NAVIGATING THE COMPLEXITIES IN TEACHING:
EXPLORING THE THINKING PROCESSES THAT TRIGGER AND SUSTAIN TEACHER DEVELOPMENT

A Synthesis Project Presented

by

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ABSTRACT

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May 2010

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Directed by Professor Carol L. Smith

As a student in the Critical and Creative Thinking Program I have learned about ways of thinking that have greatly impacted how I teach my high school students as well as how I think about my own teaching. Over the past year I have sought out teachers to interview to help me expand my understanding about how teachers make thoughtful decisions given the complex realities they face. Through analyzing these teachers' reflections on their thoughts and experiences I have discovered ways of opening my own thinking as well as patterns in productive teacher thinking that could help many other teachers grow and improve.

This paper explores how teachers think about their experiences through the lens of adaptive expertise and problem solving. It describes how these teachers think through three complex, and related, areas of teaching: instructional choices, trying new ideas and taking classroom risks. The narratives from these teachers provide the reader with examples of both questions these teachers used to think through their choices, as well as real classroom examples of the mistakes and successes teachers had as a result of these choices. These teachers' descriptions of their work are not meant to provide a model of how to run a classroom, but instead to provide several models of how educators have navigated the complexities of teaching.

DEDICATION

This work is dedicated to thoughtful colleagues who have pushed me to be a better teacher

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ACKNOWLEDGEMENTS

Thank you to the seven teachers I interviewed for their time and willingness to share

Thank you to my classmates in the Critical and Creative Thinking program who have always given me insight and have also encouraged me along the way

Thank you to my advisor and reader for their time and infinite patience

Thank you to my husband and son for giving me the time and encouragement to complete this work

CHAPTER 1

INTRODUCTION: THINKING LIKE A TEACHER

One August day, during the summer before my fifth year of teaching, I went over to my friend Cathy's house for lunch. While we wanted to meet anyway to chat, we had an ulterior motive, as most of my teacher-friends do – we wanted to share ideas for the upcoming school year. Cathy and I agree on many things, but we each approach teaching with a critical difference in perspective; Cathy is idealistic, dreamy and imagines her ideal classroom when she plans her year. I, on the other hand, am more of a pragmatist who focuses on how plans will work with the often flawed reality I face.

That day Cathy was thinking about ideas and books that have inspired her, and I was looking at the state standards for 10th grade English. So, when we met, it was difficult at first to figure out where the conversation was going since we were beginning with dramatically different perspectives. Cathy started by mentioning a book she read which suggested coming up with one hundred questions "you" (the reader) wanted to answer. She immediately started doing this while I sat next to her, confused about how this related to the state standards I had so diligently read and analyzed. However, her enthusiasm pushed me to start my own list of questions, all the while picturing how my students might complete the same exercise. After writing our questions I brought up the idea of planning a mini-unit on questioning as an essential skill that students need. This idea was exciting to me because it was a concrete task with a clear end-product – exactly the type of project I like to tackle. However, this was not such an easy transition for Cathy, though she still decided to try and follow me on the shift I was making in our work. After a bit of nudging on my part, Cathy and I both started thinking about what such a unit would accomplish. This turned our conversation to what the root purpose of the questioning exercise was: to get students to be more aware of their thinking and to be metacogntive

about how they build knowledge for themselves. This revelation, in turn, led to a discussion of what it meant for our students to be "lifelong learners." At this point, Cathy and I both enthusiastically started brainstorming what it meant to be a lifelong learner for us as adults and started considering how those expectations would look both the same and different for the teenagers we would be teaching.

We did finally end up with a list of expectations for our students driven by our understanding of how "life-long learners" read, write and think. However, the important lesson I draw from this brief anecdote has less to with what Cathy and I produced and more to do with the process we went through. The value from this experience was the way that Cathy and I both developed more nuanced ideas for our instruction and our own thinking about our classrooms through our interaction with each other. Upon reflection about this moment of collaboration I pondered the question: What do Cathy and I represent? In some ways we are opposites: a dreamer and a realist. However, our differences are more complex than that. Cathy and I both embody qualities that a teacher needs to thrive. Cathy sees the ideal classroom more clearly than I do, whereas I find myself focused on the often-flawed reality in front of me. From these opposite perspectives our conversations helped to provide us both with the fresh perspective we need. Cathy reminded me of that, like Plato's shadows, an ideal classroom exists, even if we will never see it. Similarly, I pushed Cathy to consider the slightly less glamorous details of day-to-day teaching. We both needed the other to help us find a balance of perspectives rather than getting stuck in one way of thinking.

When I consider this one snapshot of one day in my teaching career, I am struck by all the complexity within it. Cathy and I approached our planning from different perspectives, only to come to a conclusion that is worth more than the sum of our individual ideas. We are also grappling with some difficult problems inherent in teaching: What do students really need to know? How can we teach students to think? How can we make students aware of their thinking? These are all complex problems that have no easy solution. The bottom line is that teaching is complicated. None of this is

news to educators, or probably even to most of the general population. However, there are millions of teachers who get up every day, go to work, and perform this task we call teaching, regardless, or perhaps because of, the complexities inherent in the work.

Within the current political climate around education reform and Race to the Top funds focused on the idea of teacher quality, many in the education world, especially educational policymakers, are struggling to name and evaluate strong teaching. While I have not seen a clear consensus among educators about what distinguishes an expert teacher from a "good" teacher, or a teacher that has simply been teaching for a long period of time, it seems that an exploration of how teachers move along the novice/expert spectrum might lead us to an understanding of what distinguishes an expert teacher from a novice teacher, or even competent beginner. In some ways this seems like a backwards process – surely we must know who the experts are to see how they distinguish themselves from others in their field! However, in the process of exploring how various teachers learn and develop, we can analyze the similarities and differences in their thinking and processing methods which can allow us to better understand the thinking behind expert teaching, or, at the very least, the potential to become an expert teacher. Reading and reflecting on this analysis can also possibly help mid-level teachers more thoughtfully and effectively move towards expert teacher status.

As an educator I have made my greatest intellectual leaps when another teacher has made his/her thinking transparent to me. By emulating the thinking processes of teachers I respect I have learned and developed and improved my own teaching practice. Another thing that I have found in my own practice as a teacher is that much of my growth and improvement as a teacher has stemmed from my ability to better understand and grapple with what seems to be either-or choices, such as the struggle Cathy and I faced when trying to start planning from the perspective of open questioning or state standards. While we could have chosen one way, our discussion and final product was richer after we explored the space between these different potential starting points. In fact, it has been the space

between those choices that has led to a deeper understanding of my content, my pedagogy, and my instructional practices. Parker J. Palmer, a scholar who has written extensively about teaching, describes the potential pitfalls of either-or thinking when he explains that "either-or thinking has also given us a fragmented sense of reality that destroys the wholeness and wonder of life. Our problem is compounded by the fact that this mode of knowing has become normative in nearly every area, even though it betrays us when applied to the perennial problems of being human that lie beyond the reach of logic" (Parker, 1998 p. 62). While there are problems in teaching that are simpler than others and some have only one clear solution, many of the realities of being a teacher are much better described as complex problems. Teaching can be seen as an art, as a science, or as some hybrid of the two. Teaching requires patience along with a sense of urgency, being a good listener and a good speaker, being both authentic and a performer simultaneously. Being a teacher means embodying many different roles at different times. This reality is difficult to manage and balance for teachers at any level, and being stuck in an either-or mentality can be extremely detrimental and even stunt a teacher's professional growth and ability to navigate the complexities they face.

As I have moved through the Critical and Creative Thinking Program at the University of Massachusetts/Boston, I have gotten more and more interested in how teachers think through the many complex issues they face on a daily basis, especially when they face outside pressure to chose between seemingly limited choices, such as direct instruction vs. inquiry, or phonics vs. "whole-language." Although I have always seen the thoughtful teachers I knew as "good" thinkers, I wanted to know more about what their thinking really looks like. I wanted to see what type of thinking processes these teachers share and how they differ as well. How do these teachers move away from either/or thinking? What thinking processes do they use, and how does their thinking about the complexities of teaching impact their instruction? It is clear to me that teachers, such as myself, are able to grow and develop teaching expertise through more than traditional professional development workshops or shared

planning time with colleagues. Although these do contribute to teacher growth I have developed the most when I take the time to think through my choices and then share my ideas with thoughtful colleagues. However, I have seen teachers who engage in both collegial conversations and professional development opportunities and still do not seem to improve, while others I know are able to take these interactions and turn them into lessons, systems and tools that help them grow and thrive in the classrooms. I embarked on this project to try to discover some of the thinking processes that thoughtful teachers engage in to foster their growth and development. I am curious about whether there are thinking processes that these teachers all share that are productive, and also in the ways these teachers might differ from one another.

Methods: Using Interviews to Uncover Teacher Thinking

In order to answer my questions about teachers' thought processes, I interviewed six different teachers, although the interviews I conducted for this investigation are better termed informal discussions. I started this project by requesting interviews from teachers I knew, and also teachers I made contact with through friends and colleagues. These interviews were limited to teachers whom I understood to be thoughtful. For my purposes, I define a "thoughtful" teacher here as one who uses a variety of information to inform his or her instruction, from student assessment, to state requirements, to student interest, etc. For each interview I provided the teacher with a letter of introduction and a list of questions I could ask (appendix A). The teacher and I sat down and I started off by asking each one how he or she had developed as a teacher. From that point on I let each one talk, and often asked follow up questions based on the teacher's responses, which of course varied from teacher to teacher. In only one of my six interviews did we get through all six questions. I took copious notes for all the the discussions, and referred back to these notes often. I was also able to record audio for two of the discussions and contacted several of the teachers a second time to clarify some points before writing.

My goal in these interviews was to get some insight into the thinking processes of these teachers,

as well as to better understand how their thinking had developed over time. Often my follow-up questions asked for more specific examples, or asked what led them to a thought, idea or action they had taken. Also, during the interviews I was not an objective observer. My body language often expressed both agreement and empathy, though I tried to stay away from negative responses.

While my methods of giving and analyzing the interviews were informal and do not meet the standards of a scientific study, these interviews have certainly provided me insight into my own thinking. I hope that both the examples from these teachers, as well as my reflections on my teaching and these interviews, will provide models for other teachers of the kinds of thinking processes that can help them grow and develop as teachers and reflective practitioners.

However, before delving into the interviews, it is important to explain the concepts that can help me frame a discussion about the thinking processes of teachers. Therefore, the next chapter focuses on some prior work on the development of adaptive expertise, and related thinking processes, in order to set the stage for the presentation of the teacher interviews in Chapters 3-5. Chapters 3-5 present teacher thinking about three kinds of dilemmas of teaching. Finally, in Chapter 6, I consider not only what I have learned from these interviews that informs my own teaching but also suggest ideas for future research and exploration into teacher thinking and development.

CHAPTER 2

THE DEVELOPMENT OF TEACHER THINKING

Starting Big: Teachers as Adaptive Experts

In my process of investigating teacher development, both my own and that of other teachers, I have found it useful view this development through the lens of expertise. Surprisingly, my searches have not found much research specifically about the development of teacher expertise. However, my own teaching experience as well as an understanding of expertise leads me to think that teachers' development of the ability to think like an expert in regards to teaching is connected to their improvement as educators. Also, many of the teachers who are consciously attempting to improve themselves are what we might call "adaptive experts." As J. Bransford summarizes "adaptive experts are able to approach new situations flexibly and to learn through their lifetimes. They not only use what they have learned, they are metacognitive and continually *question their current level of expertise* and attempt to move beyond it. They don't simply attempt to do the same things more efficiently; *they attempt to do things better*" (Bransford, Brown, & Cocking, 2000, p. 48 emphasis added). This description fits all of the teachers I interviewed, as well as many of the teachers I know personally. What I hope to learn from a deeper analysis of the interviews is *how* these teachers use their experience to think through these experiences in their quest for self-improvement. It is through the discovery of how teachers enact this thinking that I, and other educators like me, can develop our own effective thinking habits for ourselves.

In their paper "Expert Performance: Its Structure and Acquisition," Ericsson and Charness propose an approach to studying experts that can be used as a lens through which to analyze the results of my interviews. What these researchers wanted to find was the specific cognitive processes that

experts used to become superior in their domains. What they found were some important commonalities that experts exhibited across domains. These included the need for experts to gain a vast amount of domain-specific knowledge, often through specialization in a specific aspect of that domain, especially as the amount of knowledge and information has increased over time, the need for "several thousand hours of practice," and the need for what the author's term "deliberate practice" which Ericsson and Charness explain by stating "to receive maximal benefit from feedback, individuals have to monitor their training with full concentration, which is effortful . . ." (Ericsson & Charness, 1994, p. 737-738). Essentially, the commonalities between experts were that they had gained vast amounts of knowledge in their domain, and had spent significant amounts of time performing focused, deliberate practice in their field. The final common piece these authors present is similar to Bransford's definition of adaptive expertise. Ericsson and Charness describe the phase in which an expert must go "beyond the available knowledge in the domain to produce a unique contribution to the domain" (p. 740). Essentially, part of being an expert means developing new and novel ideas and contributions, not simply having a vast library of knowledge, though the ability to store and apply knowledge from experience is crucial for experts.

While factors in expert development gave me a lens through which to view teacher development, I wanted to know more specifically how experts store knowledge and see if that was similar to the way the teachers I interviewed were storing knowledge as well. J. Bransford, A. Brown and R. Cocking, in a chapter entitled "How Experts Differ from Novices," provide a slightly more concrete explanation of how experts store and use knowledge. They discuss how experts in many fields both gain and are able to easily recall and use domain-specific information because of the cognitive framework they use to organize this knowledge. As these authors state "[Experts'] knowledge is not simply a list of facts and formulas that are relevant to their domain; instead, their knowledge is organized around core concepts or "big ideas" that guide their thinking about their

domains" (Bransford et al.,, 2000, p. 36). These "big ideas" or core concepts are how experts organize their knowledge, and also facilitate a more authentic and fluent retrieval of that information.

