicians know all the stuff that I don’t know. And never intend to learn, frankly … So the clinicians would say, oh, you know, these-- the differential diagnosis here is much broader than you’re making out how to be. And, you know, you have to consider so many things besides neuropathy. I
said, but read the question. Read the problem. The problem said begins as soon as this is a neuropathy.

Having their clinical knowledge framed, for the most part, by the cases of the course seems to leave the information standing alone rather than being related to a bigger clinical picture. In contrast to the surgeons who can locate a case within the many examples they have seen over their lifetime, Galen, Paul and Jane have not had years of seeing patients in the clinic and therefore have less of a sense of the variation in the types of cases there are. Jane in particular spoke about how her clinical knowledge feels somewhat disconnected. She explained,

I don’t have any peripheral information, right. And so [the surgeons], have so much, you know, they’ve seen these cases and they know how it fits with-- I don’t know. We don’t have the vast amount of knowledge about how these cases, you know, the background of the cases and the variation.

She went on to describe how for her the cases are somewhat like “floating” solitary examples.

So my dad talks about his theory about how people learn is that you basically have, in your head, what is akin to, like, a tinker toy model. And when you’re presented new information you have to figure out how to attach it to your existing tinker toy model otherwise it falls on the ground and you forget it … And I keep getting handed these cases for which I have very few connectors.

A strategy to try and “connect” the cases that was mentioned by both Galen and Jane was to try and learn about the prevalence of each case. Galen explained,

I’ve had to spend a lot of time on clinical websites and, you know, looking for images and trying to determine whether a question is really-- very often it’s helpful to know … how common was it for the -- [condition] to occur … So we have to say, you know this is very common. You’ll see this. Or this is really-- it could happen, but this is really more theoretical than real. So having to dig in a little bit of background, you know, sometimes is a struggle.
Jane expressed a similar search for prevalence. She said, "I do end up reading a lot of abstracts on PubMed ‘cause … I was really interested in, well, how frequent is this?"

Jane spoke to how her clinical knowledge was also limited in terms of the surgical tools in the lab. Having only taught in the course for two months it was not surprising when she stated, "having all of these tools I don't even know what the point of most of them are. I don't know their names." As previously mentioned Galen, in his eighth iteration of the course admitted that he still does not know how to properly use the surgical tools. However, he also noted that although he would like to learn how to use them properly it is not a problem that he does not know the specific use of each tool given the presence of surgeons in the lab.

Despite the extra work Galen and Jane described putting in to try and learn about the variation and prevalence of cases in order to try and fill in the gaps of their somewhat "disconnected" knowledge, the participants also spoke to how their knowledge being to some extent narrowed by the cases of the course was in some ways an advantage. For example having somewhat limited clinical knowledge can be an advantage in that it is appropriate for the level of the first year medical students they are teaching. Jane explained,

because we know the anatomy well enough our little bit-- our tiny little understanding of the clinic stuff is enough for these students. I don't think it would be enough if we were dealing with first-year residents. Obviously not with other levels of education. But the first-year students it's good enough.

Paul spoke to how another advantage of having a narrower frame of clinical knowledge was as teaching strategy to keep students on task. He said,

Students will ask [clinicians] questions off topic because it's of interest to them and how do you keep focused on the task. I can say, well, I don't want to go into that. I'm not a clinician. I don't want to mislead you; let's focus on what I can tell you.
Rising tension

This last section of exploring the new “country” that Galen, Paul and Jane are living in after making the transition to the integrated curriculum explores a tension that may have been growing with each iteration of the course, but now seems more apparent after Jane’s arrival and her unique perspective as a “fresh” set of eyes.

Galen and Paul described how since the integrated course was developed and implemented it has largely stayed the same. Galen said, “we’ve added a few minor additions to procedures, but the major cases have remained the same.” Paul mentioned how they have plans to improve procedures for dissecting the eye, but apart from that do not anticipate any major upcoming changes to the course. A more recent factor contributing to the lack of change in the course is that over the past couple years the medical school at Lillian Douglas has begun engaging in planning a school wide curriculum reform. Paul noted, “the course is going smooth, how is it going to integrate with the curriculum overhaul that’s coming up? So I really have no interest in doing any kind of futzing until we see how that’s going to play out.”

In being new to the course Jane held a unique vantage point in that she in some ways represented an outsider’s perspective compared to those who have been immersed in the course since its conception. From her position she observed that the framing of anatomy in clinical cases might be causing somewhat of a tension between keeping the cases as they are versus changing them to stay relevant to the ever-changing context of medical practice. In general, Jane spoke about her concern that some of the cases are starting to become out of date. She expressed how the core anatomy teaching faculty who are also surgeons indicated that some of the procedures are no longer utilized. Despite having given this input she explained how she feels that those in charge of the course
did not appear to be taking steps to adjust the cases to stay clinically relevant. Jane said,

They did a huge amount of work five to seven years ago to get this to be a new course and transition through it. But it’s now sort of been stagnant. They haven’t been rethinking: did this work, did we serve our students well, are we presenting them with the most up-to-date clinical stuff. It’s almost as if—anatomy is one of those courses where if you teach it six times then maybe you never have to think about it again. Because you’re on autopilot because anatomy doesn’t change. And it was a huge thing for these guys [Galen and Paul] to overhaul their course because all of a sudden they had to learn all kinds of new stuff. But now they’re sort of back in that mode where none of this ever changes because it’s anatomy.

But the clinical stuff does change.

Jane went on to say how this tension is usually manifested during the anatomy faculty meetings. She explained how at a recent meeting,

[one of the surgeons] said, ‘So we don’t do-- I’ve never done a vagotomy.’
And Paul said, ‘Well, but they still do it in the E.R., right, for emergencies.’
And [the surgeon] just said, ‘No, no, they don’t. It’s just not done. And Paul said, ‘Well, it’s still a good way to teach them about the anatomy.’ And that was the end of the discussion. And then last week-- for the celiac nerve block. And [another surgeon] just said, you know, he’s maybe seen it 30 or 40 times and it worked zero of those times. And so he just says it’s too imprecise. And I think Paul is perfectly okay with us, then, mentioning that to the students. But I didn’t see him decide maybe we should think about how we present the cases in a different way … So I think it could definitely-- I think the course is well designed and the students are getting both anatomy and clinical stuff out of it. But if the clinical stuff were slightly more up to date, you know, it could use some tweaking. I feel like Paul did a great job but in some cases it just-- it’s almost old-fashioned or irrelevant now. It’s not cutting edge clinical stuff anymore.
This tension between keeping the cases as they are versus changing them to be more relevant appeared to be a salient aspect of Jane’s reality in the integrated course as she spoke about how she feels conflicted learning and teaching material that may not be well correlated to the medical profession. She explained,

*I learn what Paul wants all the students to learn and so I think, okay, vagotomy, got it. I understand it. And then [one of the surgeons] comes in and says, ‘but we never would ever use it.’ And so I just-- part of me actually is a little bit suspect about the quality of the clinical stuff we’re teaching them.*

Paul on the other hand does not appear to experience this same tension as Jane. Alternatively, he described how he still perceives the cases and surgical procedures to be useful tools for teaching anatomy. Mentioning the same cases Jane brought up as being questionably outdated, Paul explained,

*There are some cases like acid secretion in the stomach that we talk about procedures that used to be done but now we have therapeutic pharmaceutical interventions that are more the frontline thing. And I would just say to the students, you know, we don’t do this anymore, but let’s review some of these classic procedures to understand a little bit about how the G.I. system works. We’re using the surgical procedure as a vehicle. We don’t care if it’s not done this way. We can’t teach it the way it’s done because the way it’s done involves the tiniest incisions. And seeing things on a camera.*

Galen expressed a similar perspective to Paul with respect to the utility of the cases. He noted,

*occasionally you hear complaints of the surgeons who come in and say, well, you know, we don’t do whipples anymore. Well, in fact, it turns out actually they do whipples. They just don’t do them as often. So I think-- at least for the moment I think we’re okay because in some cases we had to pick surgeries that weren’t necessarily common, because that’s the only*
way to show the anatomy … What we will say in a procedure is we’ll say, ‘Well, we don’t do this anymore, but it used to be done. And the reason we’re continuing to do it is because it’s very useful for elucidating the anatomy.’ I mean, for instance, you know, everybody has laparoscopic surgery now. So I think we try to make it clear that it may not be a common surgery, but it’s anatomically important.

Summary

This chapter used the metaphor of moving to a different country to describe what it was like for participants to transition to teaching in an integrated curriculum. Part I, “Before the move” outlined the background of each participant’s academic career as well as described how after a mandate from the dean for the anatomy course to be under 100 hours, Galen and Paul took the reins in terms of collaborating with clinicians and developing the integrated anatomy course that would be framed with clinical cases. Part II, “Leaving home”, described how before the transition participants’ previous teaching “home” was one where they were largely popular and successful. The focus of teaching was on the detail of anatomical facts and ensuring that information was delivered in its entirety to students. Despite “home” being fairly good, the motivation to leave appeared to be a combination of being in the context of university that values research and innovation, a feeling of discomfort in terms of cutting content that may be critical to medical students future careers, as well as an intrinsic desire to teach anatomy more effectively. For Paul in particular, leaving “home” involved a shift in perspective from seeing the demand for 100 hours as impossible to it being an opportunity to make some meaningful changes in the course. Leaving the “home” of the old course involved letting go of several aspects of their former teaching including being the sole informants of what content was included, certain anatomical areas they specialized in, their mindset of feeling they had to “cover” all of the content, and parts of their anatomical language. Part III, “Arrival and enculturation” described how the transition to the integrated course involved a
process of learning; learning with respect to the clinical aspects of the course as well as learning a new “Socratic” teaching strategy. Learning the former involved the work of self-study, collaborating with clinicians, and having an attitude of humility, which meant being honest about their limit of clinical knowledge and being willing to seek the help of physicians. Learning a different teaching strategy similarly involved collaboration but in this case with a pedagogical expert who facilitated faculty development for the core anatomy teaching faculty throughout the implementation of the course, as well as the educators Paul interacted with during his time at the Harvard Macy Institute. Part IV, “Life in the new ‘country’”, described the participants teaching in the integrated course which was largely focused on students, what they needed to know and where they were at in terms of their knowledge, instead of trying to deliver a certain amount of information. Where every participant seemed to make significant changes in terms of their teaching each commented on different challenges in the new “country” of the integrated course. Galen described his uncertainty in terms of his sense of credibility in teaching clinical content, Paul mentioned his challenge of getting students to “buy in” to a new way of learning, and Jane explained her continued negotiation between wanting to let go of anatomical detail yet still feeling the need to formally cover a certain amount of material. Part IV also described how the participants’ clinical knowledge is largely framed by the cases of the course. This seemed to be an advantage in that it was appropriate for the level of detail needed in teaching first year medical students and could be used as a strategy to keep students on task, but having their clinical knowledge largely bound by cases left participants feeling like their clinical knowledge was somewhat like “floating” disconnected examples. Lastly, the chapter ended by considering a tension that appears to be rising in the integrated course in terms of whether cases should remain as they were originally developed over eight years ago because they still illustrate anatomical concepts, or whether they should be modified to stay relevant to the changing context of medicine.
Chapter 5 – DISCUSSION

Overview

In line with a phenomenological approach, the previous chapter was a rendering of what it was like to transition to an integrated curriculum as told through the experiences of three basic scientists. Although some interpretation was inevitable in compiling and organizing their stories, I used their voices as much as possible. In this chapter I will look beyond the individual experiences of the participants in order to better understand the phenomenon of transitioning to an integrated curriculum. Specifically I will discuss four explanatory concepts that will not only characterize the experience of basic scientists transitioning to an integrated curriculum, but will also point to how each participant may have experienced the change differently. As described more fully in the Methods (Chapter 3), these concepts were distilled from the findings of this study (Chapter 4) through a process of circling between the “parts” of participants’ experiences of integration and broader concepts that characterized the transition more generally. The four explanatory concepts include: 1) a shift from teacher-centered to student-centered teaching; 2) embracing a “beginner’s mind”; 3) the maintenance of control; and 4) a transformation of identity (Figure 5.1). The chapter will close with a General Model of Teaching (Pratt, 1998) which will be used as a conceptual framework to bring together the explanatory concepts discussed throughout the chapter.

A shift from teacher-centered to student-centered teaching

The first explanatory concept characterizing the experience of basic scientists transitioning to an integrated curriculum is a shift in teaching from a teacher-centered to a student-centered approach. In this section, I will first define a “teacher-centered” approach and describe how participants’ teaching before the transition appeared to embody this perspective. I will then move on to describe
Figure 5.1 – Explanatory concepts. Four explanatory concepts characterize the experience of basic scientists transitioning to an integrated curriculum. These include: a shift from teacher-centered to student-centered teaching, embracing a “beginner’s mind”, the maintenance of control, and a transformation of identity.

“student-centered” teaching and how the change to clinical cases, as well as the transition to using new teaching strategies in the integrated course, reflected an emphasis on student-centered teaching. Collaboration will then be considered as an enabler of change in teaching. I will close the section by using Jack Mezirow’s concept of transformative learning (2000) as a tool to help explain the extent or spectrum of change in participants’ teaching.