We can see how this use of the "big idea" framework functions in one of the examples Bransford and his colleagues provide, which is also one of the few examples of an analysis of teacher expertise. In this example they share a report where expert teachers and novice teachers viewed the same classroom video. When asked to explain what they noticed in the video experts said things such as "On the left monitor, the students' note taking indicates that they have seen sheets like this and have had presentations like this before; it's fairly efficient at this point because they're used to the format they're using" while the novices say things like ". . . I can't tell what they are doing. They're getting ready for class, but I can't tell what they're doing" (Bransford et al., 2000, p. 37). The contrast between these two examples as well as the they provide, illuminate both how experts organize information based on deeper conceptual understandings and how experts are also adaptive and constantly looking for ways to grow and improve. What makes the expert teachers stand out here is not just that they are noticing more, but that they are looking for information about how students are interacting with the whole instructional picture, while the novices seem more focused on surface level and short-term student actions (such as generically "getting ready for class"). The expert teachers also explain what they see in a way that could lead to adapting and improving instruction. One expert teacher comments "I don't understand why the students can't be finding out this information on their own rather than listening to someone tell them . . ." (p. 37). This comment suggests that the expert teacher is both noticing important information organized around student interaction with instruction as well as considering how to develop better instruction. These examples show all of the cognitive mechanisms of experts in place. The expert teachers have a large amount of knowledge and experience to access (built, one assumes, after years of deliberate practice), have the ability to access this knowledge through the "big idea" of organizing information based on student interaction with instruction, and,

finally, these expert teachers show the traits of being adaptive experts because they are not simply looking for the fastest way to get information to students but are instead looking for better ways to enhance student learning. In this way we see how expert teachers demonstrate some of the key cognitive processes of experts in other domains.

Focusing In: Cognitive Structures for Developing Solutions to Complex Problems

As illuminating as the previous example is, it is one of the only examples I have found where a cognitive perspective of expertise has been applied to teachers. After learning about some of the foundational ideas regarding expertise, but also noticing the lack of examples from teaching, I became interested in how these concepts could apply to my own ideas and observations of the thinking done by teachers. In my time as a teacher, I have spent a lot of time in thoughtful conversations with colleagues, as well as a fair amount of time analyzing my own classroom experiences. One thing that has always impressed me about the strong teachers I know is their ability to actively consider the concrete realities around them, such as curriculum requirements and immediate student needs, while simultaneously understanding the deeper factors embedded in these realities, such as the purpose behind textbook standards and the way a student's behavior may be influenced by factors outside of school. Additionally, the best teachers I have known have also been able to imagine how these realities can be transformed into something better, often in ways that seemed unique and novel to me. The earlier example of Cathy's and my development of "life-long learning goals" is an example of how teachers can take simple ideas and develop creative solutions. This is a deeply creative process, and is also an indicator of these teachers behaving as "adaptive experts."

I have always wondered what specific types of thinking structures would allow these teachers to develop the novel ideas that so impressed me, and how I could apply those structures to my own thinking. In his book *Creativity in Education and Learning* Arthur Cropley, a professor of psychology

who has written extensively on creativity and teaching, identifies several ways that psychologists have described the cognitive structures that lead to creative outcomes. Of these, the one that best speaks to what I have observed in teachers' thinking is Robbie Case's description of three types of schemata. Case identified three types of schemata that must interact for creative thought to develop. As explained by Cropley, " '[F]igural' schemata yield a concrete internal representation of information, 'operational' schemata identify the general aspects of the information and 'executive' schemata lead to transformations of data. [Case] saw creativity as occurring when figural schemata are applied to yield accurate structures, operational schemata identify their abstract properties and executive schemata are *flexible, complex and differentiated and lead to novel transformations*" (Cropley, 2001, p. 31, emphasis added). What is so compelling about this analysis is that is recognizes the different types of knowledge that must be in place for creativity to occur. While Case was focused on development in other domains, his analysis of the interactions among three types of schemata could easily apply to teachers who must start by understanding the basic concrete reality in front of them, and then, through experience, be able to understand more abstract ideas and use this knowledge to develop creative solutions to problems. These schemata help explain how the development of expertise is connected to the use of domain specific knowledge and executive schemata in problem solving that teachers engage in on a routine basis.

As discussed previously, part of the development of expertise involves a person developing the ability to organize information around the big ideas that allow one to see larger and deeper conceptual connections such as seeing a classroom through the lens of student interaction with instruction rather than more surface level similarities such as focusing simply on teacher action. Experts are able to develop these deeper conceptual connections in part because of the development of knowledge and depth of experience in their field. However, as they develop the ability to sort information on a deeper level and more fluently apply that information they are also developing the ability to move fluently and

effectively through a problem space, using the types of schemata described by Case. In the case of teachers, once they have a figural schemata in which to easily understand concrete information, and an operational schemata that allows them to see the abstract aspects of that information, they are able to use the executive schemata to transform that information into not only novel ideas and applications, but also to make effective and interesting connections between ideas that may not seem connected on the surface. As they apply these connections and ideas they gain more experience that adds to the store of knowledge in the "adaptive expert" cognitive framework. This ability is crucial for teachers to not only develop their instruction, but also to continue to grow as they encounter new situations that require this type of critical and creative thought.

The earlier vignette provides a helpful example of Case's three schemata at work as Cathy and I attempted to problem-solve around our goals for the following school year. Both Cathy and I are experienced enough as teachers to have a way to both recognize and easily access concrete information. In my case, this information was the state standards, and in Cathy's it was information from the book she read. Also, since neither Cathy nor I is a true beginner, we had the ability to recognize the more abstract aspects of that information and sort it according to our more developed conceptual map. This is apparent when we both start the questioning exercise and arrive at the goal of developing a questioning unit. Rather than focusing on our individual teacher actions we were focused on how our students could interact with our instruction in a way that would allow true learning to occur. Teaching the state standards and engaging in Cathy's questioning activity may seem like opposite actions on the surface, but in reality they have similar aims – to get students to develop the crucial knowledge and skills they need. Cathy and I are both able to recognize that the thinking skills inherent in the questioning are related to *students'* ability to learn and develop in accordance with the state standards. Our ability to organize the information we had around authentic student learning shows part of our development along the novice-expert spectrum, in the sense that we are organizing information on a

deeper conceptual level than a true novice might. For example, a first-year teacher in our same situation may have focused more on what he/she would have to say and do during the first day of school, rather than starting from a point of what she/he expected students to learn. Although Cathy and I certainly are not full experts or perfect teachers, we were at least able to begin from a point of student learning and see it in the abstract, which allowed us to move towards more creative and open thinking.

However, the next leap is where both the executive schemata and the use of creative thinking really come into play. Through our recognition of the importance of questions in student learning, and through our active engagement with that idea, Cathy and I were able to move forward with "life-long learning" goals for our students. While the development of such goals may not seem very revolutionary, in reality this was a novel idea for us that arose from grappling with seemingly opposite ideas (goal-oriented standards and general questioning), our ability to see connections between those ideas, and our interaction with each other. Had any of these factors been missing I might have just moved forward with state standards for unit planning and Cathy might have just planned to engage in the questioning activity with her students. However, with all of those key factors in play, the executive schemata were able to flexibly transform data into a novel idea.

Another important distinction to make about the process in which Cathy and I engaged in is that it was not simply our ability to recognize deep connections that allowed us to make the cognitive leap to a life-long learning chart. Cropley points out that novelty is developed through particular processes, such as "synthesizing different elements of information, transforming it, shifting perspective, or constructing analogies lead to novelty, whereas others such as recognizing the familiar, retaining what already exists or reapplying the tried and trusted generate not novelty but orthodoxy and conventionality" (Cropley, 2001 p. 31-32). This distinction is important, because it is possible for a person to have the ability to recognize deep conceptual connections and even organize information in new ways without necessarily engaging in the creative thought processes that allow one to make the

leap to novel ideas. The crucial difference, as Cropley points out, is specific creative thought processes. Therefore, the next ideas I chose to investigate were some of the specific thought processes teachers engaged in as they worked within the space of the executive schemata to develop solutions to the many problems and dilemmas they faced as educators.

Getting Concrete: Specific Thinking Processes

One of the factors in teaching that can be both a blessing and a curse is that teachers are constantly making decisions, yet they rarely face choices where there is a clear right and wrong answer. Studies (e.g. Jackson, 1968, cited in Brubaker, 1993) have shown that teachers engage in as many as 1,000 interactions each day, and other studies find that on average teachers make one interactive decision every 2 minutes (e.g. Clark & Peterson, 1986, cited in Brubaker, 1993). Yet with these constant interactions and decision making, Dale L. Brubaker, a professor who has authored several books on education and educational leadership, points out that "there are few 'right' and 'wrong' decisions in something as ambiguous as educational decision making" (Brubaker, 1993, p. 17). Since teachers are faced with so many ambiguous decisions, part of their development as professionals involves the ability to both clearly understand the "big ideas" inherent in those decisions (by making deep conceptual connections), as well as their ability to think through their choices. The more experienced they get, the more some decisions get automatized (such as what to do when a student needs a pen). However, as teachers start to understand the complexities of some of the problems they face they use critical and creative thinking processes to think through some of these complex problems, such as what to teach and how to teach it. I find making distinctions among figural, operational and executive schemata helpful when attempting to understand how adaptive expert teachers are developing their novel contributions, but I also want to know about those specific thought processes they use as part of their executive schemata. The thoughtful and effective teachers I have known seem to be able

to move back and forth between the concrete application of ideas, as well as the active engagement of their imagination; indeed, they make interesting connections rather rapidly when they are working through complex problems. These teachers always seem to ask the questions that lead them to heart of the matter at hand and that guide them to new ideas. It is also through observing these teachers that I have seen divergent and convergent thinking being used together in interesting ways.

Cropley (summarizing Guilford, 1950) makes a clear distinction between convergent and divergent thinking. He explains that "convergent thinking is oriented towards deriving the single best (or correct) answer to a given question" (Cropley, 2001 p. 32) and goes on to explain how convergent thinking is most useful when a right answer exists, and is most focused on accuracy and correctness. He also points out that convergent thinking tends to lend itself to "recognizing the familiar" and "reapplying set techniques" and is therefore less likely to produce novelty. He contrasts this with divergent thinking when he says "divergent thinking, by contrast, involves processes such as shifting perspective, transforming, or producing multiple answers from the available information and thus favours production of novelty" (Cropley, 2001, p. 32).

Although Cropley sets up convergent and divergent thinking as opposites with convergent thinking producing orthodoxy and divergent thinking producing creativity and novelty, Brophy (1998) points out that a complete creative problem solving process involves both. According to Brophy, successful creative problem solving not only involves using both convergent and divergent thinking, but also involves the ability to alternate between the two, and to see when each is needed. While some might see problem solving as more linear process, Brophy explains how studies show that effective problem solvers actually move back-and-forth between convergent and divergent thinking.

When teachers are engaged in the many decisions they make on a daily basis, as well as the decisions they make with the luxury of more time and reflection, they are engaged in a form of problem solving. Part of gaining experience as a teacher involves building the cognitive tools to recognize a

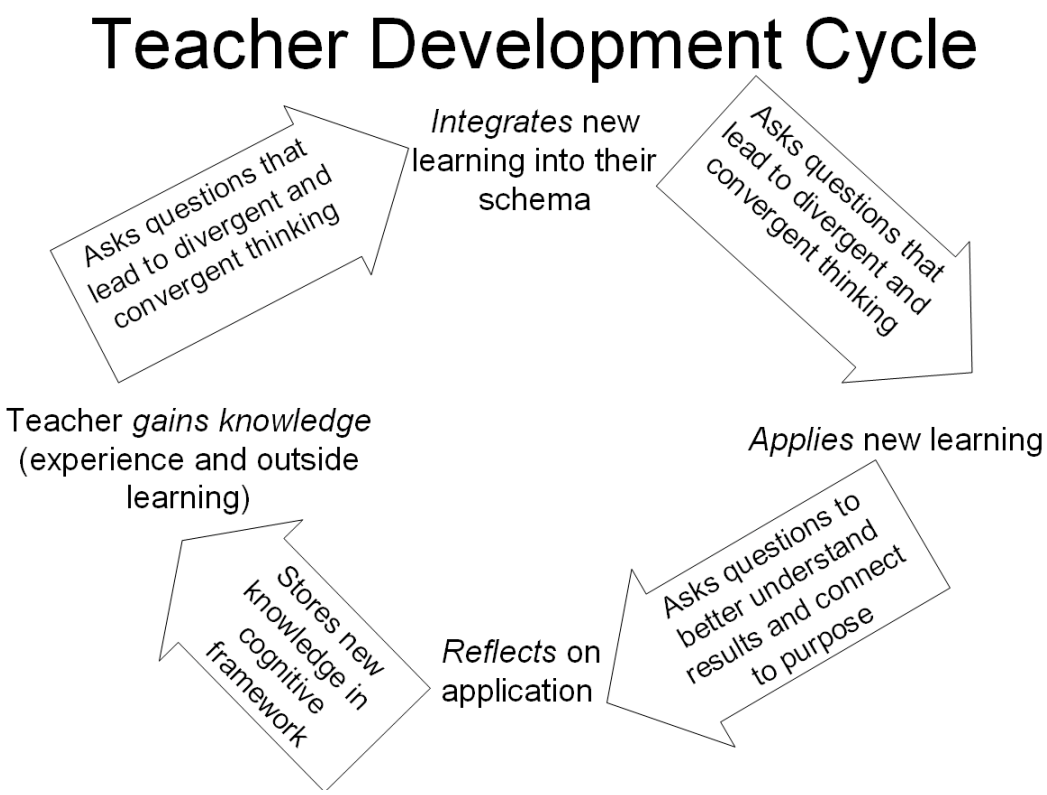
problem for what it truly is and to understand the aspects of the problem on a conceptual level. Basically, in order to engage in productive divergent and convergent thinking teachers are constantly asking questions, especially questions that push them to truly define the problem and look for many possible connections to new ideas as well as their existing knowledge base. In the case of the examples from Bransford et al. (2000), the experts question if lecturing is the only way for students to get information or if, perhaps, there is a better way. In the case of Cathy and myself, we progress in our work because we question what, exactly, it is that our students need to learn. This willingness and ability to question is a fundamental skill that teachers need in order to develop expertise, because without deep questioning, and the divergent and convergent thinking connected to it, they might easily miss important nuances in the complex decisions they make. All of the teachers I interviewed gave examples of questioning the idea that they are limited to the surface level choices they are presented with in the first place, and continue to question throughout their thinking process. It is this constant questioning that allows them to both move their thinking forward and to avoid getting caught in the trap of looking for a simple (but possibly not the best) solution.

This type of questioning and divergent and convergent thinking is something I have seen many teachers engage in, and it is part of what inspired me to interview teachers in an attempt to better understand their thinking processes. Teachers who see two opposing ideas and think they have to choose one may weigh their decision carefully and very thoughtfully using convergent thinking, but without engaging in divergent thinking they are missing opportunities for both recognizing new ideas and developing themselves. Simply put, these teachers are stuck in what Parker (1998) termed "either-or" thinking. However, it is possible to err on the other side as well. Teachers who are always looking for the newest and most "novel" solution may find themselves missing something obvious that could be gleaned from experience if they effectively used some form of convergent thinking. When I reflect on the thought process of the teachers I interviewed, be they in their sixth year or twenty-fifth, I see how

they are successfully using both convergent and divergent thinking to carefully work through complexities in education, and also to make intelligent and thoughtful decisions about their craft. This movement between convergent and divergent thinking is also apparent in the earlier example of Cathy and myself. We converged on doing her questioning activity, then opened up to thinking about how such an activity fits in with other purposes and ideas, then focused on planning a unit, then stepped back to re-examine our true purpose. In this back and forth interaction we were refusing to get stuck in a linear problem solving method, and were instead using both convergent and divergent thinking to build both a better understanding of our instruction and a better product.

Figure 1 provides a visual representation of the larger cycle of thinking that I have seen teachers engage in as they work to improve their practice as well as the variety of thinking processes that move them through the cycle. It is important to note that within the arrows (representing the thinking processes that propel teachers through the cycle) there is a constant oscillation between convergent and divergent thinking that occurs. The cyclical nature of the figure demonstrates how the act of thinking through and applying new ideas and knowledge grows out of teachers' initial knowledge and is also what adds to teachers' knowledge base that in turn spurs further development.

Figure 1



Examples of Thinking: Teacher Interviews

Given an understanding of expertise, particularly adaptive expertise, as well as problem solving, one may question how to investigate teachers' application of these concepts. In my own exploration I found it useful to use teachers' own voices to find patterns in their thinking that led me to see this use of divergent and convergent thinking as well as how these teachers demonstrated the thinking that is characterized by adaptive experts. I am certainly not the first person to see the value of teachers' stories and voices for a variety of purposes. There are collections of stories from teachers perspectives such as *Teacher Lore: Learning From Our Own Experience* (Shubert &Ayers, 1992) and *Teaching by Heart: The Firefox Interviews* (Hatton, 2005) whose primary goals are to show models of reflective teachers as a teaching and learning tool for both experienced and aspiring teachers. As Shubert and Ayers claim in

their preface “Perhaps the greatest potential of teacher lore resides in an oral tradition among teachers who exchange and reconstruct perspectives together. This reflection on experience, this re-conceiving of the meaning and purpose of one's life and contribution as a teacher, is the essence of teacher lore” (Shubert & Ayers, 1992, p. vii). Other collections such as *Why We Teach* (Nieto, 2005) serve both as a reflective tool for teachers, as well as an inspiration. All of these texts are not only rich examples of the use of teacher voices, but also speak to the fact that the act of collecting teachers' stories and “teacher lore” is part of teacher learning and development.

While the teacher narratives I have constructed from interviews serve to be both models of reflective teaching, as well as inspiration for my readers, I am also endeavoring to discover something more specific. Through each narrative I reflect on the thinking processes the teachers use and search for commonalities and differences between teachers. I also reflect on how their thinking processes not only lead to solutions to complex problems, but also help them develop and gain more knowledge along the way. In Chapter 3 I share the stories of three teachers who struggle to think through the space between several different instructional dilemmas they face, such as whether to focus on content or skills, what type of instructional methods to use, or how instruction and classroom management are related. In Chapter 4 I explore how three teachers navigate the complexity of using the knowledge and tools they have developed over time in conjunction with searching for and trying new things in the classroom. In Chapter 5 I examine how teachers take calculated risks to enhance their own, as well as their students', learning. In all three of these chapters I start with a personal example of my own thinking, and end with a reflection on what I have learned from the teachers whose stories and examples I share.

I acknowledge that there are more scientific and quite possibly stronger methods for examining these thought processes than the more informal interviews/discussions in which teachers and I engaged. For example, transcribed think-alouds about specific problems, or extended classroom observations

would have been better tools for a more focused and scientific approach to understanding teachers' thinking. There are several reasons I did not use those types of tools, some having to do with constraints of time and resources. However, one main reason I did not use these research methods to examine teacher thinking is because I found them too narrow for this view of teaching expertise. I wanted to capture teacher thinking across a broad area as well as their development in their social context, and I feared a narrower approach might limit that. I also am aware that, as the example of Cathy and myself reveals, teachers are not just complex thinkers, but also complex people. Through open-ended interviews that allow for spontaneous follow-up questions and investigating interesting realizations in the moment, I hoped to capture an intricate and reflective picture of both the teacher and his/her thinking. Although a convenience sample cannot provide conclusive evidence about teacher thinking patterns, I do believe these interviews will provide an interesting window into the thinking processes of teachers as well as insight and ideas for further and more exhaustive research.

CHAPTER 3

MORE THAN LESSON PLANS: NAVIGATING THE COMPLEXITIES IN INSTRUCTION

"Instruction" is a broad term used to describe the cornerstone of a teacher's job: teaching knowledge and skills to students. In my time as a teacher I have often been presented with instructional tools, such as lesson plan formats and textbooks, or instructional methods, such as reader's/writer's workshop or direct instruction of vocabulary that others claimed would help me teach effectively. In my first few years of teaching I clung to these tools and methods precisely as they were presented to me in hopes that one of them would be the "right" way to teach. However, as my understanding of teaching has evolved, I have realized that there was no single "right" way to teach. Instead, I have found that my best instruction happens when I have a deep understanding of my purpose and I have questioned and thought through the instructional tools and methods I am using.

Experience has also taught me that the best resource for improving my teaching is my own thinking process. Specifically, I have learned to analyze instructional tools and methods I come across, and from this analysis I have learned far more than simply using the tools would have taught me. In order to perform this analysis, I had to question how they could be used and consider my instructional goals. In this chapter I present both my own example of how I began to think more critically and creatively about a tool I used during my first years of teaching, and I also share examples from three other educators who also had to think through their own instructional dilemmas. These educators all discuss different instructional dichotomies that they faced in their time teaching: direct instruction vs. inquiry, content vs. skills and student relationships vs. an academic focus. While these dichotomies all differ I was both interested and inspired by the way each of these educators applied deep thinking to better understand the complexity within these apparent dichotomies, engaging in problem solving using

both convergent and divergent thinking. To set the stage for their examples, I start by sharing one of my own.

My Story: Unpacking the Five-Step Lesson Plan

When I was trained as a teacher, one of the instructional tools I was given was the "five-step lesson plan." This was a format for planning lessons that had five components: a hook, introduction to new material, guided practice, independent practice and closure. During my teacher training I religiously followed this model by typing a five-step lesson plan for every class. I had been told over and over by people I respected that this structure worked with the 55 minute high school class and that objectives such as "Students will be able to explain the difference between metaphors and similes" were not only valuable but reasonable for students to master in those 55 minutes.

Based on this training, I walked into my first day of teaching absolutely certain about what a "good" lesson plan looked like – it had those five steps, starting with a "hook" and ending with "closure" and I was sure that anyone who did not do this in a single period was doomed to fail. In the first two months of teaching 11th grade English I continued to diligently write a five-step lesson plan every day, but only once completed a full lesson. The objective in question was "students will be able to write a compound sentence" something I was so excited to accomplish in that crazy first-year teaching that I never once paused to wonder what value it had. When my teacher induction mentor first met with me, we went over my lesson plans and discussed some of the pitfalls I faced, namely the lack of progress my students were making in their writing development. Then she said these magic words – "You don't need to have a single objective every day – you need to develop more meaningful objectives, which might take you a couple of days to reach – that's fine!" In that moment my head whirled. I was so certain that the five-step lesson plan was an either-or proposition-I could either use it in one class period, or throw it out altogether-that I had missed this seemingly basic idea. However, I

knew that my objectives were lacking, and now I was excited to be given both permission and a vision of how to set and achieve more meaningful goals. By creating more meaningful objectives and lessons over longer periods of time, my students learned more deeply and meaningfully. I started writing week-long objectives such as "students will be able to develop an original interpretation of a poem." With a week to work on such an objective I could get my students from a place where they needed step-by-step guidance on how to analyze a complicated poem to writing their own interpretation independently.

That point in my growth helped me realize how much of teaching was truly complex, even when it was masked in a seemingly clear structure. My mentor opened a door for me to see how I could question and better understand the purpose behind instructional tools. I had focused on the application of the five-step lesson plan as I understood it on the surface. Although this approach did lead to a strong focus, it was in many ways meaningless without the ability to make new connections and to see the deeper purpose in instructional tools. This moment, as well as others along the way, showed me the importance of both questioning the instructional tools and methods I encountered, as well as more deeply considering my purposes in teaching. Questioning did not mean disregarding these tools outright, but it did mean that, as a teacher, I had the ability and responsibility to question how these tools would work in my teaching context and how this tool could further my goals. In the case of the five-step lesson plan, once I began to question it I recognized it for what it was. Each step was a part of the process our brains go through when we learn: the hook is where students were to become interested and have a reason to remember new information, the introduction to new material provided the information they needed, and the two types of practice were designed to give them ample opportunity to practice using the new knowledge so that it would become part of their long term memory. Finally, closure was where the teacher could assess and make sure students had learned what

was intended. This was a far more useful understanding of the five-step lesson plan than I originally had when I was just plugging speeches and words into spaces on a worksheet.

This shift in my thinking is not as seamless as it might appear in this short vignette. I had to adjust not only to a new way of implementing instruction, but also to a new way of thinking that required not only more active attention on my part, but also a willingness to develop a new view of teaching and instruction. Three of the teachers I interviewed also gave examples of ways they thought through issues in instruction. Each of these teachers faced some sort of either-or proposition and shared with me how they thought through it and arrived at conclusions that made their teaching more effective. The first teacher, Kevin, discusses how he negotiates the complexity between two instructional methods: direct instruction and inquiry. The second teacher, Annie, discusses how she negotiates the complexity between two instructional foci: content-focused and skill-focused. Finally, Lily discusses how she finds instructional strength from an area sometimes seen as completely separate from instruction: relationships with students. None of these teachers would consider themselves experts, yet their thoughtful responses taught me a lot about questions I could ask and ways I could think through my own instructional decisions.

Kevin: Negotiating Inquiry and Direct Instruction

Kevin is in his sixth year teaching high school English in a small (400 student) high school in a large urban district. He has taught 9th through 12th graders and currently teaches Language AP and also is the department chair for his school's English department.

I have yet to find a teacher who is as willing to question his instruction as readily as Kevin. In our discussions Kevin describes himself as a skeptical person and explains that he especially questions things that seem easy or instinctive. This aspect of his personality was readily apparent in a collaborative session where he kindly but persistently asks his colleagues to explain their purposes

behind instructional strategies. When our department was sharing strategies we used for teaching vocabulary, it was interesting to watch him try to really understand how other teachers use their instructional strategies. When one teacher shared how he was using a new book with vocabulary lists that students seemed engaged with, Kevin asked this teacher why he thought the students liked the book. While this question at first put the teacher on edge a bit, a lively discussion ensued in which we all shared our theories about why our students sometimes seem to be more productive when given worksheets or other more "traditional" teaching tools. What prompted Kevin to ask this was not a desire to question the other teacher's integrity. Instead, what he was trying to do was to understand the ideas and reasons behind every teaching decision made so that he could better inform his own teaching.

As persistent as Kevin is when it comes to questioning other teachers, he is even more relentless when it comes to questioning himself. Kevin wants to know the "whys" of everything, and he wants the answers to be supported by evidence. Like all of the teachers I interviewed, Kevin would loathe being named an "expert" but it is apparent to me that he is building the conceptual framework of an adaptive expert by questioning and problem-solving his way through the many dilemmas he faces as a teacher. One example of such a dilemma is how Kevin has negotiated the middle ground between inquiry based teaching and direct instruction.

When Kevin first entered teaching, he firmly believed in the importance of free inquiry whereby students would guide their own learning based on choice and interest and used this as the primary method of instruction in his own classroom. As he moved through his first year, he found that he was not fully satisfied by the assessments he was getting from students, yet he was also struggling to articulate both what he wanted them to learn and what they had *actually* learned. In our discussion he commented on the fact that he could look at writing his students had done at the end of his first year teaching and writing they had done at the start, and he could see growth. He knew the essays were "better" but he struggled to identify how they had improved and how to articulate exactly how the

students were growing. Not only was he unsure about what students had learned, he was fairly certain that, even though their writing improved, the writing and reading they did in his 10th grade class has not put them on track for success in college.

In search of knowledge that would help improve his teaching, he immersed himself in whatever research he could get his hands on. He read books and journals. He talked to other teachers, and instructional leaders, but always with an eye to what was known through objective research, not just what someone "felt" worked. As he investigated these issues Kevin found that educational research supported the notion that direct instruction and specific objectives that are clearly communicated to the students usually led to more learning across the board. However, in the same breath that he shares this Kevin also told me that he continues to read new research and new studies in order to discover more about the mechanisms by which students learn. He also continues to question and investigate instructional strategies with the goal of improving his teaching.

After doing this research early in his teaching career, Kevin adopted more direct instruction and clearer learning objectives. He found that that these strategies were more effective both in helping him fully articulate what he expected from students and in helping students reach those expectations. Now Kevin writes down learning objectives on weekly assignments. For example, one of his goals for students is for them to write a nuanced thesis statement in which they acknowledge the middle ground of an issue. For example, rather than writing a thesis that says "marijuana should be legalized," students might write "while there are potential downfalls, legalizing marijuana with common-sense regulation would help decrease potentially dangerous drug use more than continuing our current policy of overzealous marijuana-related drug enforcement." As this example shows, writing a nuanced thesis statement requires certain knowledge and a number of skills, such as deep understanding of the issue at hand as well as a strong grasp of complex syntax. Rather than asking students to just discover how to write this kind of thesis by discussing texts in class, Kevin not only guides them through texts on the

topic, but also shows them several examples of nuanced thesis statements, and provides sentence starters to give students a place to plug in their ideas and create a nuanced thesis statement that is sophisticated in both its content and its syntax.

As he shares his belief in the importance of such specific and direct instruction, Kevin also shares his firm belief that students should feel that the class is about them, not about the teacher. He is less concerned, in his words with "entertaining" students and is far more concerned with "engaging" students. His experience has shown him that students learn the most when they are doing the work and when they are sharing and driving the academic discussion in the class, and so he strives to make the class about the students and not him. He uses texts to engage students in complex ideas and to have them practice developing their own original thinking in addition to their writing and reading. An example of this is his unit on global warming in which students read scientific articles and op-ed pieces from several newspapers. He set up this unit so that students would read one piece, record their thoughts, then read a second piece and record their thoughts, and then read a third piece and record how their thoughts had changed and developed with each subsequent text. Kevin was not looking for his students to arrive at any one specific answer by the end of this sequence. Instead, he wanted them to practice critical thinking and engage with the ideas based on their own interest and background knowledge on the topic. While this inquiry looks very different from the idea of having students "discover" strong writing, it nonetheless follows the principle of students learning by discovery rather than being told to follow an idea simply because a teacher told them to.