Teacher-centered teaching

The participants’ teaching prior to transitioning to the integrated curriculum appeared to be “teacher-centered”. By “teacher-centered” I mean that as teachers they understood themselves to be the source of anatomical content. For example, before the transition Galen said, “I saw myself as a font of knowledge.” Participants’ pedagogical approach before the transition was also teacher-centered in that they felt their roles as educators was to pass on all of their knowledge to students. As noted by Paul in talking about his prior teaching, “if I don’t say it in my lecture, they’ll never learn it ‘cause where are they going to hear it after all? And if I said it, I accomplished my goal”. Galen similarly described how before the transition to the integrated curriculum he thought his
“job was to tell people everything”, and, “we have so little time-- if I don’t tell them, they’ll never learn it.” Although Jane’s teaching before transitioning to the integrated course was framed by the professor she was a teaching assistant for, this largely paralleled Galen and Paul’s teacher-centered approach in that her role was to tell students all of the structures that were covered in lecture.

Within this teacher-centered approach there appeared to be less emphasis on students. Specifically raised by Paul, he explained how before the transition it was
easy to give a lecture and then you’re done. You don’t need to know what the students know or don’t know. They laughed at your jokes. They asked one or two intelligent questions. You feel you did a good job, and you’re done.

Lack of emphasis on students was also exemplified when in talking about his teaching before the transition Paul said, “I didn’t really care much about ‘learning theory’ or that different students learn different things. It was just kind of assumed and, you know, here’s the material, learn it however you are.”

In sum, the participants teaching before their transition to the integrated curriculum seemed to be largely centered on their own anatomical knowledge and their ability to effectively deliver that knowledge to students. Students for the most part were perceived as recipients of knowledge. Knowing where they were at in terms of their knowledge or current level of understanding did not appear to be an integral part of their teaching.

**Student-centered teaching**

Each basic scientist’s transition to the integrated course seemed to include a shift in teaching from being teacher-centered to student-centered. What I mean by “student-centered” is exemplified by the two facets of change in the course. First, the change towards clinical content and cases was focused on what students
need to know, and second, the change in teaching strategies were aimed to develop students’ skills to solve problems and find resources on their own. Both aspects of change required the basic scientists to collaborate with professionals outside the context of their teaching. In this section I will interpret both aspects of change (clinical content and teaching strategies) highlighting how each transition involved keeping students at the center.

Change in course content

In transitioning to the integrated course Galen and Paul explained that they were concerned about how their choices in cutting content solely from their basic science perspective might be a detriment to students’ futures as physicians. As noted by Galen the question of “what do [students] really need to know?” became the driving factor for what content would be included in the course. Paul explained how the “vision was, you know, let’s get clinical cases. They should be common clinical cases, anatomy-rich cases. So that when students go on the floors, in whatever venue, they’re going to see cases like this.”

Teaching what students needed to know required Galen, Paul and Jane to broaden their clinical knowledge. As framed in Figure 4.1, collaboration with clinicians, attitudes of humility as well as the work of self study were three factors contributing to the participants learning the clinical aspects of the integrated course. In the old course their knowledge was largely anatomical details. For example, Paul noted “anatomical content, that was the overriding thing … it was all about how do we learn a lot of details? What are the important details to learn?” The knowledge required to teach in the integrated course, however, included patient histories, diagnostic tests, surgical procedures, and interpreting radiological images. Participants’ initial transition to the new curriculum - during the development stages of the course for Galen and Paul, and years later for Jane when she first came to Lillian Douglas - involved a period of intense learning. As described in Chapter 4 (Findings), this entailed asking clinicians
questions, listening to how they talk, observing how they use the surgical instruments, and studying surgical textbooks and radiology websites.

Change in teaching strategies

Teaching in the integrated course was student-centered not only in terms of changing the content from anatomical facts to clinical cases, but also in terms of teaching strategies – how the participants engaged students with content. This shift seemed to primarily stem from a transformation in Paul following his exposure to a different pedagogical approach at Harvard Macy, as well as from the guidance and educational expertise of Kyle the faculty development facilitator.

As previously discussed, in terms of content, the shift towards a student-centered approach was exemplified by Galen and Paul asking the question of what do students need to know? In terms of teaching strategies, the foregrounding of students was demonstrated by them considering the questions of where are students at in terms of their knowledge and expertise, and what skills will they need in the future? Galen spoke to the former question when he discussed how the most important thing about teaching, even more than knowing your subject, is “to know what the student knows, and to figure that out at some point”. Paul exemplified this shift towards meeting students’ individual needs when he explained,

most of my effort before hand was focused on how can I explain this the clearest way. It was very intellectual thing. And I really wasn’t doing-- the fact that this connects well with this student but not so well with that student. And so how do you tailor individual things.

The transition from a teacher-centered to a student-centered approach in the integrated course involved a shift from trying to deliver a certain amount of content, to wanting to help students develop the thinking and problem solving
skills they would need to engage with the content themselves. In other words they became more concerned with developing students’ abilities to think through clinical problems than passing on their own anatomical knowledge. As stated by Paul, “you don’t need to know any facts. You’ve got your fancy ‘i-this’ this and ‘i-that’ and Google a question and-- there’s no problem finding facts. Facts are easy. But no one knows necessarily how to work with facts”. Galen noted, “the idea is to get them to start thinking about things systematically, to-- not memorize things.” This shift towards wanting to nurture the skills students would need as future physicians appeared to be manifested as a change in teaching strategies. They moved from a didactic style of telling students answers, to what they called a “Socratic” method of teaching where the focus is on asking students questions in order to guide their learning. In terms of teaching strategies they also made a shift from providing students with all the resources and information they would need to pass exams to, in Galen’s words, “throw[ing] them in the water and mak[ing] them swim”. The vision was to leave it to students to determine what information they needed and to locate resources on their own. As opposed to being “fonts of knowledge” pouring out information, they moved towards being, in Paul’s words, “tillers of fields”, nurturing the soil so students can grow on their own.

Collaboration: An enabler of change in teaching

In both learning the clinical content and learning new teaching strategies, Galen, Paul and Jane were learning from individuals who had expertise beyond their context of anatomy education. In terms of learning the clinical aspects of the new course each participant spoke of how the opportunity to collaborate with clinicians helped them learn the clinical content. They explained how being able to ask clinicians questions, and “eavesdropping” on them in the lab was hugely beneficial in helping them pick up clinical language and terminology. In terms of new teaching strategies Galen and Paul learned much through their collaboration with Kyle, the pedagogical expert. During the implementation of the course they
discussed their teaching with Kyle on a weekly basis. Kyle provided a context where how they were teaching the new clinical content was in the spotlight and repeatedly shared and analyzed in a group with the core anatomy teaching faculty. Coming to the course later Jane described how she gained a great deal of insight in terms of teaching through her conversations and observation of Paul. Similar to eavesdropping on clinicians in the lab, she noted how hearing Paul talk about how he approaches his teaching was key in helping her learn a new teaching approach.

Spectrum of change in teaching

“All educational innovation comes down to how well it’s practiced by the teacher. It really does.” -Kyle

To this point I have been talking about what appeared to be the teaching “standard” of the integrated course. As previously described the standard is a student-centered approach where content is framed in clinical cases and instructors use teaching strategies that help develop students’ problem solving skills rather than just delivering anatomical content. Every participant took steps toward embodying this standard of teaching into their practice, yet changes in Galen, Paul, and Jane’s teaching seemed to fall along a “spectrum” of change with each of them having taken up the student-centered approach to varying degrees. This section will look at both the nature and temporal aspects of change in Galen, Paul and Jane’s teaching as well as the extent to which they each took on the teaching standard of the integrated course. Specifically, this section will look at the change in participants teaching strategies, rather than their adoption of the clinical aspects of the course. This is because there seemed to be a difference in the extent to which the two facets of change in the anatomy course (clinical cases and teaching strategies), were taken up and utilized by the participants. In general, it seemed that in terms of the clinical aspects of the course, all of the participants willingly and earnestly worked hard to learn the
clinical content and teach through the framework of cases. In terms of teaching strategies, however, there seemed to be more variation in the degree to which each participant held to the “standard” of teaching in the course. This “spectrum of change” appeared to range from the participant “fully” taking up the new teaching strategies exemplified by always using what participants described as a “Socratic” approach, to a lesser adoption of the teaching standard demonstrated by reverting back to telling students answers versus asking questions to help guide their learning.

A factor that seemed to play a role in the degree to which the participants took up the new “standard” of teaching was the degree to which their orientation as teachers changed. By teacher “orientation” I mean the beliefs participants hold about learning and the role of a teacher, as well as their intentions, or what they are trying to accomplish in relation to their beliefs about teaching and learning. For example, the participants’ teaching before the transition appeared to be based on a teacher-centered approach, which is often characterized by teachers focusing more on what is taught than on what is learned (Pinney et al., 2007). This approach is undergirded by the orientation that in order for students to learn the teacher has to effectively deliver a certain amount of content. The extent to which participants continued to hold on to this belief rather than changing their perspective to the student-centered approach of the integrated course seemed to impact the degree of change in teaching strategies.

Paul explained how his change in teaching occurred prior to the implementation of the course. During his time at Harvard Macy Paul appeared to be enlightened by what he learnt in terms of a new approach to teaching. He noted how at Harvard Macy he learnt the pedagogical language to describe his discontent with the “effectiveness” of the previous course – that students could answer questions on exams, but later could not remember a thing.
Although all the participants made steps towards a more student-centered approach to teaching, in terms of fully adopting the standard of the new course, Paul seemed to be the only one. Compared to the other faculty, Kyle noted how Paul became a “true believer.” As Paul was the only one to attend Harvard Macy it is not surprising that his transformation in terms of teaching was so profound compared to the other anatomy faculty. The extent of change in Paul’s teaching orientation was further exemplified by Kyle when he noted how he was “a pure researcher and had a transformation … [he] had become convinced of something”. He also mentioned that Paul often explains how he went to Harvard Macy and “got religion”.

Galen’s transition in terms of teaching orientation seemed to occur during the period of faculty development sessions with Kyle. Kyle described how Galen had what seemed to be a similar realization to Paul in terms of the lack of effectiveness of the previous course. He recalled, “[Galen] got curious at one point and decided after giving a particularly glorious lecture, to actually quiz students the next week. And he was shocked to find out that they didn’t know anything about what he was talking about.” Where Paul’s experience of adopting new teaching orientation appeared to be more of an exciting enlightenment, Galen’s transition to more student-centered teaching appeared to entail some persuasion and the breaking of previous habits. For example, he explained Kyle’s role in “keeping us on topic and really convincing most of us that if we could just give up some of what we held dear, that we’d be more effective”. In addition he spoke about needing to break himself of the fact that students do just fine, you know, given guidance and direction rather than, you know, being a recipient of huge chunks of knowledge … So having to leave a session without as-- giving them a critical bit of knowledge, simply because, you know, it’s too much. Having some confidence that they’ll pick it up on their own.
Galen in many ways moved towards adopting the student-centered approach of the new course. However, unlike Paul, he explained how he often reverts back to his previous teaching strategies of telling students answers rather than guiding them with questions. The extent of change in Galen’s teaching strategies is illustrated by how he described having “good days” where he probes students with questions, versus days where he “still find[s] things in the lab”. He noted how pointing out structures to students rather than letting them struggle to find them on their own is something he has continued to do. Thus, despite the huge strides Galen has made in terms of learning the clinical content, and spending way less time delivering content during his pre-lab talk, he still to some extent holds on to his teaching strategies from the previous course where he provides students with answers rather than letting them discover them on their own.

Having recently transitioned to teaching in the integrated course Jane appeared to be in a state of uncertainty in terms of questioning her orientation as a teacher. As an early career faculty member and new to the clinically framed course, her teaching and mindset about teaching seemed to be developing and growing as she tested out different strategies and observed other faculty teach. Jane’s experience appeared to be one of migration between the only way she had ever learned or taught anatomy – through didactic nomenclature, to the new clinically framed course with an ideal of student-centered teaching. She seemed to be in a state of fluctuation between being able to let go of anatomical detail and feeling the need to cover it, as well as between teaching “Socratically” and reverting to her old way of teaching of just giving students answers. What Jane described as having “two minds” of teaching (Chapter 4, Findings) appeared to be her negotiation of her previous teaching orientation and the standard of the student-centered approach she was confronted with the in the integrated course.

Although she had only taught in the course for two months Jane was well aware of the standard of student-centered teaching in the integrated course. She identified Paul’s Socratic teaching as “masterful”, and described how visiting
surgeons did not exemplify the ideal student-centered approach in their tendency to tell students everything and do the dissection for them. She said,

When I look at the surgeons in lab, they are up to their elbows … they just have to tell the students the way it is and show them. And there’s less patience with letting the students do it themselves and make mistakes and figure it out and play around and look at relationships.

Jane expressed on several occasions her desire to move towards the student-centered teaching standard. She described how she wanted to emulate and model Paul’s example, and explained how she understands that as future doctors, students do not need to know every minute anatomical detail. She noted, “I want to train them to be good doctors, but that doesn’t mean they need to memorize, as Paul says, every origin and insertion of every muscle. Because not all doctors need to know that.” In general, it appeared that similar to Galen and Paul, Jane had come to the realization that she was dissatisfied with her previous teaching orientation. She explained,

I would rather be moving towards that direction than what I’m at which is just sort of like somebody asks a question, and in three milliseconds I have to decide do I know that or do I not. And if I know it, I just say it. And if I don’t I say, let’s go find somebody to answer.