Annie: Connecting Content and Skills

Annie has taught in a large urban school district for 6 years. She has taught at both large traditional high schools as well as smaller schools and has taught grades 9^{th}-12^{th} in both English Language Arts and English as a Second Language.

Like Kevin, Annie also came across an apparent dichotomy related to her instructional choices as a teacher. The following example of her thinking is about how she navigated between teaching content and skills. This debate is between skills and content is a common one in many educational settings. The question is, what do we want students to really learn? What is our priority? In science this is often a question of choosing between focusing on the scientific method or memorizing the parts of a cell. In math it is a matter of problem solving and deriving theorems versus simply plugging numbers into given equations. In English it is about literature versus literacy; do we want students to understand the nuances of poems, novels, dramas, etc. or do we want them to be able to read and write more generally? While we all hope to do both, which side should drive our instruction?

Annie is a high school English teacher who has thoughtfully explored this question and who works hard to improve her instruction in a way that allows her students to both learn content and develop literacy skills. When asked about her teaching philosophy Annie first responded simply; she said that in her classroom the materials (in this case books, mostly novels) drive her instruction. On the surface this may sound as if she is coming down solidly on the content/literature side of the English debate. However, when describing how this philosophy actually drives her instruction, Annie demonstrates far more complex thinking.

When Annie explains how she has come to understand and operationalize an instructional balance between content and skills she starts by sharing examples of when she lacked this balance. Annie's early failures showed her that students learn from being engaged in material, and teaching them skills separate from engaging texts will not allow them to fully learn those skills *or* the content of the texts. An example Annie shared with me was her experience of teaching students how to read a text and make connections between the text and their own lives. As literacy instruction has moved into high school classrooms this is a common "reading strategy" which teachers are told to explicitly teach students. Annie recounted her experience teaching this "text-to-self-connection" strategy with a text

that was quite divorced from students' lives. They would read the text aloud as a class, and every once in a while Annie would pause and ask students to write a connection between the text and their lives. Because the students had very little in common with the characters in the story and its setting, the students struggled to make a connection, and the ones who actually did wrote down such useless comments as "the character and I both are girls." In the end she found that her students never really practiced applying the skill *and* they learned very little about either the content or the literary forms in the story.

After experiencing these problems Annie had to re-evaluate her approach and problem solve. As a busy teacher Annie could have just kept plugging ahead figuring she was doing what others told her to. She also could have gotten stuck in "either-or" thinking and convergent thinking, and simply found texts that only showed experiences that her students could easily and directly relate to without much creative thought. Instead, Annie asked herself why she was teaching these stories and books, and thought more deeply about what she wanted students to get out of them. Annie explored many possible reasons for teaching stories and texts in the first place. She considered how sometimes students need to be taught reading comprehension skills, and certain texts provide better opportunities for practicing that. She also considered the value of teaching stories as ways for students to develop a more complex understanding of the world around them. After thinking through these and other purposes, and reflecting on her classroom experience, Annie came to the conclusion that she must question and then decide on what aspect of a text she wants students to engage with. Then her job was to make sure the students were given the tools necessary to engage with it. She also recognized that she might choose different texts for different purposes, and that part of this choice would be limited by the materials at hand, such as which books the school had available. From her perspective, she had to decide what she wanted students to understand about the characters, the author's purpose, the literary devices used, etc, and then give the students tools such as sentence starters and guiding questions that allowed them to

come to these conclusions. So, rather than teaching students to make text-to-self-connections using rote practice, she would ask them questions about how the characters related to their own life *only* if she is trying to deepen their understanding of character motivation *and* if having them make this connections would help them do so.

An example of this thinking at work is her unit on *To Kill a Mockingbird*. When faced with teaching this text, Annie started out wondering about the possible broad and relevant concepts this book could teach her students. After re-reading it and considering the different themes and social ideas in the book, she decided what she really wanted her students to get out of the book was an understanding of the importance of narrator, and why the author Harper Lee choose to tell the story from a young child's perspective rather than from an adult's perspective. In order to do this she had her students practice reading the text like anthropologists who were collecting information about a culture outside their own. She provided packets and questions where students had to record information the narrator had learned about Maycomb (the town in the book) as the narrator learned it. She had students track the knowledge the narrator of the story gained, and how she gained it. At the end she had students fill out complex thinking charts where they tracked their own learning about Maycomb, and saw how it paralleled the narrator's learning about Maycomb. All of these complex strategies led students to not only see how the use of narrator affected the readers experience, but gave them a new way of reading – reading like anthropologists.

When Annie was teaching isolated reading strategies as she had been told to do by experts in literacy and education she encountered a problem: the students were not developing the skill or fully understanding the text and were simply completing an assignment without real and interesting thinking. When Annie decided to tackle that problem she did so starting with divergent thinking. Rather than simply getting stuck on the tools and beliefs she had been given she took a step back and explored the broader purposes of teaching texts. Also, Annie did not get stuck by looking for only one way to teach

all texts. Instead she explored the different ideas and knowledge that she wanted her students to gain from a variety of texts. It was this type of thinking and problem solving that lead her to discover and teach her students to read *To Kill a Mockingbird* like anthropologists and she has continued to use this problem-solving approach each time she starts a new text in her class.

Lily: Connecting Instruction and Relationships

Lily has been a teacher for over ten years in both adult education and high school She currently teaches English as a Second Language in a large urban district where she teaches student groups that are both culturally and linguistically diverse.

The examples I have shared from Kevin and Annie both deal directly with instructional choices: in Kevin's case, instructional methods, and in Annie's case, instructional foci. The example I have chosen to share from Lily is less directly related to instruction, although it does deal with her navigating the complexity of instructional expectations and student relationships. Like Kevin and Annie, Lily demonstrates how both divergent and convergent thinking improves her instruction, in this case through the connections she makes with students to promote deeper learning.

When talking to Lily two things are quickly apparent: she firmly believes that language is power and she cares very deeply about her students. Lily entered teaching in part because of her experience in other "caring" professions. She had worked on a literacy campaign for Cuban immigrants and also with domestic violence victims who were mostly Latino and primarily Spanish speakers. Through these experiences Lily quickly noticed that people were powerless without access to the dominant language, English. After her career in these professions she wanted to do something concrete where she could really see helping people, especially helping to empower them through language. Teaching seemed to hold a methodology that allowed her to do something concrete.

Lily started her teaching in adult education, which was focused much more on teaching people competency skills to deal with living in an English-dominant country. She developed a lot of creative projects and tried hard to make them authentic for her adult audience. For example, one of her units was health related and taught both the language of health care and also contained a component about developing self-esteem and "feeling good" about oneself. Lily later made the transition to teaching high school ESL. While Lily had always tailored her teaching approach to her audience when teaching adults, she soon saw that this same approach was perhaps even more necessary in high school, although sometimes it was more difficult to do so because of outside academic pressures such as MCAS and district mandates. She also learned quickly that classroom dynamics played a large role in the effect of her instructional choices. Although her first year teaching high school was stressful, Lily found that her second year was much harder than her first for several reasons. This was partially due to Lily feeling a lack of energy, but she also explained that the chemistry of her classes was very different that year. As she puts it "the chemistry of a class can make or break a year." This understanding of the importance of class chemistry and its relationship to students' emotional and social needs had a direct impact on Lily's instructional decisions both that year and in future years.

When Lily discusses her instructional strategies, they are integrated with her assessment and evaluation of the students in front of her, both in terms of academics and emotional/social needs. She also takes into account her understanding of herself and her relationship with those students. One of the issues Lily encountered when she moved from adult education to high school was the shift in focus from, in her words, competency to academics. Put another way, with the adults she taught was able to focus and tailor her instruction to their day-to-day needs. With her students she still was focused on their needs, but those needs now included academic skills necessary for post-secondary education, and the academic skills needed to pass standardized tests. This was all in addition to the very real world

tools her students needed to survive day to day as many of them were lacking English proficiency in an English speaking country**.**

When Lily began teaching high school she struggled in to integrate the needs of the students emotionally and socially with these academic demands, especially since she had always integrated these emotional and social needs using instruction that focused on her adult students' immediate and authentic needs, something that she found harder to do when preparing ESL students for the MCAS. During her first few years teaching she developed the understanding that students need to be open to learning, which often means being open to the teacher at some level. She saw that, without this openness, there would be little learning. Therefore, in her mind, part of the job of the teacher is to get students to open up, which involves building relationships. To her, getting students to develop academically means developing relationships with them so that they are willing and able to learn from her and trust that what she is teaching them is valuable, even when it is something that does not seem immediately relevant to their current lives.

Lily developed an awareness of the importance of knowing her students and building relationships with them through both positive and negative experiences. One example of learning from her own early lack of awareness was when she had a difficult student during her second year teaching an ESL 2 class. According to Lily, this student was “contrary” according to Lily and a total pain. Lily described how this student always said she had a headache, although Lily doubted that was the case. Lily felt frustrated and irritated with this student, until she learned from a colleague that the student was being abused. This same colleague was the one who caught and reported the abuse. Lily explained that she had always valued her relationship with students, and saw it as important, but this experience really pushed her to question herself and her interactions with her students. This experience made her rethink a lot of her relationships with students and reinforced her understanding that teaching is about

more than the content: it is about relationships though it is sometimes overwhelming to negotiate these complex factors.

Lily says that this experience and others have made her focus on investigating the "whole" student even though, as she points out, for teenagers the "whole" kid is not there yet – they are still developing. The way she puts this into action is in part by questioning herself and thinking more broadly about possible causes for problematic student behavior. Rather than writing off a student with difficult behavior, she tries to discover who they really are. One example of this is a student she had who was pompous in class and frustrated a lot of teachers with his attitude. From listening and asking around Lily learned that the student in question was amazing in track and he responded entirely differently and positively to the teachers who came to watch him at his track meets. Lily now sees her relationships with her students both as part of the joy of the job, and also as tools to help further her students' knowledge and academic skills, since students that have a good relationship with her also learn from her. She also sees that part of building this positive and trusting relationship requires making sure students are learning. As she puts it, students are "pissed off" if they feel like the teacher is not trying to teach them. In the same way that she earnestly tries to develop relationships with students, she also has developed a school reputation as a "hard" teacher, but a teacher who *will* make sure that students learn. She definitely believes that part of her success in getting these students to learn has been the fact that she also gets to know them and respect them as people, not just passive receivers of information. In this way Lily sees that personal relationships with students are an integral part of the instruction and learning in a classroom.

Reflection

The lessons I have learned from colleagues such as Kevin, Annie and Lily have less to do with "how" to teach and far more to do with how I think about teaching. When I reflect on the examples of

their thinking that they shared with me, I am struck by some of the commonalities between them. All three of these teachers saw the various issues they faced as dilemmas to be sorted out, rather than as simple either-or choices. Also, they all seemed to ask questions about the nature of the dilemma they faced, even if some of this questioning was done on an almost unconscious level. Kevin had to ask himself about the purpose of both inquiry and direct instruction, and had to question what he needed students to learn in order for them to be on track for college. Annie had to ask herself what the purposes of these reading strategies were, which led to her wonder what she *really* wanted students to get out of the texts they read. Lily considered how the success she had with authentic instruction could be used to help with academic instruction. She was also willing to question herself about why she had not considered possible reasons (such as abuse) for the contrary behavior and "headaches" of one of her students. When I listen to these teachers recount this thinking, it makes me rethink some of the dilemmas I have faced in teaching. For example, I have often felt that I could not do true, authentic problem-based learning in an English classroom when my students need to be prepared for the MCAS. However, I now wonder if I need to, instead, question the purposes and ways to use problem-based learning, and reconsider my idea that somehow problem-based learning and standardized tests are antithetical to each other. The teachers I have interviewed have figured out that questioning the nature of at least some the problem in front of them is a starting place for arriving at more useful creative solutions.

I also appreciate learning about how these teachers then seek out ideas to help them make decisions about the instructional actions they will take. One important aspect of teaching is that only so much of it can be theoretical. Eventually a teacher has to face his/her students and make a decision about what to do. While all three of the teachers discussed here seek out ways to improve themselves and their instruction, they do so in different ways. I found it interesting to compare Kevin's desire to learn from objective research to Annie's focus on thinking through her own motivations as well as

Lily's ability to learn from past mistakes. In reality these are small snippets from each individual, and their developmental resources are surely more well-rounded than it appears here; I am sure that Annie and Lily look at research and that Kevin learns from his mistakes. Yet, even these limited examples have helped to shape my concept of what it means to seek out solutions. When faced with a dilemma in teaching, teachers need to be able to seek outside ideas as well as filter what we learn through our own lens. Annie and Lily also showed me the value of considering my own purposes and motivations before I move forward. These teachers helped me realize that I need to keep an open mind and be willing to adjust my thinking when I come across new ideas, such as the idea that direct instruction can be more beneficial than inquiry in some situations, as well as recognize what my purposes and goals really are.

In some ways these teachers are all engaged in a similar problem solving cycle. They start by trying to really understand the nature of the dilemma they are faced with and then take the time to wonder and consider aspects of instruction, their own goals, their own experiences, etc. that might help them better understand their dilemma and which actions to take. Eventually they reconnect and reorganize everything they have learned into a framework they can use to take action, and then act, but with an eye towards how they can learn from the results. Seeing them engage in this process gives me tools that I can use in my own thinking about teaching.

As I look at the thinking of these three teachers, I see aspects of both adaptive expertise and divergent and convergent thinking. When Lily shares how she learned from her lack of interpretation about a student's actions, she is developing a new way of organizing her understanding of student behaviors. Now she might catalogue them in terms of their possible root causes, not the way they disrupt her class. When Annie considers the many possible purposes for teaching *To Kill a Mockingbird* and then chooses the best one for her goals for her class, she is engaged in divergent and convergent thinking. She demonstrates divergent thinking when she thinks about the many things this

text can teach her students without being stuck by the constraints of contents vs. skills. This open thinking is also what helps her make connections between the act of reading and other ways of understanding how to decipher a text, such as reading like an anthropologist. However, once she has thought through the almost infinite number of ways she can teach a text she is able to choose one that best fits the parameters of the situation to focus her instruction. When Kevin finds ways to integrate inquiry and direct instruction into the teaching of the same objective, he is finding connections that might be missed if a teacher was stuck seeing direct instruction and inquiry as a dichotomy. By being open to using the best instructional methods for the learning objectives he has set, he is engaged in a form of divergent thinking when he is willing to consider direct instruction, even though it is not what he initially values. Like Annie, once he has developed a long list of options, he is able focus in and use convergent thinking to evaluate his options and choose the one best suited for his instructional purposes.

While these terms have helped me develop a framework for looking at these teachers' stories, I find that using them still does not show me the full picture. Something that stood out to me when talking to all of these teachers is how much thinking they are doing without even realizing it. They are constantly prioritizing where they put their focus, what options they have, etc. They seem to be simultaneously open to the most outrageous ideas, all while understanding that they have limited resources that shape what they do in their classroom right now. All these teachers are engaged in deep and active thinking about their instruction, and in doing so are building their capacity to better understand the next dilemma they will face. Each gained knowledge that they can call on next time they face a dilemma, and have not only increased their quantity of knowledge, but are organizing it based on “big ideas.” This means that they have more ways to make valuable connections next time they engage their executive schemata to solve the complex problems in teaching. What I and others

can learn from them is how to open our own thinking, and how to address the problems and choices we face as teachers by thinking through them instead of getting stuck in and “either-or” mentality.

CHAPTER 4

REINVENTING THE WHEEL VS. PULLING OUT THE BINDER: NAVIGATING THE COMPLEXITY BETWEEN PAST EXPERIENCES AND NEW IDEAS

While the previous chapter focused on how teachers navigate the complexities of instruction, this chapter examines a related issue that has cropped up many times in my short career as an educator: how to integrate new ideas with past experience and knowledge. As demonstrated by the teachers in the previous chapter, the instructional choices a teacher makes are very much informed by their prior knowledge base. Kevin, Annie and Lily also show how learning new things, such as about direct instruction or reading strategies, can lead to instructional improvement. In this chapter I share examples of how teachers think through and combine their use of past experiences and new ideas. This process of integration is not only complex, but also is different depending on the individual, the context and a myriad of other factors. The examples I am choosing to show here cannot capture all these factors, but they do provide foundational ideas about how teachers integrate new ideas with prior knowledge. These examples, coupled with examples of risk-taking discussed in Chapter 5, provide a basis for thinking about some of the productive ways teachers integrate old and new ideas and resources as their thinking develops over time.

I had one of my first encounters with navigating some of these the complexities in my teacher credential program. The professor teaching the course on classroom management had taught high school for ten years before becoming a college professor. She had many quirky moments in class, but one of her remarks has stayed with me, even though I did not truly understand it at the time. She described her best teaching situation as the time she had a binder fully prepared for each unit. When speaking about this time in her career, she vividly recounted how easy her teaching life was when she

could say, “First term – time to get the Egypt binder” and simply pull the Egypt unit binder out and pull out the first lesson plan, complete with transparencies, handouts and assignment sheets. She was very proud of the fact she reached this point in teaching where everything was always ready to go.

Now, there may have been more to this story than she told us. She may have adapted her lessons over time, or used the time she no longer needed for planning daily lessons to create other interesting and authentic projects for her students. But none of that was ever mentioned. At the time I was a first-year teacher who spent hours every night figuring out what I was going to do the next day in class. Needless to say, being able to pull out a binder of fool-proof lesson plans sounded like teacher nirvana to me! Yet, as I have continued to teach, I have come closer and closer to the realization that I will never have those binders, nor do I want them. Every year I develop lesson plans, assignments, unit plans, and other tools that are effective and that I will use over and over again. However, I am constantly adapting these tools based on the students in front of me, the essential question for the year, the aspects of my teaching I want to improve, etc. I rarely reuse anything exactly as I used it the year(s) before because I am always striving to improve myself as a teacher.

However, fully recreating lesson plans every year is not a solution either. Mentor after mentor has warned me against “reinventing the wheel.” Their basic premise was that I was not the first person to try to to teach students how to find the theme of a story, or how to write a persuasive essay. Therefore, I should learn from those who came before me, and use the tools that are available to me, be they from others or from my own experiences. Earlier in my teaching I had a hard time using tools that others developed, and often created my own lessons and assignments based on the new ideas I had at the time. This meant that I often spent hours developing a lesson that already existed, often in a better form. I had to learn how to take advantage of these tools which freed me up to explore other important aspects of my craft.

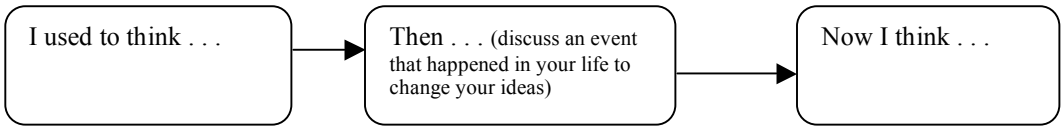
Learning and developing as a teacher is more complicated than it may seem to some. There are

people who think that teacher learning is confined to professional development sessions or college classrooms. There are also teachers who think they have to reinvent the wheel and re-plan entire units and change their classroom systems drastically year after year, just are there are teachers who take the opposite path. These teachers model my credential professor, and have a binder for every single unit they teach. When it comes to the point in the year when the *always* teach that unit, they pull out that binder, complete with lesson plans, handouts and transparencies, and simply implement it just as they did before. The teachers who embody these extremes are rare. Most teachers find some balance as the teachers I interviewed did. What I find interesting about these interviews was not just the fact that these teachers managed to balance their past knowledge with new ideas, but *how* they did this. In the first two examples I explore how two long-term teachers, Fred and Carla, both seek out new resources and new tools to help them improve their lessons over time. I also explore how a younger teacher, Kent, strategically applies new ideas in his classroom after making sure he has a strong enough grasp on the basics. In order to help provide my perspective, as well as another example of this type of thinking, I start by sharing my own experience using a new tool to help students improve their writing and how I adapted that tool based on my experience with effective writing instruction.

My Story: Improving Writing Instruction with Kernel Essays

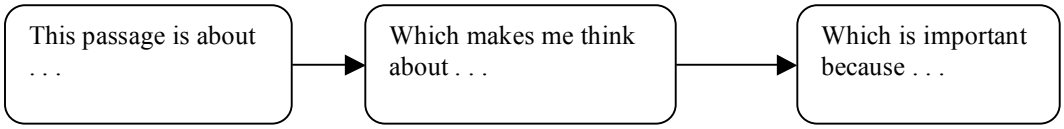
As a teacher who wants to improve, I am always looking for new ideas for my classroom. During one school year I focused on improving my writing instruction so that my students would produce more thoughtful and analytical writing. As I reflect back on this experience, I now see how I had to both open up my thinking and critically question the tools I was given in order to fully capitalize on both my previous experiences as a writing teacher, as well as the new ideas to which I was being introduced. During that school year I implemented a new way of teaching writing in my classroom by building on lesson plans and writing pedagogy I had developed over my first few years of teaching. In

previous years, I had developed a successful system for teaching writing that involved giving students free-writing prompts to help them develop their thesis statements and then graphic organizers to help them develop a basic five-paragraph essay. I felt confident about how to teach students how to organize such basic essays, but still I struggled to help them move beyond the five-paragraph model into a more sophisticated piece of writing that had stronger topic development. Through a discussion with the writing coach at my school I arrived at the conclusion that I could grow in this area by improving how I instructed my students in developing ideas during the pre-writing stage. This led the writing coach to introduce me to the idea of "kernel essays" developed by Gretchen Bernabei in *Reviving the Essay: How to Teach Structure Without Formula* (Bernabei, 2005). The concept behind kernel essays is that students' pre-writing should follow how their brains naturally develop ideas and give them the tools to see the connection between their thoughts, therefore facilitating topic development. In Bernabei's book, there were models of the "kernel essays" where student had to complete several sentences that were placed in a graphic organizer such as this:



However, in the book, most of the examples of "kernel essays" were designed to help students write personal essays. My goal was for my students to write analytical essays, primarily about literature. So, the writing coach and I played with some ideas about how to write a kernel essay for literature. After much discussion, brainstorming, and trying out sentences starters on myself, I developed a working model of a kernel essay I thought would help my students develop their ideas instead of simply making three semi-related points about the novel we were analyzing. Throughout this whole process I had in mind the work I had already done to develop students' writing organization;

it was important for me not to let go of that success. This process of collaborative discussion, practice and individual thinking led to a product for my classroom that was slightly different than the kernel essays in the book. Instead of focusing on their personal experiences I instructed my students to start by picking out a passage from the novel that they thought was important to the meaning of the book. Then, using that passage, they were asked to finish the kernel essay sentence starters in their notebook. The kernel essay they were given looked like this:



Although the details of this process might be more interesting for a book about writing, what is illuminating from a teacher-development perspective was how I actively negotiated the space between my old knowledge and new ideas. As a teacher I have found that just using tools by themselves is often useless, because in order to fully understand them one must understand their purpose and one's own purpose as well, as discussed in the last chapter. In addition to this, however, it is very important to consider both what you (as a teacher) have experienced and developed in the past in order to see where a new tool fits in. When I encountered the kernel essay I was asking myself what my goals for my students were so that I could adjust the kernel essays accordingly. However, in order to fully utilize the kernel essays I had to not only question my instructional purposes, but also ask myself how this tool and my goals fit in with instructional tools I had developed previously. I needed to seriously consider if I was using my previous work because it fit my students' current needs or if I was using it because it was easier than making something new. I also had to see how my structured organization charts could or should fit with the more open kernel essays. By being willing to question myself, my experiences and the tools I had developed I was able to provide my students with stronger writing instruction than I

had done in years past. Like the teachers I discuss next, by thoughtfully considering previous knowledge and questioning new knowledge I was able to arrive at solutions for my classroom that were far more useful than if I had just used new tools or simply pulled out the same lesson plan for the fifth year in a row. In addition, this thinking process helped me make connections and develop understandings that make it that much easier to learn and develop as a writing teacher because this thinking was also a chance for me to practice and develop the ability to sort and use tools. In the next example Fred, a veteran teacher, follows a similar thinking process when he considers how to integrate new academic goals with the strong instructional tools he developed when he was teaching all subjects in special education classroom.

Fred: Developing Through Transitions

Fred is a 31 year veteran of a large urban school district. He taught in middle school, in high school, was part of a planning committee for two pilot schools in his district and, towards the end of his teaching career he was named Teacher of the Year for his city. He currently works as a new teacher developer for this same school district.

Talking to Fred can leave the listener feeling as if they have been caught in a whirlwind. What struck me most in our discussions was the excitement he exuded when he talked about all the twists, turns and changes he has gone through in his educational career. I was especially surprised and impressed by how he looked at each career shift as another opportunity to both apply what he had learned previously and also to learn new things about teaching. In his sometimes chaotic trek across a large urban school district Fred kept a balance between using what he had learned and developed over time and gaining new ideas and insights from varied situations.

Fred started his career as a bilingual counselor, but quickly moved into a high school special education teaching role. When he started teaching, special education classrooms were multiple-subject

and self-contained, meaning that Fred taught all subjects to his small group of special education students. A few years after Fred started in this position the district made a shift in how special education was taught. The district put special education students into mainstream classes whenever possible, as part of an attempt to put these students in the "least restrictive environment," and also provided content specific special education classrooms when necessary. For example, a special education student might attend a mainstream science and history classroom, but be in a "resource room" for math and English. Due to his experiences with languages and literature Fred became one of the English Language Arts teachers for special education students in a resource room.

When Fred discusses becoming an English Language Arts teacher it is fascinating to see how he integrated his experiences with multiple subject teaching into his new, more academically focused role of single subject teaching. When he taught multiple subject special education that was more vocationally focused, he had learned how to help students draw connections between the work they did and the math, science, history and English he had to teach them. For example, he would have a thematic unit about a real-world situation where students had to use math and physics to solve problems, and write descriptive explanations of a task, thus teaching all content areas in a way that would be grounded in what students understood to be real-world skills. This focus on connecting to students lives in an authentic way was in part due to the expectations of the times. At that point in educational history, special education students were not expected to achieve much academically, and many schools believed that these students needed to be trained for jobs right out of high school rather than being encouraged to pursue post-secondary education. Although Fred disagreed with these low expectations he did see the usefulness of connecting his lessons and teaching to real world applications. He saw how students retained knowledge better when they had some application to ground it, such as understanding the Pythagorean theorem when they had to use it to build something, or how they were more likely to revise their writing when it was going to be read by an authentic audience.

When Fred's role changed into that of a special education English Language Arts teacher who was supposed to put his students on a post-secondary education track he could have chosen to dismiss these tools in favor of a more "academic" approach that was less connected to real-world applications. Or Fred could have simply recycled the English portions of his previous lessons without rethinking his curriculum. Instead, Fred understood that he did not have to choose one or the other; what he did was create an English Language Arts curriculum that taught students the academic skills they needed while also using literature to help students understand and make sense of their own lives. In his role as an English teacher he was always scouring literature both for ways to connect traditional literature, such as Shakespeare to students' lives and also ways to find texts that students could readily read and relate to. For example, he started his unit on Romeo and Juliet by tapping into his students' understanding of rivalries and family strife before delving into the play. He also did not hesitate to engage his students with complex ideas and language.

In addition to finding ways to connect more traditional texts to students' lives, he also sought out texts that were more directly relevant to his students. Every year he added to his list of books that engaged students, and he eventually built up such a reservoir of knowledge that he was able to put a number of new titles on his district's list of approved books for middle and high school classrooms. These included texts such as *The House on Mango Street* and *An Island Like Me* that shared stories of children and teens in neighborhoods more similar to his students' than some of the settings in books like *To Kill a Mockingbird* or *Night.*

This example is just one of many ways that Fred used his previous experience to support and build new ideas. He was asking himself certain types of questions that led him to integrate his old and new ideas, rather than being stuck picking one or the other. For example, rather than seeing the shift to a single-subject classroom as a completely new way of doing things Fred asked himself "What have I learned works with students?" and "How can those ideas be used in other ways?" Considering these

questions also led Fred to consider other questions, such as "How can traditional literature connect to students lives?" and "What other texts exist that relate to students?" On some level these questions might seem basic. After all, shouldn't all teachers consider a range of texts, or try and apply texts to their students' lives? The reality I have experienced, however, is that teachers (myself included) can get stuck doing things "The way they have always done them" because it is good enough – or seems to be. By the same token, Fred could have asked the question "How do I teach in this brand new environment?" when he started teaching a single-subject class. Instead he recognized that there were ways to integrate his experiences and ideas, both old and new.

Carla: Old Lessons, New Tools

Carla is a 26 year veteran of a large urban district. She has worked all 26 years in the same high school, moving between English as a Second Language classes and English Language Arts classes across all grade levels. She also runs a variety of student clubs, coaches sports and is a published poet.