Yet, despite her dissatisfaction with her previous approach to teaching and her aspiration to emulate Paul and adopt a more student-centered approach, Jane was still in a state of fluctuation in terms of embodying the teaching standard of the new course. For example, Jane did not appear to be fully persuaded that students would be able to learn without content being officially covered in class. She said,

So I see how cases are driving labs. But I’m not yet convinced that that’s the best route to take. Like, ok, nobody told them about how the gonads descend. And in lab they’re supposed to be finding the layers of the testicle and tracing it back to their abdominal layers. And were they just
supposed to figure that out? I don’t know. But that information was never presented to them in a formal way.

Jane’s fluctuating state in terms of teaching orientation throughout her transition to the integrated course is best captured in her statement that,

Why at this point, like, spend so much effort when it’s easier for me to teach this way which is just sort of didactic and—they ask a question, I answer it. But I can see the appeal. And I would like to work to be that way.

Similar to Galen, Jane seemed to have somewhat adopted the student-centered approach of the integrated course but appeared to remain in a state of negotiating whether she should work towards Paul’s “masterful” example of Socratic teaching, or do her own thing in terms of teaching strategies. Jane’s awareness of whether or not her teaching aligned with the espoused pedagogical standard of the course seemed acute. Specifically, she expressed feelings of concern when she knew her chosen teaching strategies did not align with the student-centered approach. She explained,

I do a lot of like, I’ll make up a table when I’m studying it. And then I’ll send it to [my group of students] and say, this is what helps me. And the reaction has been overwhelmingly positive. They love it. They want more of it. But I am a little worried that if Paul found out about it he’d think that it was inappropriate, like, that I’m somehow giving them answers and they’re supposed to be the ones coming up with this sort of thing.

At the same time, Jane described how while she felt like she needed to hide her going against the student-centered standard, other faculty members were confident to largely use their own strategies in seminars, labs and lectures. She explained,

[The other faculty are] confident enough that if they disagree with Paul about the importance to place on something or the method to teach, they’re fine with that and they’ll just do their own thing. ‘Cause they know it’ll work. Whereas I feel like because I don’t have my own identity, the fact
that I’m not 100 percent emulating Paul is a detriment to the students, if
that makes sense. Like, if I were more confident in my own teaching style,
I’d be okay with disagreeing with Paul and not doing everything the way
he does. But instead all I’m doing is judging myself against him and
always finding myself lacking.

Even during my relatively short time with the anatomy course at Lillian Douglas I
observed a change in Jane in terms of finding more confidence towards
expressing her own values and beliefs as an educator. This may have come from
her having had more time to observe the other faculty teach, as she described on
several occasions how she noticed they were “comfortable” and “confident” doing
their own thing. My presence and role in observing all of the faculty teach,
especially in seminars, may have also had an impact on Jane’s teaching as prior
to our conversations she had no insight to the fact that each faculty member ran
seminars very differently. During our last conversation she noted,

  I’m certainly now halfway through the semester realizing that … I can do
  my own thing in seminar and that comes just from observing and even
  hearing from you that [the other faculty] will do things a little differently.
  And so that means I still very much appreciate hearing how Paul does
  things but I’m not tied to that.

Thus, Jane’s experience exemplifies how the extent to which someone changes
their teaching orientation may be impacted by how secure or stable an educator
is in terms of his or her identity as a teacher. The confidence of the more
experienced faculty seemed to make them more comfortable and willing to do
their own thing as opposed to adopting the new standard of student-centered
teaching. At the time of the study Jane, an early career faculty member,
appeared to still be negotiating her teaching identity. With no firm sense of her
teacher self to stand on she felt pressure to conform to the standard teaching
approach of the course. However the confidence she gained in only a matter of
weeks indicates that it may not take very long to establish one’s own teaching
approach, whether or not they conform to the standard of the course.
Transformative learning

Mezirow’s concept of “transformative learning” (2000) helps explain the variability of change in teaching orientation among the participants. Mezirow describes transformative learning as “perspective transformation” where there is a change in our frame of reference or the assumptions through which we interpret our experiences (1997). Transformative learning is grounded on the understanding that everyone has their own unique vantage point from which they interpret the world. It is as if each of us has our own stained glass window through which we view everything around us. Each pane of glass that makes up our window is from every piece of knowledge we have learnt, and experiences that we have had. Transformative learning involves someone purposefully looking at and reflecting on what panes their window is made of, and how they are configured. This critical reflection may lead them to remove a certain pane or ideal, add new ones, or rearrange how the existing panes are organized. The result of this rearrangement is a new window, or perspective, through which, in our case, an educator now sees his or her teaching. As Cranton and King (2003) refer to Cranton’s earlier work (1996), “when educators are led to examine their practice critically and thereby acquire alternative ways of understanding what they do, transformative learning about teaching takes place.” (p.32) However, educators’ orientations as teachers are extremely durable making this transformation of perspective somewhat of a rare occurrence (J. Mezirow, 1997). Given the infrequency of such critical reflection and change, it is not surprising that Paul was, in Kyle’s words, “a one true believer”. He had a dedicated period of time at Harvard Macy to critically reflect. Even on his return to Lillian Douglas he mentioned how he continued his reading of the education literature. Compared to Paul, Galen and Jane had less opportunity to critically consider their teaching orientation. Galen did engage in the faculty development sessions with Kyle, but it appears that these sessions may have focused more on teaching skills and strategies rather than an uprooting and reflecting on teaching orientation. As described in Chapter 4 (Findings) Galen and Paul both mentioned that faculty development session
mainly focused on facilitating group discussions – how to talk less themselves and engage learners in conversations. Jane had even less time to critically reflect on her beliefs about teaching as she was overwhelmed with learning both the anatomical and clinical content of the course and only had the opportunity to learn about the standard of student-centered teaching through her conversations with Paul. Even though Galen and Jane both agreed with the idea of student-centered teaching and made steps towards embodying that orientation in their practice, they still appeared to fall back on their habits of telling students information rather than asking questions, and in Jane’s case feeling the need to cover a certain amount of content. This tendency to revert to their old teaching strategies may indicate that Galen and Jane did not go through the same degree of transformation of orientation as Paul which may be a result of not having the same opportunity for concentrated reflection. Kyle illustrated the challenge of reverting back to old habits when explained,

*The problem is you walk up to a table and a student says, ‘What’s that?’ And you know what it is. Not only do you know what it is, you know everything about it and then the problem is changing behavior.*

**Embracing a “beginner’s mind”**

After a shift from teacher-centered to student-centered teaching, the second explanatory concept characterizing the experience of basic scientists transitioning to an integrated curriculum is having a “beginner’s mind”. Stemming from Zen Buddhism the phrase “beginner’s mind” originates from the Japanese word *shoshin*. In his book “Zen mind, beginner’s mind”, Shunryu Suzuki explains how a beginner’s mind is one that is “empty” and receptive (1970). He states, “If your mind is empty, it is always ready for anything; it is open to everything. In the beginner’s mind there are many possibilities; in the experts mind there are few.” (Suzuki, 1970, p. 21) Epstein adopts this Zen concept of a beginner’s mind as one of the characteristics of a mindful practitioner – someone who “attends, in a nonjudgmental way, to his or her own physical and mental processes during
ordinary everyday tasks to act with clarity and insight" (1999, p. 836). He applies the concept to the practice of medicine describing how with a new patient, for example, a physician with a beginner’s mind is open and allows for new diagnostic and therapeutic possibilities. On the other hand, the observations of a physician with an expert’s mind may be limited and confined by her previous experience (Epstein, 1999).

“Beginner’s mind” was a term used by Paul to describe how he was able to make the change into a field that was not his own. However, despite only Paul using the specific phrase, all of the participants appeared to reflect the Zen conceptualization of a beginner’s mind - one that is open and ready for any possibility. This mindset was reflected in particular by the participants’ willingness to start from scratch, openness to try new things, attitudes of continual learners, and willingness to work hard.

Willingness to start from scratch

Having the mindset of being willing to start from square one seemed to help enable the participants’ transition to an integrated curriculum. In Paul’s words they had to “totally tear the course apart and re-build it”. Paul’s attitude of being willing to start from scratch was exemplified even before the design of the new course when in his first faculty position he was asked to revamp the PA (physician’s assistant) anatomy course. Jane was starting from square one in many respects; moving to a new city, a new job, new colleagues, new clinical content. As mentioned in Chapter 4 (Findings) it was not as if Galen, Paul and Jane were starting entirely from scratch. They all had previous teaching experience, and to some extent had all been exposed to clinical examples. Galen described how even though they were not literally starting over, it felt like they were. The feelings they described in talking about the initial transition to the integrated course mirror those that accompany trying something for the first time. Paul spoke about the uncertainty and self-consciousness of using clinical
language, Galen described his feeling of anxiousness when he started teaching the new curriculum in the lab, and Jane talked about the “scariness” of all the things she was doing for the first time. What was notable about Galen, Paul and Jane is that they appeared to meet these feelings of anxiety and fear with a “beginner’s mind” - A mind that was open to the uncertainty of their situation and motivated them towards learning rather than resistance. As stated by Galen, “Being slightly insecure is just a part of life … that’s part of what keeps you on your toes is the fact that-- not the fear but the realization you’re likely to say something wrong, it keeps you humble.” A passion for teaching and learning is what seemed to motivate them to persist through these feelings of uncertainty. As stated by Jane, “I love this stuff. I want to learn it … And I know it’s going to take time and that’s fine. But I love anatomy. It makes me really happy and it’s super fun.” Similarly Paul talked about how learning the new aspects of the course was exciting and interesting, and Galen described how he liked it and it was enjoyable. Kyle observed, “well, the one thing is that they love teaching. They-- I don’t know if it came across. Every one of them loves teaching. They love being with students.”

Openness to try new things

In addition to being willing to start from scratch, another factor exemplifying the participants’ “beginner” mindsets was that they all demonstrated a propensity to try new things. Each had at some point in their academic careers switched fields; Paul from biochemistry to cell biology, Galen from neurobiology to anatomy, and Jane from anthropology to anatomy. Paul explained how when he first came to Lillian Douglas Galen “gave a lot of rope to try new things”. Together they investigated using computers in teaching anatomy and made plans to make changes to the old course before the benchmark of 100 hours was set. During my time at Lillian Douglas I continually observed Jane trying new things in her teaching. She constructed a pelvis model with paper muscles and ligaments for her students to use in seminar, and used fun anthropology examples like
demonstrating how apes walk in order to explain gait. Paul had mentioned that he had recently picked up playing the cello. With an entirely new curriculum as well as a new approach to teaching this willingness to try new things appeared to be a key factor in transitioning to the new course.

Attitudes of continual learners

Another characteristic of participants that points toward their beginner’s mindset is their attitude to keep on learning. It is perhaps not surprising that Jane, being at the beginning of her career would be in the midst of a steep curve of learning, but Galen, likely within five years of retiring still had a “list” of things to learn. In addition to explaining how he wanted to learn how to use the surgical tools, he also mentioned his desire to learn more about laparoscopic surgery as well as the social and ethical factors surrounding each case. The fact that both Galen and Paul were willing to take on learning new clinical content and new pedagogical approaches later in their careers demonstrates their attitudes of being continual lifelong learners.

Willingness to work hard

The participants’ willingness to study and learn the clinical content of the course also exemplifies their mindset as beginners. The effort and time required to transition to an integrated curriculum was best captured by Jane when she said, “the thing is there’s no good way to do this. It’s just a lot of work.” Galen, Paul and Jane were able to make the change to teaching anatomy in the clinical context as well as incorporate new strategies into their teaching because they were willing to put in the time, effort, and work that was required. As described in Chapter 4 (Findings) learning the clinical content entailed a lot of studying on their own - reading surgical textbooks, using web programs to study radiological images and continually looking up medical terminology. They all described the work of learning the clinical content as studying as if they were students. Paul
mentioned practicing clinical terminology with his wife at home, and Galen mentioned how being able to reiterate and rehearse the clinical content in other anatomy courses was helpful practice for learning. Similarly, although via a different approach, learning new teaching strategies also required work and practice. This meant that in addition to having to take extra time to learn the clinical content surrounding the cases during implementation, Galen and Paul also took time to meet on a weekly basis and discuss with Kyle and the rest of the anatomy faculty about the student-centered approach to teaching. Galen said, “with respect to [our] teaching Kyle worked on us pretty hard for about two years”. Thus, a factor that was key in enabling them to transition to an integrated curriculum was the willingness to put in the time and effort required to learn new content and a new approach to teaching.

**The maintenance of control**

The third explanatory concept characterizing the experience of basic scientist transitioning to an integrated curriculum is the maintenance of control. Control in the context of this study means having the power to make decisions. Before the transition Galen and Paul were in complete control of the content of the course. They had the power to decide what was important – what was included, or not included in the content of the course. As Galen mentioned, before Paul came to Lillian Douglas, “all the major decisions were mine”. After Paul’s arrival, they both contributed to decision making. As stated by Paul, “what Galen put on the test was his view of what was important. What I put on the objectives [was] my view of what was important.” Before the transition Galen and Paul also had control over their teaching strategies. The choice of how to engage students with the content of the course was completely up to them. In short, Galen and Paul were in control of both what they were teaching in terms of content, and how they were teaching in terms of strategies. Even when the dean imposed the mandate that the course needed to be less than 100 hours they were still the ones making decisions in terms of what content should be cut and what content was important
to keep in the course. As the process of cutting content went on, however, they started to feel uneasy about being the ones in control – the ones making the decisions. As Paul stated they were in a “conundrum” of deciding what to teach, and Galen noted how they were “self-conscious” about making the decisions. Galen explained how this discomfort with being the decision makers stemmed in part from their concern that their choices would have a detrimental effect on the training of their students. He stated, “we wanted to be sure that the stuff … we were going to jettison wasn’t critical to their careers.”