When I first entered Carla's secondary ESL classroom I immediately saw why students would choose to spend time there long after the end of the school day. Colorful and interesting student work is posted all around the room. There are a number of round tables in the place of desks so that students can work in groups in what Carla calls her "café" Carla herself is vibrant and inviting and when she talks about her teaching experience she is animated. Like Fred, Carla has been teaching in a large urban district for a number of years. Unlike Fred, Carla has been in the same school for those 26 years although she has shifted back and forth between teaching English and ESL. One might expect a teacher in this situation to simply do the same thing year in and year out and be a classic example of "pulling out the binder." However, Carla turns out to be another teacher who refuses to stick with an extreme and is instead constantly negotiating between tools she has used successfully in the past and

new ideas that she is always on the lookout for.

Carla's excitement about learning new things and then applying her learning in the classroom shades everything she does. When Carla goes to workshops or professional development she is always looking for what she can take from it for her students. As she puts it, the way to make these workshops and professional development sessions useful is to go into them with the purpose of taking away new ideas to use in the classroom. Her excitement about learning is also very apparent when Carla discusses her use of technology, both in her classroom and for herself. In fact, her use of technology is a prime example of how Carla effectively integrates her past experiences with new ideas in order to improve her teaching. Carla's face lights up when she discusses doing online searches that result in her students creating power points, listening to grammar podcasts and learning about the elements of a short story from songs. What is interesting about this pursuit of new tools is that they do not replace the methods and instructional focus that Carla has found to be successful in her classroom. Instead Carla seeks out new ideas and then uses them to support the work she is already doing and to add to the lessons and teaching tools she has developed over her time as a teacher.

One example of this process is the how Carla integrated the use of electronics into her classroom. Over a number of years electronics, such as cell phones and mp3 players, have become more and more ubiquitous. Many schools, including Carla's and my own, have worked hard to enforce bans on these devices. However, Carla looked at her students wearing their headphones and using their cell phones and saw it as an opportunity to build on the lessons she already had. As she put it, "Why not take our lessons and put them in a form that they (the students) like?" So, Carla, who loves using computers and the internet, searched for audio tools that she could use to help her students, especially those who were just learning English. She found a lot out in cyber world, but contrary to sounding overwhelmed by this, she seemed excited. She started sorting through what she found, in part based on her knowledge of what type of instruction best supports students. One of the tools she found was

grammar rules explained and taught through computer games. She showed it to her students during class, and then watched as they had fun and played, learning grammar all the while. Some of her students even continued to play it at home, even though it was not assigned. For Carla this was exciting because, as she explains, she has fun learning and is thrilled when her students are also learning and having fun at the same time. But Carla was not just throwing in a "fun" activity for the fun itself. When she found this tool, she strategically saw how it connected to the specific grammar concepts that she has learned would best serve her students. This knowledge about the plethora of English grammar concepts her students really need is an understanding that Carla has developed over her years of experience. Rather than haphazardly using new tools and ideas year after year, Carla actively integrated this new technological tool into the grammar lessons that she had honed and developed over time.

A similar example of Carla's integration of her experiences with new tools was her use of music in her class. In this instance Carla described a song she found on the internet that taught the elements of a short story. She downloaded the song and played it in her class. Not only did her students get into it and ask her to send it to them so that they could use it on their mp3 players, but the students also aced their quiz on the elements of a short story. As Carla says, it is not only fun to use these tools to teach, but they also work! However, this did not cause Carla to abandon everything she knows about how to teach short stories. Instead, this new tool was just one piece of the unit that Carla used to teach short stories. In conjunction with this new tool Carla taught the same short stories that she has used over many years because they display elements, such as character development and plot structure, in ways that students can readily see. Carla is always negotiating between what she knows works and what she sees as new ideas that can further enhance student learning. These new tools may be somewhat useful on their own, but combined with Carla's educational experience and expertise, and the knowledge she had developed and honed, these new tools become instructional powerhouses.

Like Fred and the other teachers discussed here, Carla engages in a thinking process both when she is learning from experience and when she applies that experience to new ideas and new tools. Part of the reason Carla's lessons are so effective at engaging her students is that she is constantly questioning the best way to reach them. When she saw students with headphones and cell phones she did not immediately get angry or annoyed, but instead kept her mind open and wondered why they enjoyed those things so much, and asked herself how she can capitalize on it. She also was actively seeking out the tools that she could use, by going on the internet, searching for ideas and allowing herself the time and freedom to play around with interesting things she finds.

However, Carla is not just trying to find the latest and greatest thing that will capture her students' attention. Although she is open with her search for new ideas and tools, she is simultaneously asking herself "How will this work with my students needs?" and "How does this fit with the lessons I *know* work?" It might be tempting for some teachers to use a song or game from the internet just because we know students will be engaged, and we figure it will teach them something. What Carla does, though, is stay focused on her purpose, even as she opens herself up to new ideas. It is this combination that makes the new lessons and tools she develops so effective.

Kent: Supporting Student Thinking

Kent is a physics teacher in a small (400 student) high school located in a large urban school district. He has taught physics for seven years. As a result of his experience student teaching, he was one of several teachers who piloted a curriculum entitled "Active Physics" during his first year of teaching. This program was designed to make physics more accessible to a great number of students using principles of discovery learning. In addition to these roles Kent served as the science department head for several years.

Unlike Fred and Carla, Kent is not what one would term a veteran teacher. He has been

teaching for seven years, which seems to have been enough time for him to have developed experiences and ideas that shape how he uses new ideas he encounters, although he does lack the quantity of experiences that Fred and Carla have. Yet, like Fred and Carla, Kent's ability to both critically analyze his experiences and his openness to new ideas help him continuously improve his teaching.

When Kent first started teaching physics, he was part of a pilot program in his district to teach "Active Physics." This new curriculum was designed to engage all students in physics, and to teach physics through discovery learning, where students would do labs that demonstrate the principles of physics in order to "discover" the principles for themselves. Kent had an interesting journey in learning to use this curriculum, which helped shape the way he adapted tools in his classroom later on. His first year he would, in his words, "go on tangents" instead of more strictly following the curriculum. As he explains it, he did not really know how to prioritize the time spent on certain content, so by the end of the year he had not covered all the material. During his second year he realized that he needed to follow the curriculum in order to know what to change, so he taught the lessons and labs as they were outlined in the curriculum materials. This experience helped him understand how the lessons and labs looked and worked with students. During his third year this allowed him to make changes to his implementation of the curriculum based on the knowledge he had gained from classroom experience. Kent also explained how he was able to make these changes based on the purposes of the program, in part because he knew the teacher who had originally created the curriculum. His work with the creator of the curriculum allowed him to understand the reasoning and purpose behind the individual lessons in the curriculum, as well as the big picture. By using these purposes to drive his modifications, Kent was able to preserve the intentions of the program while improving its implementation.

Fast forward a few years and Kent is still engaged in a similar thinking process as he continues

to improve his own teaching. By continuing to use his knowledge from experience, as well as his understanding of purpose, Kent is able to more effectively integrate new ideas into his classroom. One example of this is the way he has developed the use of concept maps in his classroom. Concept maps are diagrams that show the relationship among concepts (appendix B). In physics this might be a diagram showing the relationship among concepts such as gravity, mass, acceleration, velocity and speed. When Kent first encountered concept maps in a graduate school class he knew he wanted to use them in his class. However, to use them well required him to take time to really think about how he wanted to implement them. When Kent describes how he thought about this new tool he seems to be asking himself "What do I like about this tool that makes me want to use it?", "What are the purpose of using this tool?" and "How can this tool help me improve what I am currently doing?" and then staying open to many possible answers from his own experience as well as outside sources. In the case of the concept maps, Kent saw a connection between the application of the maps and achieving something he worked hard on in his classroom: helping students understand the big picture behind the physics details they were learning. Kent explained how he strives to get his students to fully grasp the connections between all the specific physics concepts they learn. Often students will be able to understand smaller pieces of the material, such as calculating speed or explaining some aspects of gravity**,** but they do not really understand the big picture and how all these things are connected. Kent believed that creating concept maps could help students make these connections. After trying them out he says that the concept map worked very well for some students in terms of helping them understand the big ideas they were studying, although it certainly did not work for every single student. He also explains that the concept map helped him achieve two goals. Firstly, it was a learning tool for students that could help them develop the "big picture" understanding that he wanted them to have. Secondly, when Kent looked at the concept maps he found that they were useful assessments of the students' understanding of both the "big picture" and the details he had taught them. Later on, Kent worked concept maps into

his end-of-term assessment system, where he uses them, as well as a project and more traditional test to get a holistic view of his students' learning.

Though he has had less experience than Carla or Fred, Kent exhibits many of the same thinking tendencies. One interesting part of Kent's story that stands out is the fact that he realized that he had to follow the Active Physics curriculum closely in order to know how to change it. Carla and Fred might very well have had similar points in their career, but have forgotten them, or neglected to mention them because they seem farther away. For Kent, this experience shows him building from a strong foundation of experiences which he can use to develop new ideas for his classroom. While the modifications he made to the Active Physics curriculum in his first year could be classified as "tangents" that were not very useful, the modifications he made his third year were not only an improvement in his classroom, but also an improvement for the curriculum, so much so that many of them were written into future versions of the curriculum. The key differences for Kent, between his first and third year, were his experiences seeing how the curriculum worked and developing a deeper understanding of the reasoning and purposes behind the lessons and labs in the curriculum. Whereas in his first year he might have been asking himself questions such as "What would engage the students?" or "What else can I/should I teach about this topic?" by his third year he was asking questions such as "What is the purpose of this lab?" and "What prior knowledge do students need to help them understand this concept?" Although there is nothing inherently wrong with the questions he was asking in his first year, by his third year there was a focus to his questions and modifications that were grounded in his experience, which meant that changes he made were focused improvements rather than whims.

Kent applies this same type of focused improvement in his use of concept maps. When Kent encountered this tool he had enough experience to both know that he wanted to use the tool and to understand how it could help his students. It took experience with students and teaching for Kent to be

able to understand that getting the "big picture" was something that was both important for students to learn and difficult to teach. When he encountered the concept map he was excited, but still questioned the best way to use it. He had to ask himself not only "What is the purpose of this tool?" (much like Kevin, Annie and Lily) but also "Does this fit into what I'm teaching now, and if so, how?" and "What are the ways students can use this to learn?" In addition, Kent learned from his experience using the concept map but continuing to ask himself questions even while he was trying it out with students. When he saw how it helped students learn he asked himself "How else can I use this tool?" which led to it become a part of his assessment system. Kent's openness to both new ideas and tools, as well as his continued focus and refinement of his purposes seems to be a large part of how he has become the strong teacher he is now and how he continues to grow.

Reflection

As a sixth year teacher myself I find it empowering to look at three teachers and see how they learned from their experiences and reflections. Like these three teachers I also seek out new ideas and inspirations for my teaching, be it from educational texts, professional development workshops or other resources. What I see these teachers doing once they encounter new ideas is what interests and inspires me. Although the form and focus they take is different, all three of these teachers seem to be both seeking out new ideas as well as being reflective and purposeful about which ideas they choose to try out and how they weave those new ideas into the instruction they already know works. Fred managed to use the instructional tools he developed in a multi-subject classroom to inform his work in a single-subject classroom, and continued to look for new resources in the form of books that his students could enjoy and connect to. Carla built on the knowledge and experience she developed around teaching grammar and short stories when she introduced ways to use technology to teach these concepts. Kent also sought out new ideas, but learned early on that he needed to have a firm grasp of the curriculum he

was teaching in order to really apply the new ideas he came across, such as concept maps. All three teachers based the use of new tools on their past experiences in a way that makes the use of these tools more purposeful and therefore more effective.

I also see how their past experiences seem to shape how they choose which new tools to use. Carla seems to be an especially clear example of this: there are a tremendous number of ideas and resources for teachers to access on the internet, and Carla would surely explore many of them knowing her curiosity. However, when it comes to deciding which ones she will try out in her classroom, she is more selective, and looks for things that can enhance what she is currently doing rather than simply looking for the newest and greatest thing. In this way I see her engaged in divergent thinking when considering her resources, but convergent thinking as she evaluates and critically analyzes these same options to see what best fits her knowledge about what works in the classroom. The knowledge and experience these teachers have informs not only the way they use new ideas but also the new ideas and tools that they choose to try out in their classroom. This suggests an element of strategic thinking that looks more like problem solving than simply trying out a new idea in a vacuum. In this case the "problem" might not be something negative. Instead, these teachers want to grow and improve their classroom, and they use their knowledge and experience, as well as the ideas they come across, to choose a direction for that improvement. They are open enough in their thinking to search for many new ideas and tools and are therefore engaged in divergent thinking. Once they have a sense of the options in front of them, they choose the ones to try out that best support the work they are doing, which is an example of convergent thinking. In this way I see these teachers using both convergent and divergent thinking to improve their instruction. Also, it is the knowledge they have, such as Fred's multi-subject experience or Kent's grounding in a curriculum, that allow them to make useful connections between their knowledge base and new ideas. In addition, when these teachers try out new ideas, they reflect on them and add this knowledge into their cognitive framework for future reference.

This means that these teachers are not only engaged in active problem solving when they try out new ideas, but that they are also adding to their knowledge-base.

While there are similarities in the processes these teachers engage in, there are also differences. All of them use their knowledge and experience to inform how they use the tools and ideas they come across, but Kent seems to be a bit more deliberate in choosing what new tools to seek out. Fred's and Carla's examples focus on finding tools to increase student engagement whereas Kent's use of concept maps points to his focus on developing the students' thinking skills as well as their understanding of the content. This makes me wonder about the differences in the questions these teachers are asking themselves, perhaps even on a subconscious level. While Fred and Carla may be asking themselves about how they can connect the content to their students lives, or use their students' interests to teach content, Kent seems to be asking himself "What instructional tools will help my students understand this concept?" If Kent was mostly worried about student connection to material, he might end up choosing to try new activities around physics principles instead of using a concept map. This is not to say that one focus is better or worse than the other. They all have their place and these are just small examples from teachers whose thinking is most definitely broader than what I have chosen to show here. What this shows is the importance of having a focus when a teacher tries out new ideas in the classroom. There is only so much time a teacher can spend both searching for new ideas and tools and then there is only so much time she/he can spend planning out ways to implement them in a class. The questions teachers ask themselves and the direction their thinking goes impacts what they choose to use and how they choose to use it, as we see with the differences between these three teachers' examples.

What I learn from these three teachers is that I need to stay open to new ideas and new tools, and that I also should consider how these tools fit into the instruction I know works. Having their use of divergent and convergent thinking as a model for me gives me the insight to ask questions such as "Why do I want to try this idea?" and "How does this tool connect with what I know works?" Their

experiences also show me that I will be selective about what I try out in my classroom, whether I do so intentionally or not, because I simply cannot use every new idea I come across.