Although the requirement to get the under 100 hours was set by the dean, the decision to use clinical cases to frame the content of the course was Galen and Paul’s. As they met with all the surgical specialists, clinicians were contributing what content should be included in terms of cases and surgeries, but it was Paul and Galen’s “vision” or design for the course that was directing the information they were gathering. For example, Paul noted that when the surgeons said “well tell us what you want to teach and we’ll come up with a case,” his response was “No, no, no I want cases that every student has to see”. Paul and Galen were also still in control of the content in terms of developing and putting together the course. Paul explained how he worked from the cases and information provided by the clinicians to develop questions and steps students could follow as they completed the procedures in lab. Thus, although the content of the course was being informed by clinicians, Galen and Paul still had full control in terms of the design and development of the course. It was like building a house where Galen and Paul had a vision and developed blueprints for what it would look like, they went to different clinicians to gather materials (cases, patient histories, scans etc.), and then they proceeded to do the actual construction themselves. Although Galen and Paul did collaborate with clinicians to help decide what should be included in the course (what students as future physicians should know), they were still in control of deciding how that clinical content would be structured and putting together most of the cases.
Although Galen and Paul were still the ultimate decision makers in terms of how the course would be put together, Galen described how having to seek input from clinicians was one of the biggest challenges of the transitioning to the new curriculum. As mentioned in Chapter 4 (Findings), he said it was like sending your kid to college, “you were in control of what they knew and suddenly you were putting them into someone else’s hands”. Similarly, Galen also noted how it was a difficult step because we all like to think that we know what the students need to know, and it’s particularly dangerous when you’re basic science faculty who haven’t had any clinical experience—and you think you’re pretty good at teaching. So it’s sort of tough to—that was a big step for us to go to the people who do physical exam, and the surgeons to say, well, you know, what three or four things would you really like the students to know?

Despite how challenging it was to step out beyond their context of teaching, collaborating with clinicians is what ultimately eased the discomfort Galen and Paul felt in being the ultimate decision makers in determining what content was important to include in the course or not. As stated by Paul, “I feel much more comfortable … knowing that the material I’m teaching has been validated by people that actually use it. So I’m no longer guessing what’s necessary.”

With anatomy being a fairly stable discipline the content of the old curriculum (like most traditional anatomy courses), largely stayed the same. Galen and Paul did not have to worry about continually updating the content of the course because there were no changes in the anatomy. Paul noted that they did investigate ways to adjust their teaching strategies in an effort to find better ways to deliver content, but the content in itself did not change. As described in Chapter 4 (Findings), years after the integrated course was implemented there now appears to be a rising tension between the need to change what the clinicians who teach in the course perceive to be outdated surgical procedures,
and keeping the same procedures because Galen and Paul still regard them as being useful in elucidating the anatomy.

It seems rational to continue to include surgeries in the course that used to be carried out as open procedures but are now commonly performed laparoscopically. For example, removal of the gall bladder or the appendix are now laparoscopic surgical procedures. The anatomy lab is the perfect place to explore and learn structures using “open” surgical techniques, that students will later be viewing with a camera and computer screen. Paul noted how surgical residents love to volunteer in the lab because it gives them a chance to review everything in the open. However, outside of laparoscopic surgery, or any other future surgical technique that will further minimize the size of incisions, continuing to include cases in the course that will not even be mentioned or used in teaching hospitals appears to go against the vision for implementing cases which was as Paul stated, “They should be common clinical cases, anatomy-rich cases. So that when students go on the floors, in whatever venue, they’re going to see cases like this.”

When Paul and Galen were in the process of developing the course they were very willing to seek out the input of clinicians in order to determine what students needed to know and what surgical procedures and cases would make up the new anatomy course. Although Galen in particular described how asking the physicians what students needed to know was a challenge, they were largely open to the suggestions of physicians in order to develop the course. Years after implementation, however, it seems that the basic scientists are less willing to receive feedback in terms of deciding what the clinical content of the course should entail. It appears that past the unique phase of course development when clinical expertise was sought out in order to decide what was important, the receptivity of input from clinicians has decreased. For example, Jane described how at a recent faculty meeting, “Blaine”, one of the core anatomy faculty who is
also a practicing surgeon, tried to give his input regarding the relevance of one of the cases in the course. She explained,

*Blaine said, ‘So we don’t do-- I’ve never done a vagotomy.’ And Paul said, ‘Well, but they still do it in the E.R., right, for emergencies.’ And Blaine just said, ‘No, no, they don’t. It’s just not done. And Paul said, ‘Well, it’s still a good way to teach them about the anatomy.’ And that was the end of the discussion.*

Thus it appears that Paul’s control over the course in particular has recently become more apparent in that he has the power to decide whether or not to incorporate feedback from clinicians on how the course may be improved.

The content of the course is still framed within clinical cases, but input from the surgeons suggests that change may be needed if the course is going to remain within the ideal of including common cases that students will see as they transition to teaching hospitals. The fact that the content of the course has stayed largely the same despite the changing context of clinical medicine may be because anatomists in general, given the relatively stationary nature of their discipline, are not habituated to having to continually alter the content of their courses. As clinical procedures will continue to change, this tension between trying to keep the cases within the course up to date while still illustrating anatomical concepts appears to be one that will be ongoing and will need to be managed if the course is to remain congruent with the ideal of including clinical cases that students will see on the wards. This does not appear to be a question of having to give up control of the course, but rather keeping up to date may require rekindling the initial receptivity of input from clinicians that appears to have dwindled over time.

Within the organizational change literature the concept of control has been found to play a prominent role in dealing with the stress and uncertainty of making job-related transitions. Ashford’s (1988) study of a major organizational change within a regional Bell telephone operating office found that those who perceived
high levels of uncertainty and disruption related to the transition, but believed they could control the situation, felt less stress. She concluded that the feeling of personal control is one of the most useful buffers of transition-related stress (Ashford, 1988). Bordia et al.’s study of the restructuring of staff at a psychiatric hospital similarly found that participants’ level of control was negatively related to uncertainty and psychological strain (Bordia, Hobman, Jones, Gallois, & Callan, 2004). In parallel work looking at the “de-merging” of a state government department, Bordia et al. determined that job-related uncertainty was negatively related to control, and that employees who have greater opportunities to participate in decision making experience less psychological strain during times of transition (Bordia, Hunt, Paulsen, Tourish, & DiFonzo, 2004). The findings of these studies are consistent with Terry and Jimmieson’s (1999) and Barnett and Brennan’s (1995) work that point to control as being a key factor for employee well-being. These studies suggest that the fact that Galen and Paul have essentially been in control of the integrated course since its inception may be an integral factor in their ability to successfully make the transition at least in terms of dealing with the uncertainty, stress, and psychological strain that accompanies job-related change. Although Jane was not part of developing the course her realization of the control she has in that she can “do her own thing” in terms of teaching strategies, may have similarly helped her make the change to a completely new way of teaching.

A transformation of identity

The last explanatory concept characterizing the experience of basic scientists transitioning to an integrated curriculum is a transformation of identity. This section will first discuss the ways in which participants’ identities were unraveled as a result of the transition. It will then describe how their identities have been redefined in terms of their predominant role in the new course. Lastly it will consider participants’ identities with respect to their perceived credibility in teaching anatomical versus clinical content in the integrated course.
Identity unraveled

In the transition to the integrated curriculum, changes in both content and teaching strategies appeared to contribute to the loss of certain aspects of the participants’ identities as teachers. These included aspects of their anatomical language, their expertise in certain anatomical regions, and their status as “popular” and well liked professors in the eyes of students.

Language

In transitioning to teaching anatomy in the context of clinical cases participants had to largely give up their language as classic anatomists. If you have ever attended a traditional medical school anatomy lecture you will notice how professors often differentiate between what anatomists call a structure and what clinicians refer to the structure as. Galen described how some anatomical terminology used by physicians (in particular eponyms), is regarded by anatomists as “street language”. Teaching what students need to know meant that clinical terminology would take precedence over classic anatomical terms. Thus in leaving the old course and their traditional language of anatomy behind, they were giving up an integral part of themselves.

Area of expertise

Another aspect of the participants’ identities that seemed to be lost in the transition to the integrated curriculum was related to the fact that anatomists, in general, tend to have a specific area of anatomical expertise. The culture among anatomy educators in most universities is that there are “regional specialists”, with regions referring to different anatomical areas of the body for example the abdomen or limbs. Usually they are specialists not by official training or certification, but rather from being designated to teaching the same body region year after year. For example, there will be Dr. X, who is the “head and neck” guy,
and Dr. Y who always teaches the thorax. Even Jane who had only been teaching anatomy for just over a year identified herself as a limbs specialist as her background in anthropology made her more familiar with that region. As Paul explained, “I don’t think I’ve ever met an anatomist who knew of an anatomical structure that he or she did not love.” As mentioned in Chapter 4 (Findings), transitioning to the new curriculum meant that they had to let go of anatomical areas that they were particularly passionate about and experienced in teaching. Galen noted, “we weren’t going to talk about the things that were near and dear to our hearts.” No longer being able to identify themselves, and have students identify them as “the limbs expert”, or “the pelvis prof”, for example, meant a significant loss of their identity as teachers. It would be somewhat similar to telling a clinician that they can no longer practice their specialty.

**Status**

Galen and Paul were both award winning teachers who were well liked and rated highly by students. As Galen explained, “we regarded ourselves as very popular and very successful”. Kyle, the education expert noted, “Galen, you know, is a legendary faculty member. Very, very funny. A very popular lecturer.” Although the standard of student-centered teaching strategies of the new course (not giving students answers or providing them with resources) had learners’ best interests at heart, they were not initially embraced by the medical students at Lillian Douglas. Surveys Paul conducted to assess the course showed that in the first year of implementation students’ satisfaction declined. This is perhaps because the course ceased to follow the trend of their previous schooling - they were no longer provided with all the information they needed to memorize in order to pass the test. For award winning teachers who are used to being highly rated, not being “liked” by students and receiving poor ratings on student evaluations implies a significant loss to who they were as teachers. As stated by Galen, “you’re always fearful that somebody’s going to say you’re terrible.” Thus, although the teaching strategies of the integrated course were perhaps better for
students in the long term in helping them developing skills for learning and solving problems, it meant not necessarily being “liked” by them as the new teaching approach largely contrasted their prior learning experiences.

Identity redefined

Along with the loss of certain aspects of participants’ identities as anatomists came a redefining of themselves in the integrated course. It seemed that the more predominant role Galen, Paul and Jane took on in the integrated course was as teachers rather than basic scientists or anatomists. I am not implying that these roles can be completely teased out because the knowledge and skills related to basic science research and anatomy both contribute to teaching (I will suggest how later in this section). But it appeared as if the participants’ teaching and skills at facilitating students’ learning are what mainly define the role they have taken on in the integrated course rather than their skills as researchers or their anatomical knowledge.

The role of basic scientists in the integrated course was best captured by Paul when he said, “you know your students, you know where they are. You want to have a sense of where they’re trying to go. And you’re trying to bridge the gap.” The “gap” in this case is between first year medical students and the clinical profession they are aspiring to become a member of. The participants appeared to help students “bridge the gap” in a couple of ways. The first relates to Paul’s statement, “you know your students.” Galen, Paul and Jane are part of the core anatomy teaching faculty. I observed how they see students on a regular basis and have a very good idea of where each student is at in terms of their learning. They know who among the students is doing well, and devote part of every faculty meeting to discuss students that may be struggling or need extra help. I saw how the faculty have an opportunity to interact with students nearly every day, and students appeared comfortable and willing to approach them with questions. This close relationship between students and anatomy faculty
facilitated “bridging the gap” because times when, either in lab or seminar, a student may be too intimidated to ask a visiting surgeon or resident a question, the basic scientists act as mediators between the two. For example, Jane explained,

[students] don’t know this person who just walked in and wrote [his] name on the board. And maybe they’re not going to be 100 percent comfortable asking questions. And so they tend-- even though they know that I can’t answer their radiology questions, they’ll ask me and I’ll be, like, let’s go ask the radiologist.

This continuity the basic scientists provide appeared to facilitate the interactions between students and clinicians. Similarly Paul spoke about how he bridges the gap between students and clinicians by ensuring that teaching moments between the two happen when opportunities arise. He explained,

That’s a role that I have that [clinicians] don’t have. It’s find where their expertise is needed and get them to that place. They wander around broadly, you saw it. But where there’s a particularly interesting thing where a clinician can do something that we can’t, I’m going to-- you know, part of my role is to get them there.

This role of facilitating interactions between students and clinicians appears to contrast the participants’ experience and work as researchers. Galen, Paul and Jane each moved from the context of individual lab work to a collaborative teaching environment. Paul in particular described himself as an introvert and explained how for the most part prior to the change he liked to be in his research lab doing his own thing. His role as course director of the integrated course has moved him from being secluded in a lab to being a collaborative facilitator of anatomy and clinical faculty. Paul’s new role involves initiating and maintaining relationships across professional and surgical specialty boundaries.

Secondly, the basic scientists, and in particular Paul, bridge the gap between the clinical profession and students by offering suggestions to the visiting surgeons or residents for how they can better teach their clinical expertise. For example,
before the radiology seminars, which are largely led by residents, Paul takes time to suggest how they might be more clear in teaching their clinical knowledge that has become second nature to them. He said,

\[
I \text{ always have a meeting before with the residents. I say, be transparent with your logic. Ask the students what do they see. Tell them what you see. ‘Cause in the beginning, residents would say, oh, well, I’ve seen a million of these, so I just know that’s what it is.}
\]

Paul explained that he and Galen have also taken time to make suggestions regarding teaching to some of the clinicians who give lectures in the course. He said, “Some lecturers we had to work with a little bit in terms of getting them more asking questions, cutting down number of slides, things like that.”

The foregrounding of participants as educators in the integrated course rather than researchers or anatomical experts was further exemplified by how they identified and talked about themselves. For example, in comparing himself to the surgeons Galen said, “I think I’m a better teacher than they are, but they know a lot more anatomy than I do so-- you know, we cede territory to each other.” This statement, although perhaps surprising at first that anyone would know more anatomy than an anatomist, is understandable in that the surgeons who volunteer in the lab that Galen is referring to are specialists. They have spent their entire career embedded in the anatomy and surgery of one particular region. Anatomists on the other hand are more like anatomical “generalists”. From my observations as well as my own experience as an anatomy educator, compared to surgeons who know the minute intricacies of a specific area, anatomists have a broader understanding of all the anatomical regions. Although as mentioned previously anatomists may have an anatomical region that they are known for specializing in and teach regularly from year to year, they will still only know this area to the level at which they have to teach it, which is predominantly for first and second year medical students, not a practicing surgeon. Thus, although most would label Galen as an anatomist, in relation to surgeons, he foregrounds his expertise in teaching rather than anatomy. Paul similarly
downplays his anatomical expertise in saying, “I don’t know all this anatomy that other people are struggling not to teach. I never learned it not to teach it. You know what I mean?” His zeal for education however was demonstrated when he said, “there’s not enough thinking, I don’t feel, about the art and science of teaching.” Thus, it appears that the predominant role the basic scientists play in the integrated course is as educators who “bridge the gap” between students and clinicians rather than as researchers or anatomists.

As mentioned earlier in this section the participants’ knowledge and skills as researchers and anatomists are likely intertwined within their role as educators and may be influential in helping them “bridge the gap” for students. As noted in Chapter 3 (Methods), basic scientists are trained in testing hypotheses, quantifying data, correlating variables and finding the answers to problems. As stated by Paul, “What I have to offer is how to manage complex data, volumes of data, distill it down to a core question, find a way to answer it. That’s what I’m trained in.” This framework for solving scientific problems parallels the clinical case framework and is thus applicable to helping students learn how to collect “data” from the patient in order to deduce what potential hypotheses or diagnoses there could be. The framework for solving problems in science can also inform the guidance of students through the surgical procedures in the lab. As previously quoted by Galen (Chapter 4 – Findings),

*What’s the patient’s problem and what’s the anatomy underlying it and, well, since this is anatomy lab, we aren’t going to give you drugs. We’re going to take it out. And so in the context of taking it out, why are we coming in from the right and from the left and if you come in from the right what can we hurt, what’s nearby that can be damaged.*

In terms of participants’ anatomical knowledge, although transitioning to the clinical framework involved letting go of parts of their anatomical lexicon their overall knowledge of anatomical terms appeared to play a significant role in allowing them to communicate with physicians and thus help bridge the gap for students. In sum, although the participants’ mindsets and knowledge as
anatomists and researchers informed their teaching, their more prevalent role in the integrated course appeared to be as educators who help bridge the gap between their students and clinicians. This role of “bridging the gap” appears to reflect the work of what the social learning literature describes as “brokers” or “boundary workers” (Akkerman & Bakker, 2011). The role of a broker is to negotiate the boundary between different communities of practice. As defined by Wenger (2006) communities of practice “are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly.” Communities of practice are made up of practitioners, a group of people working together within an occupation or towards a common goal (Wenger, 2006). Wenger (1998a) outlines three characteristics of practice that are a source of coherence for a community; 1) mutual engagement – the interaction between members of a community; 2) joint enterprise – a shared understanding of what the community is about and why they do what they do; and 3) shared repertoire – the resources they use and share including physical artifacts as well as language. Contextualized in medical education, basic scientists and clinicians have different ways of interacting with their colleagues, have a different understanding of the goals and motivations of their profession, and utilize different language and tools as they go about teaching basic science or practicing medicine. In other words, these three dimensions are how the practice of teaching basic science and the practice of medicine come to be defined as different communities of practice.

When members of different communities of practice intersect, boundaries arise because they have different ways of engaging with one another, are motivated by different enterprises, and communicate with a different repertoire. As noted by Suchman, “crossing boundaries involves encountering difference, entering into territory in which we are unfamiliar and, to some extent therefore, unqualified” (1994, p. 25). “Unqualified” within this framework translates to a lack of social competence, the inability to appropriately engage, understand the enterprise or speak the language of another community. Through collaboration and engaging
with physicians the basic scientists in this study became somewhat “qualified” in that they were able to gain a certain amount of social competence to be able to interact with members of the clinical community in a meaningful way. This partial understanding of the clinical world then allowed them to “bridge the gap” between students and the community that students were aspiring to become a member of.

Wenger defines “brokers” as individuals who make new connections between communities of practice and translate between them (Wenger, 1998b). What is interesting is that in the context of this study the basic scientists are acting as the brokers working to bridge the gap between students and the clinical community, rather than physicians whose expert knowledge and skills may be too far embedded within the practice of their profession to enable them to engage with first year students in a meaningful way.

The concept of brokering also speaks to the uncertainty that Galen mentioned even after years of teaching in the integrated curriculum. Wenger describes how spanning the boundaries between two different communities is not always comfortable (Wenger, 1998b). Galen appeared to express this feeling of discomfort of not “fully” being a member of the clinical community when he said, “You just feel a little bit uncertain. I mean, as if you’re, you know, as if I’m not really qualified to say it, but I’m just saying it anyway.”

**Content credibility**

Transitioning to an integrated curriculum meant that the participants would be teaching clinical content when they are not physicians themselves. This appeared to put into question their sense of credibility in teaching the clinical aspects of the course. What I mean by “content credibility” is the sense of ownership the participants had over the content they were teaching. Someone who “owns” an area of content is confident in their knowledge and expertise and therefore embodies a sense of authority over the subject and their ability to teach
it. In the context of the integrated course at Lillian Douglas, the content credibility of basic scientists differed with respect to their sense of ownership over the anatomical content, versus their sense of ownership over the clinical content.

**Anatomical content credibility**

In terms of content credibility with respect to anatomical content, Galen and Paul differed from Jane in that they both had years of experience teaching anatomy. An instance illustrating this difference in anatomical content credibility occurred during a lecture I observed that Paul delivered. He was giving an introduction to the limbs, and forgot the name of an arm movement. Galen, who was sitting in the front row had a similar lapse of memory and could not help his colleague in terms of remembering the terminology of the movement. Given his experience and status as an expert anatomy educator, despite making an obvious error Paul was not troubled by it, and neither were students. In fact, they all joked about it. Jane reflected on this moment during an interview and noted,

*They [Galen and Paul] can’t come up with medial and lateral rotation. And that’s okay … I think there’s a little bit of age there, like they know they know it and it’s not that big a deal. And actually the students appreciate it when they see them make mistakes.*

Another instance that exemplified the difference in content credibility between Jane and the more experienced anatomists was when Jane described how she had to get Galen to come over and help her identify an organ she was uncertain about. When she later found out it was the kidney – a structure she felt she should know – she described feeling somewhat embarrassed. So unlike Paul who was not overly concerned about making an anatomical error because of his position as a content expert, Jane was still trying to build her credibility as an anatomy instructor and was concerned about students seeing her make a mistake. Jane explained,

*I feel like the expectations are a little higher for me … you look at me, you look at Galen, the students just expect different things and I think the*
pressure feels higher on me. I want them to respect me and I worry that every tiny misstep that I make or I say something wrong and all of a sudden they’re just going to be, like, pffft, we’re never listening to her because she doesn’t know what she’s talking about.

Thus, in terms of anatomical content credibility both Galen and Paul, having years of experience teaching anatomy, “own” the content to the point where even if they say something wrong it does not phase them because they know they know it. Jane on the other hand being in the early stages of her career, and relatively new to the field of anatomy, does not appear to have attained the confidence of “owning” the content.

Clinical content credibility

With respect to clinical content credibility, Chapter 4 (Findings) described how the clinical knowledge Galen, Paul and Jane learned in order to teach in the integrated course was somewhat limited by the selected cases of the course. This limitation, however, did not seem to be a problem in the integrated course, firstly, because the extent of their clinical knowledge was congruent with the level of the first year medical students they were teaching, and secondly, because they were in a context of continual collaboration with clinicians. When Galen, Paul and Jane found their clinical knowledge was lacking, they were able to consult with a clinician to fill in any gaps. So a limited extent of clinical knowledge did not appear to be problematic in an integrated curriculum given a context of collaboration. However, although the scope of clinical knowledge required did not seem problematic, the participants’ sense that they lacked credibility to teach the clinical aspects of the course appeared to be somewhat of a source of tension. By tension I mean that the participants’ perceived lack of credibility seemed to contribute to a state of uncertainty with respect to teaching the clinical aspects of the course. As mentioned in Chapter 4 (Findings), Galen said, “You just feel a little bit uncertain. I mean, as if you’re, you know, as if I’m not really qualified to say it, but I’m just saying it anyway.” Similarly Jane expressed, “since I don’t
have any clinical background there’s-- I can’t speak to [the clinical content] with any real, you know, information." Paul, on the other hand, did not allude to any perceived lack of credibility with respect to the clinical content but rather mentioned that in terms of using the clinical language stated how “it’s just become second nature. It’s what I do.”

Similar to how collaboration helped fill in the gaps of the basic scientists’ clinical knowledge, having clinicians in the lab also appeared to help manage the lack of perceived credibility Galen and Jane expressed having in teaching clinical content. As previously quoted by Galen, “it’s reassuring to have somebody with a clinical background as well just to, you know, to either make me feel more comfortable or make the students feel more comfortable that what I’m saying is relevant” (Chapter 4, Findings) Thus, it seemed that the context of collaboration in the integrated course is what largely helped basic scientists deal with both having a limited extent of clinical knowledge, as well as their sense of being less credible in teaching it.

In transitioning to the integrated course Galen, Paul, and Jane had to learn a new clinical language and framework for teaching anatomy. Wenger describes the degree that we can comprehend a concept, idea or perspective and assert it as our own as “ownership of meaning”(1998a). In general, anatomists have full ownership of anatomy as it is traditionally organized. Using Wenger’s language, in order to teach in the integrated curriculum Galen, Paul and Jane had to learn and develop some ownership of how physicians use anatomy, but not full ownership as they were not training to be physicians themselves and were in context of collaboration with physicians who could fill in the gaps and confirm their use of clinical content in their teaching. Having to re-learn anatomy in a clinical way does not seem to only be a matter of learning anatomy differently, but also a matter of professional identity. It is about developing new competence and therefore new teacher selves in relation to their field of anatomy. Wenger’s concept of “ownership of meaning” helps us see that, given a context of
collaboration, the transition to an integrated curriculum was not about basic scientists becoming fully competent in something they’re not, but being competent enough, “owning” the clinical perspective enough, that they could teach at the level of their medical students and converse with the clinicians they were collaborating with. It is worth noting, however, that participants’ limited ownership of the clinical content seemed to have implications for how comfortable they felt with the idea of new clinical content being added to the course, a topic that I will pick up in the last chapter of the thesis.

**Conceptual framework**

In this section I will use Pratt’s General Model of Teaching (GMT) (1998) as a framework to help draw together the explanatory concepts that characterize the experience of basic scientists transitioning to an integrated curriculum. The model consists of five elements and three relationships of teaching (Figure 5.2). The five elements include students, teacher, content, ideals, and context. What Pratt describes as “ideals” is similar to what I have been referring to as teacher “orientation”. As such I have added the word “orientation” in parentheses in the model and will continue using this term in the discussion. For the purpose of this study I have interpreted the three relationships as: 1) The line between students and content, which represents the teaching strategies used to engage learners with the content of the course, 2) the line joining students and teacher, which signifies the student-teacher relationship, and 3) the line connecting teacher and content, which corresponds to content credibility – the sense of ownership or authority the teacher feels they have over the content, or their perception of the credibility they have in teaching it. Each of these elements and relationships hold different significance to different teachers, and that significance may shift as they progress in their practice and as the profession gradually changes over time.
My hope is that as a unifying framework the GMT will be useful in bringing together and illustrating diagrammatically the explanatory concepts discussed thus far. My reason for selecting this model is that its inclusion of multiple elements and relationships provides a useful language to talk about the multifaceted and complex nature of transitioning to an integrated curriculum. I will first use the model to depict the participants teaching before the transition to the integrated curriculum, and then use it to illustrate how their teaching changed after the transition.