These are three examples of teachers fitting tools into classroom structures in what might seem to be a seamless manner. In reality these changes, as well as other more drastic changes a teacher might make, can often impact other areas of a teachers' classroom. It is rarely the case that a teacher seamlessly weaves a new idea into an existing structure without having an impact, intended or otherwise, in other areas of their teaching. However, these somewhat simple snapshots of teacher thinking show some of the important thinking processes behind teachers integrating new ideas that are necessary to help explain the more complex thinking that teachers engage in when they take larger risks with new ideas. The insights and ideas from these teachers also provide a foundation that has allowed me to better understand my next topic: how teachers take and manage risks. These teachers have found ways to balance instructional strengths they know from experience with the application of new ideas, as well as how they add those new ideas into their knowledge-base. I have found that these factors need to be in place when teachers try out new ideas in the classroom that have an element of risk to them, if they are going to successfully manage the risk. To more fully explain this idea of risk-taking in the next chapter I discuss how Kent and Kevin (whom we have met already) as well as Allyson (whom we meet for the first time) try out new ideas in their classroom that add the element of the unknown. Just as Fred, Carla and Kent needed to find balance to integrate the old and new in a productive fashion, so too do teachers who take risks need to find ways to make the risks they take more likely to succeed for the students in front of them.

CHAPTER 5

RISK-TAKING: NAVIGATING THE COMPLEXITIES OF MANAGING RISK

The previous two chapters have focused on how teachers use their sense of purpose and divergent and convergent thinking to think through instructional dilemmas and integrate past experiences with new knowledge. Through these interviews it is also became apparent that these teachers use the same thinking processes to both take and manage risks in their classrooms. As I look back on my own experience teaching I see similar pattern. During my first semester teaching I vividly remember feeling like I was taking a huge risk every day just by showing up. Every lesson I tried was untested, and often it was something I had developed in a sleep-deprived stupor. By virtue of the fact that I was a brand new teacher, everything I tried was also new. I remember trying to have a class discussion about race and ethnicity and at the same time I was trying to teach my students how to write personal memoirs. Sometimes lessons like these had good results, but more often than not something went wrong. Although I did learn a lot from these risks and the mistakes and successes that resulted from them, I also rarely had adequate time, energy or experience to properly reflect and analyze what worked and what did not. Trying these ideas was not a complete waste of time, but I did not have the skills to optimally manage the risks I took.

Now, in my seventh year teaching, I still try new things in my class without knowing exactly what will happen. However, when I try new things now, it feels less like I am blindly throwing darts and more like I am taking calculated risks. Part of this is due to the fact that I have more experience, and therefore more tools, to work with. As discussed in the last chapter, teachers often build a personal library of lessons, activities and materials that they can reuse and adapt every year. I have these things, which also allow me to use and adapt new knowledge in a productive ways, as was also discussed in

the previous chapter. I could continue moving forward with this integration of new knowledge into my old ideas and I would still improve my teaching. However, in my own practice I have also seen huge benefits for both me and my students when I apply new ideas that are a bit risky although still informed by my experience.

What makes risk-taking different from simply trying something new is the element of the unknown. There are always unknowns in teaching; a teacher rarely knows what personal problems her/his students will bring to class, when a fire alarm might be pulled or who will even be in attendance. Teachers work hard to minimize the negative effects of these factors, but we cannot control everything. These unknowns are part of the reason I have sometimes avoided lessons or activities where I feel I cannot adequately predict the students' reactions, especially where touchy subjects are concerned. In many ways it is far easier for me to integrate my new ideas about developing kernel essays into my writing lessons than to have an open class discussion about the role of race in the 2008 presidential election, although they both are examples of integrating new ideas with past knowledge. What makes risk-taking stand out is the way that a teacher must accept and balance possible negative reactions of students with the potentially huge rewards.

Risk-taking that allows, or even creates, extra elements of the unknown can be extremely productive for both students and teachers. However, like many of the complexities in teaching, there are issues of balance inherent in taking risks. Taking risks every day, with almost every lesson, may not be very productive, as I found my first year. When conducting my interviews I noticed that the teachers almost all provided examples of some risks they took, but were able to explain how they thought through these choices and moderated the unknowns in a way that allowed them to both feel confident with their choices and also be open and ready to learn from the unknown factors they introduced. When listening to these teachers I became fascinated by both the questions they asked themselves before taking risks in the classroom, as well as the questions that they let the experience

answer for them. This chapter starts an example of a risk I took in my classroom around a class discussion, as well as how three other teachers took risks in a thoughtful and deliberate manner. The first teacher, Allyson, shares how she structures a potentially risky discussion in her social studies classroom. The second example shares how Kent's use of concept maps (initially described in Chapter 4) also represents a managed risk. Finally, Annie (whom we met in Chapter 3) shares how the risk of asking for students input can pay off when reading a complex text. With the exception of one (Allyson) the examples are from teachers I discussed previously, highlighting the way that a teacher's risk taking can be productively connected to their integration of old knowledge to new and their understanding of balancing instructional methods and tools.

My Story: Diabetes and a Class Discussion

One of the many ways I look for new ideas and inspirations for my own teaching is in the education journals I subscribe to. This school year I read an article entitled "Saving Marvin Sweettooth" that detailed a teacher's experience leading her students in a structured discussion about the rise in type II diabetes among teenagers, especially teenagers in urban areas (O'Grady, 2010). This story described both a topic and a discussion structure I was interested in. Additionally, I read this article at the same time that my 10th grade colleagues and I were planning to teach a unit using non-fiction texts to our English classes. I shared the article with my colleagues, and we decided to go ahead and try to adapt the ideas for our own classrooms.

The teacher who wrote this article had described a discussion her students had around a fictional character named "Marvin Sweettooth" - a young teenager who had developed type II diabetes (O' Grady, 2010). This teacher had also created a number of other characters, such as Marvin's mother, his gym teacher, the CEO of a fast food chain, etc. who all played a part in Marvin's illness. Each student was assigned a character, and they had to read articles about teen health and diabetes that would give

them information that they would then be able to use in the discussion about diabetes. The teacher also divided the discussion into four "rounds": the first where the characters described their situation and what led them there, the second where the characters each blamed someone else for Marvin's plight, the third where the characters discussed and tried to decide on a way for Marvin to manage his diabetes and a fourth where the characters tried to figure out a way to prevent Marvin's younger sister from developing this disease.

When I encountered this article, I was attracted to the teacher's discussion methods because I saw them as ways I could achieve the goals I had for my students. I wanted my students to read non-fiction with a purpose, and if they were characters with a certain perspective that would give them a legitimate lens through which to read articles about teen health issues. I also thought that using discussion rounds would help solve some of the concerns that had prevented me from having student discussions previously. In my class I had students who were only in their second year in an English-speaking school and struggled to speak in front of a group as well as students who had been on debate teams. In order to both challenge but also support all of them I needed the different discussion structures that this teacher provided. My students who needed more support could participate in the first round where there was more opportunity to practice and rehearse what they would say, while my students who needed to be challenged more could participate in one of the other rounds where they needed to be able to debate and think on their feet. Also, I created a corresponding writing assignment so that all students not only developed their argumentative speaking skills, but had an opportunity to show their argumentative thinking in writing.

After completing this unit it was obvious that, before I tried this again, there were many improvements that needed to be made. The texts I used did not provide all the necessary background information about the issue of diabetes and teen health, and I clearly saw in the discussion that students needed to learn how to take quick notes while in the midst of the discussion, so as to better respond to

the other speakers rather than simply rattling off their own points. There were also significant successes. More students were reading and understanding non-fiction articles independently at the end of the unit than had done so at the start, and several students who rarely participated in class became very engaged with their character and their preparation and performance in the discussion. Upon reflection, I learned a lot from this experience that will be used to improve how I teach this unit next school year.

In some ways implementing this unit was similar to the learning experience described in Chapter 4, when I learned about kernel essays and integrated them into my writing instruction. In both cases an idea from an education text inspired my instruction. In both cases I adjusted the ideas as necessary for my class and applied them knowing that I would make mistakes and learn from the process. However, I definitely felt that my application of the Marvin Sweettooth discussion was far riskier than using kernel essays. When it came to using kernel essays, I could be fairly certain about what students would produce, especially given sentence starters. Also, if students' writing surprised me, I had space to re-do the lesson and steer them in a new direction. This was not the case with the Marvin Sweettooth discussion. At the heart of that activity was the fact that students were having the discussion in real time, and if things went drastically wrong, or differently than I might anticipate, there was no easy opportunity to re-do the discussion. Also, I was using new texts and teaching a non-fiction unit for the first time as well. I did moderate these risks by using the structures that the teacher in the article described, such as the discussion rounds. In addition to this, I created resources to help guide students, such as handouts that helped them prepare their opening arguments and consider what some counter-arguments might be. This helped create a situation where the discussion could have a more reasonable chance of success – at least far more of a chance than the discussions I lead my first year where I threw out a question to my students and just hoped they would respond. In contrast, during the Marvin Sweettooth discussion students engaged in more active thinking because of the unknowns

involved. I stayed open to the many arguments and ideas students had, even if they were arguments and ideas I had not thought of. In fact, some of my students developed a more sophisticated view of how the economic and political structures can impact personal decision making than I had previously considered. What allowed this to happen was the risk I took in letting students develop and discuss their own ideas through the voices of their characters. In this case, and in the next three cases, risk-taking not only demonstrates a teacher's ability to think through many complexities of teaching, but also often leads to students' doing more critical and creative thinking precisely because the teacher is.

Allyson: Managing Risks in Discussion

Allyson is a teacher in her sixth year teaching middle school in a moderately sized suburban school district where she teaches ancient civilizations to a diverse group of seventh graders.

During our interview Allyson would often pause and think carefully before answering a question, and she seemed to be very aware of her own thinking process. As a social studies teacher whose grade level focus is on ancient civilizations, such as the Roman Empire and the ancient Israelites, she explained how she struggled to fit issues such as current events, civic action and global awareness into her class during her first few years. However, as she has grown as a teacher, she has developed systems for her class that allow her to integrate these issues with her standard curriculum. She now approaches planning for each unit by starting with the standards and content she must teach and investigating global issues and current events that are connected to this content. For example, when her class studies the ancient Israelites they also discuss the current conflict between Israel and Palestine.

In addition to strengthening her ability to integrate these aspects of her class over time, Allyson has also gained a better sense about how students react to a variety of situations and assignments. This stronger sense has been partially developed by Allyson learning form her mistakes. One such

experience was the time she was able to get a former lost boy of Sudan to come speak to her class after they studied this topic. When the speaker was in her class her students misbehaved in part due to boredom. What Allyson learned from that was that she needed to really prepare her students for discussions or presentations like this by providing them with the full context of the situation. She recognized that she, as an adult, had a broader perspective about the issue, which is why the speaker was so engrossing for her. As a teacher, she needed to foster both that same depth of knowledge and interest for her students to fully benefit from such events.

Allyson has also learned to anticipate her students' reactions about other topics as well, especially some that might hit close to home with her students. For example, when she shares statistics about some of the home countries of her students, such as the infant mortality rate in Haiti, she is aware that some of them will probably react angrily to negative statistics, especially since those statistics may not match their own experience in their country. Allyson knows this and strives to strike a balance between honoring her students' experiences but also recognizing that the statistics, while general, do tell part of the story. Allyson mentioned that she would not have touched some of these issues "with a ten foot pole" her first few years, but now she realizes that dealing with these issues are not an all or nothing proposition, and she has developed the skills to manage these risky discussions. By being aware of how her students might react based on how students in the past have reacted, she is able to better teach and share the knowledge her students need.

However, the first time Allyson brought up these issues she was taking a risk. She could have chosen to stay focused on the standards about ancient civilizations or simply integrated new lesson ideas about how to teach those standards as her main focus of growth as a teacher. Instead, she decided to find a way to introduce global issues and civic awareness to her students, which involves more risk. One of the ways that Allyson has done this is through discussion. Her experience teaching has helped her, in her words, "anticipate a lot more what questions and what push back I will get from kids."

When Allyson has a discussion in her class she starts by producing a list of questions that she hopes will encourage exploration about the topic at hand, be it how the Ancient Greeks used resources or how the clean water is provided in different countries around the world. She provides this list of questions to the students and tells them that these questions are a guide, but that they are also the anchor that will help focus the discussion. Allyson describes this list of questions as a "box" for the discussion, which allows for flexibility within the parameters set by the questions. While she may not know exactly what students will say in response to these questions, she can anticipate the direction of the conversation. Through all of this Allyson still remains very open to different responses students might have.

What has allowed Allyson to be prepared in this manner is a combination of her experience and her thoughts and reflections about that experience. She has led discussions that have gone well and have gone poorly, both of which have prepared her for what types of responses to expect and what types of questions to ask. She is also knowledgeable enough about these topics that she will be able to answer most of their questions and she has the confidence to tell her students when she does not know the answer to one of their questions. Allyson describes this whole discussion process as a box. She creates the parameters, such as the questions and the content she teaches before the discussion, that are like the borders of the box. She is comfortable with leaving the inside of the box as the unknown. She never knows exactly how the discussion is going to go, but she manages the risk so that it is both more likely to be productive for the students and so that she can have something specific to reflect on to learn from.

Allyson is not content to simply stick with topics and instructional methods that are safe and that minimize the unknown. She sees the benefits of having discussions about topical and often sensitive topics with her students. Through her experience she has learned ways to make these discussions more productive by fully preparing her students with the knowledge they need to understand the topic, and by always being prepared with many questions. Although she has learned to

manage this, she still is willing to take the risk of opening up the classroom to student responses that she can never fully predict. In this way her past experience, as well as her new knowledge is being used not only to improve her instruction but also to help her create a "box" that helps her manage the to calculated risks she takes.

Kent: Managing Risk in Student Thinking

Kent, who was introduced in Chapter 4, is a physics teacher in a small (400 student) high school located in a large urban school district. He has taught physics for 7 years. As a result of his experience student teaching, he was one of several teachers who piloted a curriculum entitled "Active Physics" during his first year of teaching. This program was designed to make physics more accessible to a great number of students using principles of discovery learning. In addition to these roles Kent served as the science department head for several years.

Kent, is, like Allyson, is a mid-career teacher in his seventh year. Chapter 4 discussed how Kent integrated his use of concept maps into his classroom as an example of integrating new knowledge with previous experience. In this case, Kent's experience is not only an example of that integration, but is also an example of risk-taking. In fact, Kent's use of concept maps is a great example of how experience allows a teacher to take risks and deal with the unknown with a structure that helps manage the risks.