**General model of teaching before the transition**

Before the transition to the integrated curriculum participants’ orientation as teachers was largely characterized by a “teacher-centered” approach. In other words, they believed that effective teaching is when a teacher, who is the source of the subject content or knowledge, effectively delivers that knowledge to
students. In terms of the GMT, the emphasis of this approach to teaching is on the elements of teacher and content as illustrated by the orange shading in Figure 5.3. The curved dashed arrow (Figure 5.3) depicts how the teacher-centered orientation was manifest in the participants’ teaching. Starting with the teacher, the arrow courses through the content to students, symbolizing the delivery of knowledge from a content expert to students. The arrow also courses through the relationship between teacher and content which in the model is characterized as content credibility. This speaks to how before the transition the participants (with the exception of Jane who was in the early stages of her anatomy teaching career) had ownership over the content of the course which was largely anatomical facts. In addition, the dashed arrow also courses through the relationship between content and students which symbolizes the teaching strategies used to engage students with the content. The directionality of the arrow going from content towards students illustrates how teaching strategies
before the transition largely involved the participants delivering content to students. The yellow text in Figure 5.3 illustrates how before the transition the basic scientists were in control of both the content of the course as well as the strategies used to deliver that content. Equally as important as what was emphasized in the participants’ teaching before the transition is what was not. As depicted by the left hand side of the GMT there was less emphasis on the element of students in the participants teaching prior to the transition to the integrated curriculum. As previously quoted by Paul, “you don’t need to know what the students know or don’t know. They laughed at your jokes. They asked one or two intelligent questions. You feel you did a good job, and you’re done.” This is not to say that participants did not hold their relationships with students in high regard, as evidenced by the importance they placed on student evaluations and the positive response they received on them. But in terms of what they were trying to accomplish in the classroom, being aware of students’ level of knowledge and understanding, and adjusting how they delivered content to push just beyond that level was not a priority.

**General model of teaching after the transition**

The change in participants teaching as they transitioned to the integrated course can be depicted by a shift in the emphasis of certain elements of the GMT. For example, in contrast to their previous teaching, participants teaching in the integrated course largely foregrounded students rather than teacher and content (illustrated by the orange shading in Figure 5.4). This shift toward a “student-centered” approach appeared to be related to the extent of change in participants’ teaching orientation. The foregrounding of students was manifest in both facets of change in the course. Firstly, in the change in towards clinical cases, the content of the course was now focused on what students needed to know, and secondly the change in teaching strategies towards helping students develop the skills to solve problems and learn on their own. The curved arrow, now coursing in the opposite direction through students to the content, indicates
how in the integrated course it is students’ responsibility to take initiative in their learning and engage with the course content rather than it being presented or delivered to them by faculty. The teaching strategy participants aspire to use in order to engage students with the content thus involves a “Socratic” approach of questioning where faculty guide students in order to improve their problem solving skills rather than giving them answers.

Figure 5.4 – GMT after the transition to the integrated curriculum

In contrast to the GMT before the transition, the curved arrow no longer courses through the relationship between teacher and content illustrating a shift in the emphasis of the participants' content credibility in the new student-centered approach. In other words “ownership” of the content is not as integral to their
teaching when their role is now to facilitate students own learning of the material rather than delivering the knowledge they possess. Despite the repositioning of the arrow, and thus the de-emphasis of needing to “own” the content, there was still an important shift in terms of the participants’ sense of content credibility in the integrated course. Where content-credibility before the change was with respect to *anatomical* content, content credibility in the integrated course includes both anatomical and *clinical* material. As described earlier in this chapter perceived lack of credibility with respect to the clinical content seemed to contribute to a state of uncertainty for some participants. However similar to how collaboration with clinicians helped the basic scientists fill in the gaps of their clinical knowledge, the presence of physicians in the course also seemed to ease the perceived lack of credibility some of the basic scientists appeared to feel in teaching clinical content.

I have made a few additions to Pratt’s model in order for it to better reflect the context of this study: collaboration, beginner’s mind, and control. Firstly, collaboration with clinicians is what allowed Galen and Paul to determine what students needed to know in terms of clinical content. In addition, collaboration with educational experts including Kyle as well as the teaching professionals Paul engaged with at Harvard Macy, facilitated the change toward the new student-centered teaching strategies. Seeking clinical and pedagogical expertise from outside the context of the anatomy community appeared to play an integral role in the transition to the integrated curriculum. Secondly, the willingness and motivation to take the steps to engage with these collaborators seemed to come from participants adopting a “beginner’s mind” including the willingness to start from scratch, try something new, and work hard to learn the new clinical aspects of the course. Thirdly, as depicted by the yellow text in Figures 5.3 and 5.4, both before and after the transition to the integrated curriculum the participants still remained in control of both the content of the course and the strategies they chose to deliver it. Despite Galen and Paul being told by the dean that the course had to be less than 100 hours, and acceding to the input of physicians, they were
largely, if not solely, in control of what content (albeit clinical) would be in the course and what the cases and structure of the course would look like. Although participants were in control of the teaching strategies they used, even after the transition to the integrated curriculum, they still experienced uncertainty when engaging students with clinical cases compared to the straightforward delivery of content in the previous course.

Summary

This chapter discussed four explanatory concepts that characterized the experience of basic scientists’ transitions to an integrated curriculum. The first concept represents the perceived phenomenon (a shift in teaching orientation). The second represents one of the explanations participants articulated as a key enabling factor in the transition (beginner’s mind). The third represents a less apparent factor in the success of transition (the maintenance of control despite participants articulating a certain loss of control). The final concept captures some of the implications for participants with regard to their sense of themselves as teachers and anatomists (a transformation of identity). I will summarize each of these in turn.

The first was a shift from teacher-centered to student-centered teaching. This involved a change from teaching that was largely focused on the content expertise of the teacher and effective delivery of that content, to one that emphasized a relationship with the students and their learning. Students were foregrounded in terms of the change in content to what students would need to know as future physicians, as well as the change in teaching strategies to helping students develop skills for solving clinical problems and seeking information on their own. Collaboration appeared to be a key factor in enabling the change to a student-centered approach in that input from clinicians helped develop the clinical content, and working with pedagogical experts informed the new direction of “Socratic” teaching strategies. Unlike participants’ adoption of teaching clinical
content which appeared fairly uniform, the shift to student-centered teaching strategies seemed to be taken up to varying extents. Paul for example appeared to fully adopt the student-centered teaching strategies, with Galen and Jane more or less adopting the teaching standard of the new course, but sometimes reverting back to their previous ways of teaching. In considering Mezirow’s concept of transformative learning (2000) this variation in terms of change in teaching strategies may have been related to the extent of change in participants teaching orientation and the opportunity they had to critically reflect on their values and beliefs about teaching.

The second explanatory concept characterizing the experience of basic scientists’ transitions to an integrated curriculum was having a “beginner’s mind”. A beginner’s mind as described by the Zen Buddhist tradition was reflected in the participants willingness to start from scratch, openness to try new things, attitudes of continual learning, and willingness to work hard. Each of these aspects appeared to enable the changes participants had to make in transitioning to a new curriculum.

The third explanatory concept involved the maintenance of control. Essentially from the inception of the integrated course to now over eight years after implementation Galen and Paul have been in control in terms of what clinical content is included, and the strategies they each choose to teach it. The control the basic scientists have over the integrated course however has recently become more apparent as clinicians who are part of core teaching faculty have brought forward the concern that some of the cases and surgical procedures taught in the lab may be out of date. Contrary to the initial stages of course development where Galen and Paul readily sought input from physicians, they now appear to be somewhat less receptive of their feedback for how the course may be improved, and continue to have the power to decide if any further changes will be made.
The final explanatory concept characterizing the experience of basic scientists’ transitions to an integrated curriculum was a transformation of identity. The shift in identity appeared to entail an unraveling of certain aspects of their “traditional” anatomy selves including some of the terminology of classic anatomy, their areas of anatomical expertise, as well as their status of being well liked and popular amongst students. This loss was countered by the foregrounding of their role as educators in the course where a large part of their teaching is “bridging the gap” between students and the clinical expertise of collaborating physicians. In transitioning to an integrated curriculum participants are now in a context where they are teaching clinical content when they are not physicians themselves. This appeared to have an impact on their content credibility, or their “ownership” over the content they were teaching. Where the participants’ credibility in teaching anatomical content largely remained the same, some perceived a lack of credibility in terms of clinical content which seemed to contribute to feelings of uncertainty when teaching the clinical aspects of the course. Similar to how collaboration helped fill in areas where the basic scientists’ clinical knowledge may be lacking, collaboration also provided a sense of reassurance in terms of feeling credible enough to teach clinical content.

Lastly, this chapter concluded with Pratt’s General Model of Teaching (1998) which served as a framework to illustrate the four explanatory concepts in relation to the shift in teaching from before to after the transition to the integrated curriculum.

In the concluding chapter, the findings of the study, as described in Chapter 4, and the four explanatory concepts of this chapter will be considered in relation to a few underlying tensions that were not always explicit but a palpable undercurrent in participants’ telling of this story of integration. Additionally, implications of this research for the current state of integration in medical education as well as opportunities for further study will be explored.
Chapter 6 – CONCLUSION

Overview

This study described and interpreted a story of integration. It was not intended to be “the” story in terms of trying to portray an ideal example of what integration should look like, but rather allowed us to better understand what it is like for basic scientists to transition to and integrated curriculum. In an effort to convey the complexity of such a transition, in this concluding chapter I will first consider some underlying tensions that appeared to be threaded throughout the story. Second, I will discuss how the findings and explanatory concepts might be applied in the field of medical education in terms of both basic scientists who are anticipating changing to an integrated curriculum, as well as administrators or leaders involved in planning and implementation of such transitions. Third, I will comment on the strengths and limitations of this research. And lastly, I will suggest possible avenues for future research surrounding integration in medical education.

Underlying tensions

In this section I will discuss three underlying tensions stemming from the findings and discussion of this study including the tensions of beginner’s mind and continued learning, the tensions of junior vs. senior faculty, and tensions with students. I am mentioning these tensions not with the objective of providing solutions to how they may be addressed, but to bring to the surface some aspects of this particular story of integration that seemed to be unresolved and may be important for those who are approaching such transitions to consider.
Tensions of beginner’s mind and continual learning

The tensions of beginner’s mind and continual learning were alluded to at the end of Chapter 4 (Findings) with the description of how despite the physicians suggesting that some of the surgical cases were out of date and could perhaps use some revision, Paul and Galen held firm in the perspective that the cases were fine the way they were, as they still illustrated the anatomical concepts that needed to be taught. There appeared to be an interesting shift in both Galen and Paul’s perspectives regarding the intentions and goals of the cases from the time of developing the course, to nearly eight years after implementation. During initial planning Paul described how he said to physicians “I want cases that every student has to see. That’s the theory. You learn about it and then you have a clinical experience with it.” But when asked about the surgeons suggestions that the cases might now be out of date Paul’s response was that “we’re using the surgical procedure as a vehicle. We don’t care if it’s not done this way.” Similarly, Galen went from exclaiming that the vision of the course was to change to “teaching that was absolutely directed as what students needed to know” to later describing how in some cases they have to use cases that are not necessarily common because it is the only way to show the anatomy. I did not question, nor did Galen or Paul speak, about how they reconciled this shift, but their seeming change in perspective regarding the relevancy of the clinical cases may suggest that, several years after the implementation of an integrated curriculum, it may be more difficult to embrace the attitude of a “beginner’s mind” and to invest the time and energy in revising cases and once again having to learn the relevant clinical content from scratch. Alternatively, it is worth noting that Paul, after reading the analysis of this study, emphasized that “the intention of the course is to use common cases, not modern techniques”. Thus, this tension may instead stem from a misunderstanding between the physicians and basic scientists in terms of the goal behind using clinical cases to frame the course.
These examples are not intended to question the concept of beginner’s mind as an important part of what enabled these basic scientists to not merely weather, but actively lead the transition to an integrated anatomy course. Nor is it intended to raise doubts about their commitment to beginner’s mind as an approach to their professional life. However, it does suggest that beginner’s mind is not necessarily simple to adopt, hold or apply across time and across all potential learning tasks. For Galen and Paul, however, it was a powerful “call to arms” during the transition period, a touchstone concept that helped them to continue to maintain a positive orientation to change during a critical period of upheaval and personal/professional challenge.

**Tensions of junior vs. senior faculty**

A second tension underlying participants’ stories was the difference between junior and senior faculty with regard to the nature of faculty members’ feelings of uncertainty. Specifically, Jane, a junior faculty member, was anxious on several fronts, not only with the uncertainty of leading a clinically focused discussion by herself in seminars, but also with regard to teaching anatomical areas she had not previous studied in great detail. For more junior faculty the anxiety and uncertainty of transitioning to an integrated curriculum may not only be with respect to entering into a new clinical world but in learning how to embody the position of a faculty member for the first time. This distinction likely has important implications for supporting junior versus senior faculty in a transition to an integrated curriculum.

Interestingly, however, Jane’s junior status with regard to both her position as a faculty member and her experience with the integrated curriculum had positive implications for the issue of continual change in the clinical content of the course. That is, in talking about the tension between changing the course to be more relevant versus keeping the cases the same Jane said, “someone like me who’s, like, okay, I have to learn it all anyway, it doesn’t mean -- it doesn’t matter to me.
I will learn whatever they want to teach students.” This is likely the case for any new faculty member in any institution or program – clinically focused or not. Paul on the other hand spoke to the older generation of basic scientists in terms of dealing with change. He said, “things have changed. The idea of medical education has changed. What’s coming forward in 2014 is -- I think a lot of the older folks will be saying, ‘I’m glad I’m retiring.’ Because they just won’t deal with it. I’m not sure I can deal with it.” Paul is the one who championed and led this group of faculty through a dramatic transformative change in both curriculum and teaching. The fact that even he was in a state of questioning his capacity to deal with change nearing the end of his career brings to light how significant the stage of career individuals are in may impact willingness to invest the energy needed to learn the clinical content that is relevant today.

Tensions with students

Before the transition to the integrated curriculum, Galen and Paul described how they always got high ratings on evaluations and were well liked by students. Students were happy: the faculty delivered the information they needed to learn and they would reproduce that information on exams. Switching to the integrated curriculum meant that students now had to find information on their own in order to solve a clinical case or carry out a procedure. Faculty were no longer giving them all the content and students did not appear to be particularly happy about it. Paul explained, “trying to get students to view anatomy that way is a challenge. Getting students to buy in the method of learning, those were the challenges.” Students’ resistance to the integrated curriculum seems understandable as the framework of the course was a stark contrast to how they had been previously been enculturated to learn. Participants’ response in dealing with some push back from students seemed to vary. Jane and Galen quite regularly provided students with answers and learning tools rather than encouraging them to find and develop resources on their own. In contrast, Paul was very consistent in pushing students to be responsible for their own learning. This may be a
reflection of how Paul appeared to have come to terms with some students not “liking” him as indicated when he seemed to be fine with reading some student evaluations proclaiming that they hate it when he questions them and puts them on the spot instead of providing them with the answers. This may be a repercussion of Paul’s having attended the Harvard Macy program and engaging in a concentrated time to reflect and embody a new orientation to teaching. Importantly, this tension is likely exacerbated in current academic models, where teaching is purported to be valued by institutions, but is often operationalized as high teacher ratings. And this is likely especially true for junior faculty, whose promotion and tenure may be dependent on high teacher ratings. It is worth noting that although teacher ratings for the course have rebounded somewhat, they are, even eight years later, not as uniformly high as they were in the previous version of the curriculum. This tension, therefore, is one that teachers and administrators alike will have to be sensitive to not only during transitional periods, but well beyond the transition if the new curricular structure is a greater challenge for the students to adopt and engage with.

Implications

In this section I will suggest what implications the findings and explanatory concepts may have for both basic scientists who are anticipating a transition to an integrated curriculum, as well as administrators or leaders involved in planning and implementing such a change.

Implications for basic scientists

As I closed my time with each participant at Lillian Douglas I asked them what advice or recommendations they would give someone who, similar to them, has a background in basic science but is not a medical doctor, and who is about to transition to an integrated curriculum. I will start this section on implications for basic scientists by sharing each participant’s response to this question. Although
nearly everything participants shared about their experiences in some way speaks to the basic science community, the excerpts from this question in particular seemed to hold a salient message from Galen, Paul, and Jane to their basic science peers.

Again, in the context of each interview, my question to participants was, “What advice or recommendations would you give to someone who similar to yourself is a basic scientist with no clinical training and is about to make the transition to an integrated curriculum?” Paul responded,

*I would say lose all sense of shame. Be with people, you know, the clinicians that if you show interest, they will show interest. If you say, look, I’m trying to teach the course that you wish you had, and I don’t want to mislead my medical students. And, you know, can I shadow you? Can I discuss some ideas with you? And just take their-- whatever they-- even if you know it’s wrong, ‘cause a lot of clinicians will say something that’s anatomically wrong. Don’t worry about that, listen to how they use it, do it and you’ll come to figure it out. And the second thing is don’t worry that if the student doesn’t learn it from you that they’ll never learn it. If they don’t learn it from you and it’s important they’re going to pick it up somewhere, some place. And you just have to get used to that. So you do what you do, you do it well, you recognize the limitations of what you can do and you let it go. And have confidence that the rest of your faculty, I mean, in the whole school, that, you know, in the end they’re going to be doctors and they’re going to be doctors whether they do well in your course or not. So you may as well do something that’s going to be helpful for them, even if it’s not complete. And if you can get that kind of attitude, lots of things are possible.*

To the same question Galen answered,

*Well, I think you have-- first of all you have to have confidence in your ability to learn. And figure that you’re at least as smart as your students and, you know, and a colleague of mine in physiology said, well, you*
know, if you expect students to learn it, you should be able to learn it yourself. So the idea is it’s not like quantum physics. I mean, it’s something that you can actually master. And then to be willing to rely on people more than you would if you were teaching something that was much closer to your expertise.

Lastly, with regards to the advice she would give to someone with a basic science background who was about to make a similar transition Jane shared,

The thing is there’s no good way to do this. It’s just a lot of work … Don’t be-- don’t let your ego get in the way of asking for help because everybody has been very, very nice about it … It’s not actually as bad as it sounds. Because as long as you’ve got the anatomy I think the picking up of the clinical stuff is fairly straightforward. As I’ve said, I don’t know it with the depth that I would like. I have a very shallow understanding, but so far that has been good enough. That because we know the anatomy well enough our little bit-- our tiny little understanding of the clinic stuff is enough for these students.

The remainder of this section will differ slightly in tone from the prose of the rest of the dissertation as it resembles somewhat of list of suggestions for basic scientists to consider when undergoing change. Drawing from the findings and explanatory concepts of this study these suggestions or principles for change are things that may enable basic scientists’ transitions to an integrated curriculum. In terms of language, when I mention “you” I am referring to basic scientists who similar to myself as well as the participants in the study, teach basic science in a medical school but are not trained as physicians.

Be willing to let go

In transitioning to an integrated curriculum there will be things that you will have to let go of in terms of both your teaching and who you are as a basic science educator. The anatomists at Lillian Douglas had to let go of being the sole
decision makers in terms of content, aspects of their traditional anatomical language, areas of anatomical expertise, and to some extent their high ratings from students. They also had to leave behind some of their beliefs about teaching, in particular the idea that content needs to be formally covered in order for students to learn. As noted above, Paul suggests,

*don't worry that if the student doesn’t learn it from you that they’ll never learn it. If they don’t learn it from you and it’s important they’re going to pick it up somewhere, some place. And you just have to get used to that.*

Letting go of anything, let alone integral parts of your teaching practice and things that define your professional identity, will no doubt be a challenge. But remember that for the anatomists in this study the abandoning of old strategies and ideologies was at the service of adopting new practices and ways of thinking about teaching that would better serve their students’ needs.

*Adopt a “beginner’s mind”*

As stated by Suzuki, a beginner’s mind is “always ready for anything; it is open to everything. In the beginner’s mind there are many possibilities; in the experts mind there are few”(1970). Paul explained how this mindset of being open to many possibilities is what enabled him to make the transition towards a field that was not his own. The other participants also appeared to embody this mindset, at critical moments, in their willingness to start from scratch and their openness to try new things. Adopting a mindset of being open to new possibilities may help you let go of your previous conceptions of teaching as well as allow you to adapt and change with any immediate or ongoing curricular transitions your medical school may be undergoing.

*Collaborate*

Collaboration appeared to be essential for participants on two fronts: First in terms of learning the clinical aspects of the course, and second with regards to
learning a new strategy for teaching. Stepping out to make connections with the clinical faculty and seek their input was mentioned as one of the biggest challenges of transitioning to the new curriculum. But in facing that challenge and developing relationships with clinicians across the surgical specialties, the participants were able to establish integral and ongoing ties to the clinical world. At Lillian Douglas, the continued presence of physicians in the course not only provided an invaluable resource to ask clinical questions, but also gave some reassurance to basic scientists who felt they lacked credibility in teaching the clinical content of the course.

Collaboration was also a key aspect in learning a new strategy for teaching. Although the anatomists at Lillian Douglas were effective teachers to start with, their academic grounding was not in education. Thus, collaborating with a pedagogical expert helped them transition to a new way of teaching. In short, when delving into areas that are beyond your realm of expertise, whether in the clinical world in terms of integration or inquiring into a different approach to teaching, making connections with experts within such realms will greatly benefit your continued learning.

Be humble

In Chapter 4 (Findings) I described how part of the process of participants learning the clinical content of the integrated course appeared to involve adopting an attitude of humility. By humility I meant that the anatomists were willing to admit the limits of their clinical knowledge and to seek help from clinicians when they needed to. Paul’s advice is to, “lose all sense of shame.” Be bold, ask questions, and admit when you don’t know the answer. Not only will being humble help in terms of learning clinical concepts and terminology, but it will also help forge and strengthen collaboration and relationships between basic scientists and clinicians.
Be prepared to roll up your sleeves

No one ever said change was easy. In Jane’s words, “The thing is there’s no good way to do this. It’s just a lot of work.” Learning new material may require hours of extra study and preparation on top of your current schedule. But from the experiences of the participants this increase in workload appeared to predominantly be at the beginning of the transition. So be prepared to roll up your sleeves, but know that similar to any other course you have started from scratch it will involve extra work in the beginning and will likely taper off as the course progresses.

Face change alongside your colleagues and peers

For the anatomists at Lillian Douglas transitioning to an integrated curriculum was a challenge but it was not one that they had to face alone. Although it did involve individual work in terms of studying to learn the clinical content, when the integrated course was implemented the anatomy teaching faculty were all going through the change together. They met regularly, were open in sharing their struggles, and discussed how the challenges they were facing might be overcome. In coming to the course years after implementation, Jane was able to talk about her transition and how things were going with those who had already made the transition. Changing to an integrated curriculum at Lillian Douglas was far from a solitary activity, and having peers who were either going through the same thing or had already been through the change appeared to be valuable in helping them through the transition.

Take time to reflect

Like the complete reframing of the anatomy course at Lillian Douglas, transitioning to an integrated curriculum may involve a significant amount of change. Similar to Galen, Paul, and Jane such a change may put into question
your teaching orientation in terms of the beliefs you hold about learning and the role of a teacher, as well as your intentions or what you are trying to accomplish in relation to those beliefs. The reason Paul was able to fully embrace the new approach to teaching and Galen and Jane appeared to be at different places on the spectrum of change may have been a result of Paul having had the opportunity to critically reflect on his underlying beliefs about teaching and learning in the Harvard Macy program. During times of change when deep seated orientations are being challenged, taking the time to uproot and reflect on your underlying assumptions about learning and role of teachers appears to be a significant exercise to undergo. As Paul spoke about the importance of being in the education literature during his time at Harvard Macy, reading and informing yourself of whatever concepts are driving the change or undergirding the new curriculum may be helpful for understanding how they might impact your teaching orientation.

**Participate in decision-making**

As previously mentioned, studies in the field of organizational change have found that employees with greater opportunities to participate in decision making experience less stress and psychological strain during job transitions (Bordia, Hunt, et al., 2004). This literature implies that those who have a voice in the planning and implementation of an integrated curriculum will experience less anxiety throughout the transition. As a basic science educator volunteering to sit on planning committees and being proactive in terms of your participation in decisions surrounding the course(s) you teach may be important in terms of your well being throughout the transition.
Be prepared for changes in your role and sense of self

Paul mentioned that in making the transition to the integrated curriculum the biggest challenge the anatomy-faculty had to face was a “sense of identity”. He said dealing with issues of identity was a struggle:

because people have their-- so much of their identity wrapped up in their teaching. And so what we’re basically saying is, what you’ve been doing for the past 35 years is all wrong and here’s the right way, right. Where 35 years ago the way they were teaching them might have been just fine for the context of 35 years ago. But things have changed. The idea of medical education has changed.

In transitioning to an integrated curriculum expect to be thrown into a transitory state in terms of your academic identity. If you are asked to teach within a different pedagogical framework, the way you taught your discipline and what you wanted students to learn may be put into question. As it was for the anatomists at Lillian Douglas this will likely be a challenge. Although you may have to leave aspects of your teaching behind, you will likely begin to form a new role and identity within the integrate curriculum. At Lillian Douglas the role of basic scientists in the integrated curriculum appeared to be mainly as educators who helped bridge the gap between students and the clinical world. How basic scientists roles are re-defined in transitioning to an integrated curriculum will likely vary depending on the context of the school and what other health professionals are involved in the course.

Manage the uncertainty of teaching a profession that is not your own

In addition to potentially having to take on a new role and identity, as basic scientists transitioning to an integrated curriculum you will likely have to negotiate the fact that you are teaching clinical content when you are not a physician. Similar to Galen, this may involve feeling unqualified to teach certain content, but having to teach it anyway. As described early in the section on collaboration,
Galen’s words of being “willing to rely on people more than you would if you were teaching something that was much closer to your expertise” may be helpful in dealing with this in that collaborating and continually communicating with clinicians will not only help build confidence that the content you are teaching in relevant, but may also give you more assurance in teaching it. Keeping in mind the broader community of educators involved in training students at your medical school may also help ease any tension with respect to teaching clinical content when you’re not an MD. As advised by Paul, “have confidence that the rest of your faculty, I mean, in the whole school, that, you know, in the end they’re going to be doctors … So you may as well do something that’s going to be helpful for them, even if it’s not complete.”

**Anticipate continual change**

As a body of knowledge, anatomy, for the most, part stays fairly stable. The clinical world however undergoes continual change, with research and technology continually shifting how patients are assessed and treated. If your goal is to teach anatomy in a way that students will see it when they get to teaching hospitals, recognize that the context of medicine is ever changing and that the clinical content of your course may need to adjust accordingly. This concept of being prepared for continual change can also be applied to advances in teaching and pedagogy. The advancement of technology and availability of information via the internet has vastly changed teaching and learning at all levels of education. So not only will it be important to be mindful of how your course may need to adjust to changes in medicine, being in tune with advancements in teaching and learning may also be important for understanding how to best serve your students education.
Consider your students

Keep in mind your students are training to be doctors – not anatomists. As such what they need to know in terms of anatomical knowledge is likely different than the anatomical knowledge you have learned and acquired as an anatomy educator. Meeting your students’ needs will most likely not be the easiest path for you in terms of teaching. For the anatomists at Lillian Douglas this meant collaborating with clinicians, finding out what students needed to know, letting go of certain content areas, and restructuring the course with students’ needs in mind. It most likely would have been much easier for them to continue delivering large amounts of anatomical detail but they came to the realization that the volume of content they were delivering, and the teaching strategies they were using, did not align with their students’ best interests as future physicians.

Be ok with not being “liked”

Despite the student centered focus of the integrated anatomy course being in students’ best interests, the students themselves did not initially recognize that it was for their benefit that they were being challenged to be more self-directed rather than being the recipients of information. As such, in transitioning to teaching strategies that may go against students’ previous enculturation of memorizing information to reproduce on a test, expect some initial push-back from some students in terms of them not liking the “discomfort” of a new framework for learning. It may be helpful to be very explicit at the beginning of the course by explaining your instructional strategy and your belief that it will serve them better in their future careers as doctors.

Implications for those planning and implementing integrated curricula

Using the same format as the previous section of listing suggestions or principles for change, in this section I will turn to what administrators or those leading
change efforts might take from the experiences of basic scientists transitioning to an integrated curriculum. You will note how a few points parallel those mentioned with respect to the implications for basic scientists. Although suggestions or principles for change may be similar, this section will speak to those points with the interests of leaders of change in mind. In terms of language, the “you” in this section refers to administrators or leaders whose role is to plan, lead, and/or implement an integrated curriculum.

Consider faculty participation in decision-making

As mentioned in Chapter 5 (Discussion) control plays a significant role in helping with the stress and psychological strain of job-related transitions (Ashford, 1988; Bordia, Hobman, et al., 2004), especially with respect to individuals’ ability to participate in making decisions throughout the process of change. For those charged with planning and implementing change, allowing individual educators to participate in decisions surrounding the curriculum may greatly enable the transitions they will have to make. Strategies for change often come from high level planning committees. As such, when individual educators or clinicians are finally brought into the decision making process it may appear to them that they are affirming a decision already made rather than being a part of the “actual” decision making. Of course, there is a trade-off between wanting to include everyone in developing a new curriculum and the efficiency of a select few making the decisions. In this study the basic scientists’ control over developing and implementing the integrated curriculum appeared to largely facilitate their transition to teaching within the framework of clinical cases. As such, considering ways basic scientists can participate in decision making and implementation may be important to help facilitate successful transitions to integrated curricula, especially with respect to the course(s) they are involved in teaching.
Facilitate collaboration

Do not assume that if time and space is created for basic scientists and clinicians to come together that collaboration will necessarily occur. When the basic scientists at Lillian Douglas approached clinicians to try and get them involved with the integrated anatomy course they were not alone. They had the support of the dean who attended every meeting with Galen and Paul across the surgical specialties in order to persuade physicians to volunteer their expertise and time to the course. Imagine how empowered Galen and Paul must have felt to have the dean take the time to attend each meeting making it clear to the clinical faculty that he supported their venture of the integrated anatomy course. I am not implying that transitions to integrated curricula must involve the dean in this way, but if not the dean, what might be the equivalent level of support be at your institution? As collaboration was a key element for enabling the transition at Lillian Douglas, helping to facilitate the connection between basic scientists and clinicians may be an important factor in making change possible. At Lillian Douglas the power and influence of the dean played a part in encouraging physicians to participate. You may not need such external motivation in the context of your medical school, but being mindful of the importance of establishing connections and facilitating collaboration between basic scientists and clinicians may be an essential, if not one of the most important aspects, of the success of an integrated course.

Bring in the experts

The transition to an integrated curriculum at Lillian Douglas involved not only collaboration between basic scientists and clinicians, but also collaboration with experts in teaching and change management. In wanting to frame the anatomy course with clinical cases the basic scientists sought the help of physicians – those with clinical expertise. In terms of transitioning to new teaching strategies they sought out a pedagogical expert – Kyle, who had expertise in teaching and
learning. Kyle was also an expert in helping (potentially resistant) groups of individuals deal with change. Whatever areas of expertise your new curriculum may entail, recognizing the need for collaborating with experts beyond the field of medicine may be an important part of facilitating the transition. This may be particularly important in terms of change management, as having a "neutral" person from outside the medical school like Kyle appeared to make it easier for participants to talk about the challenges and struggles of transitioning to a new curriculum.

*Consider more appropriate markers of effective teaching for promotion*

As previously mentioned an immediate and ongoing repercussion of the integrated curriculum was push back from students. Student evaluations of the course were initially lower as students were confronted with a way of teaching and learning that contrasted with their previous schooling experiences. Although student evaluations did improve in later iterations of the course, it may be important for administrators to appreciate that teaching in a way that is praised by students does not necessarily equate to effective teaching. Recognizing faculty members' willingness to engage in educational innovation rather than being “liked” by students may be a more meaningful marker of success in terms of promotion and will encourage faculty to participate in change efforts rather than resorting to teaching that appeases students.

*Create the time and space for change*

Developing and designing an integrated curriculum is a lot of work. Not only to put together courses or cases but to be able to engage and reflect with other faculty about the changes that are going on. This is in addition to the already full teaching or clinical loads that basic science and clinical faculty are responsible for. As administrators, somehow carving out the time for extra planning, collaboration, reflection, and innovation may encourage faculty to participate in
change efforts by making them more manageable within their timetables. And as with teaching, finding meaningful valuation for this work at promotion will be important to maintain the energy and enthusiasm for the activity.

Harness the “water cooler” conversations

This point comes from both the experiences of participants at Lillian Douglas as well as my own experience teaching in the context of a medical school that is anticipating transitioning to an integrated curriculum. Inevitably in times of change there is much conversation amidst colleagues surrounding the uncertainty of what is going on, as well as aspects of the new curriculum faculty may dislike. As Paul did when planning the change to the integrated curriculum at Lillian Douglas, my suggestion is to harness these “water cooler” conversations by creating a formal space for faculty to reflect, discuss, and hash out the struggles they are having in making the transition. Developing such a space where faculty feel comfortable enough to share their difficulties may not be easy, and as suggested in the previous point inviting in an expert in change management may be helpful. Meeting in a group setting may not only allow faculty to see that they are not alone in their struggles, but may also enable them to perceive the challenges they might be facing as opportunities for learning as well as help them develop a game plan for how they might address them.

Strengths and limitations

The strengths of this study might also be categorized as limitations. For example, one strength was the study’s focus on a particular group of anatomists that had successfully transitioned to an integrated curriculum. As few have reported successfully making such a change, honing in on this specific group of anatomists was a benefit in that we were able to hear the experiences of individuals within this rare example of integration gone well. Another strength related to focusing on the “particular” was in the small number of participants. As
discussed in Chapter 3 (Methods) having only nine total participants, and three primary participants within that nine, allowed me to inquire into the depth and detail of participants experiences. The richness attained by studying a particular context with fewer participants is a strength of the study in that it brings life to the structural curricular models we in medical education are accustomed to seeing in the literature. On the other hand, my choice to dig into the details of the experiences of a particular group of anatomists could also be considered a limitation. It was a limitation firstly in that the data were “messy”. The data overflowed with complexity, subtleties, and subplots that fit only reluctantly into neat categorized boxes and diagrams. Secondly, in selecting a single case study the findings are not “generalizable” in the sense of being able to extrapolate them to a larger statistical population. Although the findings may be considered “transferable” in that they could be applied to a similar context (Y. Lincoln & Guba, 1985), I prefer Merriam’s term of “user generalizability” where people reading this dissertation can decide for themselves whether the findings can be applied to their situation (Merriam, 2009).

In terms of limitations, if there was one thing I could have changed about the design of this study it would have been to have others involved in the coding of transcripts. As described in Chapter 3 (Methods) data analysis occurred throughout the process of data collection with the reading of field notes and interview transcripts, and continued after I left the field with iterative coding and writing. My two PhD supervisors were involved in data analysis to the extent that they reviewed field notes and transcripts early on when I was in the field as well as providing feedback on my continued writing. The stage of analysis that included the coding of data and selecting which codes to foreground was done on my own. Although I am confident that I did a thorough and thoughtful job of coding the data, as an early career researcher I would have had more reassurance in the codes I selected and chose to foreground if I had confirmation from someone who had also scrutinized the text line by line.
Future research

This study was focused on the anatomy faculty of a single medical school. As more and more schools implement integrated curricula it may be helpful to inquire how the role and identity of basic science educators have been reshaped as a result of teaching within a clinical framework. In addition, this study sought to understand the experience of anatomists who had already made the transition to an integrated curriculum. Inquiring into the experiences of basic scientists who are anticipating change and who are in the midst of change will allow us to understand in greater detail how to support educators who are at different points along the process of reform. Lastly, using the findings of this study as a resource for inquiring into what specific structural and systemic changes need to occur in order to help support basic scientists through times of change may also be beneficial in terms of future research.

Summary

This study was not designed to determine the “correct” or “ideal” way to go about integration, but to understand what it is like for basic scientists to transition to a curriculum that embeds the teaching of their discipline in the context of clinical practice. From the experience of the anatomists at Lillian Douglas School of Medicine I discovered that transitioning to an integrated curriculum is a complex and multifaceted process. It involves letting go of old teaching practices and assuming the attitude and posture of a humble beginner in taking on the learning of a new clinical perspective. I would venture to say that the development, implementation and continued functioning of an integrated curriculum would be very hard, if not impossible, without collaboration between basic scientists and physicians. Collaboration with experts in pedagogy and change management also appears to be vital as faculty are faced with the questioning of their underlying beliefs and orientation as a teachers as well as rediscovering what their role and identity is within the context of the new curriculum. In recognizing
the difficulty of both letting go and recalibrating one’s beliefs and identity as a teacher, this research brings light to areas where administrators or other levels of change might support basic scientists through such transitions. Whether you are planning, developing, or are in the midst of implementing an integrated curriculum, being mindful of what individual faculty are confronted with in times of change, and considering how the different levels of change may work to support them will be important in helping make change a reality.


Appendix – Consent form

CONSENT FORM
Curricular Integration: Anatomy educator’s experience of change

Principal Investigator: Dr. Daniel Pratt, Department of Educational Studies
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What this study is about:
The aim of this study is to understand anatomy educators’ experiences of transitioning to teaching within an integrated curriculum. The research team is interested in learning about how these transitions have influenced anatomists teaching within the medical program. As many health professional programs are either making or anticipating changes towards integrated curricula there is a need to understand what this means for teachers, particularly basic scientists, within health professions education.

Why you have been asked to participate:
You have received this invitation to participate because you are either part of the anatomy teaching faculty at the Yale School of Medicine (YSM) or played an integral role during the implementation of the clinically engaged anatomy program. YSM’s anatomy program has been identified by the research team as one that has successfully transitioned to an integrated curriculum.

Study Procedures:
A member of the research team (Robin Hopkins) will visit the anatomy program at YSM from October 15th-November 16th, 2012. Her role during that time will be as an observer of the program, attending all labs, lectures, workshops and meetings relevant to the clinically engaged anatomy program. Apart from observing the ongoing context and daily activities of the program, she will also conduct interviews with members of the teaching faculty. Interviews will be
broken up into two one-hour sessions. Interviews will be audio recorded and transcribed. A report of the findings of this study will be sent to you for your review and comment upon completion of the study.

**Potential Risks:**
There are no risks to this study apart from any potential adverse feelings you may experience having an observer within your classroom or lab. Your teaching is not being evaluated in any way.

**Confidentiality:**
Your identity will be kept strictly confidential. Pseudonyms will be used throughout all field notes and interview transcripts. Data will be saved on a password protected area of the server at UBC. This research is for a doctoral degree and will be part of a thesis which is a public document. However, participants will not be identified by name in any reports of the completed study.

**Contact for information about the study:**
If you have any questions or desire further information with respect to this study, you may contact Robin Hopkins at robin.hopkins@ubc.ca.

**Contact for concerns about the rights of research subjects:**
If you have any concerns about your treatment or rights as a research subject, you may contact the Research Subject Information Line in the UBC Office of Research Services at 604-822-8598 or if long distance e-mail to RSIL@ors.ubc.ca.

**Consent:**
Your participation in this study is entirely voluntary and you may refuse to participate or withdraw from the study prior to data analysis.

Your signature below indicates that you have received a copy of this consent form for your own records.

Your signature indicates that you consent to participate in this study.

________________________________________________________________________________________________________

Printed Name

________________________________________________________________________________________________________

Subject Signature                                           Date