As discussed in Chapter 4, Kent learned about concept maps (which are diagrams to show the relationship among concepts) in graduate school and wanted to use them in his classroom. These maps are very complicated ways of showing the relationships between concepts. When I first looked at one, I was overwhelmed by the many arrows pointing in different directions among many boxes. As discussed previously, Kent saw the concept map as a way to get students to see the relationship between details in physics, something that he struggled to teach them but that also thought was vitally

important for them to learn.

However, the concept map is, in some ways, a double-edged sword. It relies on students to find the relationships between ideas on their own to some degree in order for it to be useful and represent authentic inquiry learning. While the potential exists for students to find novel and interesting new connections between ideas, the potential also exists for students to grossly mis-represent relationships in a way that confuses their understanding. These concept maps were not simply new ideas or new tools that would be used to aid in teaching the same basic content. For Kent's students they would be a very new way of thinking about physics, and therefore unknowns existed for Kent.

Despite this Kent went ahead and used the concept maps and learned a lot from their use. He did not do this blindly; instead he was able to use his experiences and knowledge to create a framework for managing the risk he was taking. Like the "box" Allyson describes, Kent set up parameters to support his students as they used this new tool. He knew that students need to start out exploring the concept, and he has learned to anticipate the points in the unit where his students will need him to slow down and use direct teaching to explain certain points. By using this knowledge to set up his students' content knowledge, he is preparing them to be able to fully utilize the concept map as a learning tool. As Kent explains, for a student to be able to complete a concept map, they really need to understand what was going on with the content. In theory, being asked to complete a concept map should force the students to go back and figure out what they may not fully understand, using their notes and other records Kent has them take to track their learning such as handouts and lab notebooks. By structuring these records of their learning Kent created the structure his students needed to have in order to complete a concept map. In this way Kent attempts to use the concept maps as a way for students to come full circle and critically think about the course material.

Kent's use of the concept maps improved over time, and now he also uses them as one part of a three-part assessment system that includes an exam and project at the end of each term. As he

continues to adapt these concepts maps every year he is not taking as much risk because he knows more about what to expect. Yet the first time he used them they represented a significant shift in the way things were done in his class, which meant he did not have direct experience to rely on. The use of these maps also represented a risk because they introduced the element of the unknown. The concept maps rely on students' sorting out ideas in a way that makes sense to them; that is where quite a bit of the learning happens. This also means that the teacher cannot be absolutely sure of what a student will produce. A student could conceivably make a map that initially made little sense to the teacher, but with explanation the teacher could see if the student had a different understanding of the material that was meaningful to the student. By using a tool to push his students' thinking, Kent is allowing for the risk and potential reward that comes from him and his students encountering something new. However, he did use his previous knowledge and experience to manage the risk he was taking, by using note-taking, and lab notebook, systems and lessons designed to build his students' conceptual knowledge.

Kent's willingness to take risks resulted in a more authentic assessment and powerful learning tool that he uses in his class to this day. This example shows how allowing for unknowns in a classroom can be productive, especially when these risks are managed using a teacher's experience.

Annie: Managing Risks in Student Reading

Annie has taught in a large urban school district for 6 years. She has taught at both large traditional high schools as well as smaller schools and has taught grades 9^{th}-12^{th} in both English Language Arts and English as a Second Language.

Annie was introduced in Chapter 3 in the context of discussing how she negotiated a balance between content and skills in her classroom. Like Kent, this is not just an example of Annie navigating the complexities in instruction, but also shows the way she is taking managed risks. When Annie

taught *To Kill a Mockingbird* she analyzed the book herself and decided she wanted her students to learn the importance of the narrator and then designed her lessons to support student skill development regarding this factor in the text. The instructional methods that Annie used to do this not only helped her further these goals, but were also an example of risk-taking. In order to have her students understand the importance of the narrator, Annie had them read like anthropologists. This meant that while they read the book she had students record what the narrator, in this case the child Scout, was learning about the town of Maycomb. Students kept these records on handouts Annie made and shared them with their groups. As the students continued to record what Scout was sharing, Annie asked them to explain what they noticed about what Scout was both learning about Maycomb and therefore what the author was choosing to reveal. Students had various responses to this question. Some noticed that Scout seemed oblivious to the reason why there were differences in social statuses between different groups of people in the town, although she went along with them because she did not know better. Other students noticed things that seemed more basic, like that the town was mostly racist, or that Scout and her brother were adventurous. However, Annie was rewarded one day when one of her students explained how he noticed that as Scout learned things about her town, he, the reader, was learning them to. He explained how this put the reader in the position of learning like a child while reading this book. Sparked by this comment, students were able to have a very interesting discussion about why the author would set up the book this way and how the reader might feel differently about the town, especially the racist members of the town, if they were to learn about it from an adult's perspective rather than a child's.

When Annie chose to use these methods of recording ideas while reading and of open discussion in her classroom, she was taking a risk the way any teacher is when they ask for the students' thoughts and opinions. A teacher never knows quite what students are going to notice or say, and if there are certain things they want them to notice or say, it is often tempting to just tell the

students what you want them to know. Indeed, Annie could have chosen that instructional route when she decided that she wanted her students to learn about the importance of the narrator in a text and then lectured about it. Instead, Annie not only wanted her students to learn the content, but she also wanted them to develop the thinking and reading skills that would help them learn to notice authors' choices about things like the narrator. I can attest to the fact that my high school students often see texts as creations in a void, or created by some god-like creature we call an author, and they often seem to forget that the author wrote the text and made choices about what to include or not include. Annie was aware of this, and so she took an instructional risk in hopes that her students would arrive at the understanding that authors make choices about texts. She assumed by teaching this central idea in this way, through guided discovery, it would be more enduring, memorable, and real, rather than if she simply told them this, as they had presumably been told before by numerous teachers.

All of this is not to say that Annie did nothing to help her students arrive at this understanding. Annie explained that she was setting up a structure that provides her students with a good chance of developing the skills and ideas she wants them to have. She sees it as a structure made of blocks, similar to Allyson's vision of a box. She wants the students to do some critical thinking at a higher level, but she realizes that requires her to provide some of the foundational blocks that will allow them to do this, without just giving them the answers and even keeping herself open to student realizations that she had not even considered. Therefore, she decided to take the risk of asking students to record what *they* notice and search for *their own* patterns. However, she provided them handouts with sentences starters to do this, which pushed students to notice things that are a bit more reveling and abstract rather than simple things. She also had students record a lot of these ideas share them with each other, so that students could more easily identify interesting patterns. She also was prepared for the discussion and ready to ask follow-up questions that could help lead students to develop more critical and interesting realizations. By providing these structures Annie set up a situation where her

students could come up with ideas and develop their thinking skills while she supported them. By taking the risk of not quite knowing what students would notice, but also structuring parameters of the situation so that students were more likely to be successful, Annie was able to help her students improve their thinking at the same time that they arrived at a stronger understanding of the content than they likely would have if she had simply told them what she wanted them to know.

Reflection

The concept of "adaptive expert" is readily apparent in all these examples, but perhaps most so when considering how teachers take risks. It was Allyson's description of the box she used to manage the risk she took with student discussions that really helps show the role of managed risk-taking in teacher development. As explained in the previous two chapters, when teachers decide which instructional tools and methods to use, and when they integrate their past experience with new ideas they are engaged in a complex thinking process. This process, among other things, involves using a convergent and divergent thinking cycle to find creative solutions to the problems or dilemmas these teachers face. This is all fine and good, but adaptive experts are experts that not only think like experts, but who are always searching for a better way of doing things, and are constantly learning and seeking new knowledge. When these teachers took risks, they, like adaptive experts, learned more and became better at what they do. Risk-taking is the vehicle that not only teaches them new ways of doing things, but also develops and strengthens their "teacher" thinking skills through deliberate practice.

In the literature on experts, there is much discussion around the idea of "deliberate practice." Ericsson, Krampe and Tesch-Romer (1993) identified several key characteristics of deliberate practice, including the facts that the individual practicing must be attending to the task, "exert[ing] effort to improve performance" and perform similar tasks repeatedly (p. 367). Additionally, in order to be effective, the person engaged in the deliberate practice must receive and integrate immediate feedback,

and the task itself should take into account what the individual already knows and challenge them enough that they will improve as a result of the practice. There are ways that these teachers are engaged in the deliberate practice of both problem solving and risk-taking. Each of these teachers faced a problem they needed to solve, be it how to get their students to have productive discussions, make meaningful concept maps, or really understand the role of narrator in a text, which required them to integrate their knowledge base with instructional methods. However, by taking a risk that involved trying an idea that they were not certain would work, or indeed, *how* it would work, these teachers were deliberately moving beyond what they knew and creating a learning opportunity.

In addition to these risks pushing the teachers to learn and practice new aspects of their craft, it also gave them an opportunity to engage in focused practice of thinking like adaptive experts. These teachers all had to think through, and therefore pay attention to, the options they had before they took their risks, whether it was considering what questions to ask during a discussion or looking at a number of ways of organizing information within a concept map. When they were doing this, they were not only engaged in divergent thinking, but were actively practicing being divergent thinkers. When I am considering trying something new in my classroom, I now pay more attention to my options and am also more metacognitive about my process. These teachers were also more attentive and metacognitive in their divergent and convergent thinking when they were considering what to do in their classroom because they were considering trying something new.

Taking risks not only pushes teachers to pay more attention to their thinking, but also provides more opportunities for divergent and convergent problem solving. In Allyson's example, she considered the many possible reactions her students might have to a topic before crafting her discussion questions, and even then, she works hard to remain open to other possible responses that might come up. In Annie's example she considered both the many aspects of *To Kill a Mockingbird* she could focus on and the many reading strategies she could use to help students understand these aspects.

Additionally, in the act of managing these risks these teachers continue to engage in this type of problem solving by both convergent thinking to evaluate and select which tools to use; they then used the divergent/convergent thinking process again to imagine possible student responses to their approach and craft a "box" that would allow them to manage these potential responses and give the students the best possible opportunity for success.

By engaging in this deliberate thinking process when trying something that is somewhat risky, these teachers are not only improving their ability to think like experts, but are also adding to their knowledge base. They learn from these risks and then build on that experience. After seeing what his students produced in the concept maps Kent saw how they could become part of his assessment system. Once she saw how her students reacted when they lacked the context to understand a speaker, Allyson figured out ways to set her students up for more intellectual discussions and interactions in the future. All of this adds to these teachers' knowledge in a way that allows them to take productive new risks in the future.

Additionally, the ability to learn from risks in this way also speaks to the way these teachers have managed these risks. As I found my first year teaching, just because I am taking a lot of risks does not necessarily mean that I am being effective or even learning as much as I could. By applying their experience in a constructive way and integrating it with the new ideas they were trying, the teachers in this chapter were taking risks that helped them learn, and that also had a good chance of leading to success in the classroom. As a teacher I appreciate seeing this, because it helped me think about how I can be more selective and more deliberate about the risks I take in my own classroom.

One final observation is worth noting. Although the teachers shaped their instruction differently, all were taking a risk by opening up their classroom to a myriad of possible student responses. At some level, for all of them, a large part of the risk was introducing the element of student choice. It is fascinating that, as these teachers challenge themselves intellectually by engaging in a

complex problem solving process, they are asking their students to become just as engaged in their thinking, whether it is about physics concepts or how clean water is distributed in our world. There is the hint of an important connection here. Is their own willingness to think deeply connected to their desire to see their students think deeply? Does this possibly mean that making deep teacher thinking transparent not only serves teachers who want to improve, but could also be a vehicle for encouraging the development of student thought as well? Speaking just for myself, these examples inspire me to be more metacognitive and focused on my own problem solving and also open to the possibility that my more effortful thinking practice will help me figure out how to get my students to practice similar critical and creative thought.

CHAPTER 6

CONCLUSION

When reading about the eight teachers discussed here (my seven interviews and myself) it should be apparent that these teachers, with all their sophisticated thinking, are not anomalies or superheroes. Also, although it is not explored in depth here, these teachers readily shared their flaws and the errors they had made during the course of our interviews. While some of these were selected in order to show how these teachers learned from these mistakes, there were many more of their flawed experiences that did not make the cut for lack of space or context. While not every teacher thinks like these teachers, every teacher has the capacity to develop their ability to think like them: asking thoughtful questions which drive them to use divergent and convergent thinking to solve problems, and to reflect thoughtfully on their work. In fact, I suspect that there are more teachers in the field of education who that think this way than others might realize. Unfortunately, bad teachers, the ones who do not seem to care, or who are burned out, often stand out more in the public consciousness. However, the teachers I interviewed, although not a representative sample of the population of secondary teachers, are, like the majority of teachers I have met in my own teaching experience. In concluding, I will discuss both what I have learned from this synthesis project as well as what further questions remain to be explored.

Lessons Learned

This project began by my asking what types of thinking processes thoughtful teachers engaged in both as they developed and improved their teaching practice, and whether there were commonalities in their thinking process. Completing and analyzing the interviews of these seven teachers helped me

start to answer these questions and also provided some new insights.

First, these teachers provided many concrete examples of how to navigate the complexities of teaching. It is one thing to say that teachers should keep their minds "open" or consider all their options before arriving at a decision. It is another to see that thinking in action, especially considering the real-world constraints of a teacher's job. In these examples these teachers showed how their own thinking processes were as much a factor in their improvement as any outside resources. They also showed how the *way* one learns from and thinks about new ideas is as important, or perhaps even more so, than the ideas themselves. As Chapter 4 showed more specifically, these teachers were able to make useful connections and effectively integrate new ideas into their practice by thinking through the connections between their current way of doing things and new ways of doing things; they did not simply implement the newest idea independent of prior experience or eschew new ideas in favor of doing things the same way they had done them before.

Second, before starting this project, I had not clearly seen teaching through the lens of problem solving. I did assume that teachers were engaged in some useful thinking processes that helped them navigate the many complexities in teaching simply because I had faced many of those complexities and did not believe someone could stay in this field for more than a couple years *without* developing some kind of method for dealing with these complexities and tensions. When looking for commonalities across these teachers' experiences, this notion of problem solving seemed to emerge. In these cases a "problem" does not necessarily indicate a deficiency, but represents an issue or question worthy of exploration. With that understanding, we can see how these teachers were problem solving constantly as issues came up, such as the choices Annie and Kevin had to make about instructional strategies and the way Allyson dealt with class discussions.

Third, in addition to their problem solving abilities, these teachers all sought out new ideas and new ways of thinking. They did not remain locked up in one way of doing things. They were

simultaneously open enough to seek out new ideas and unique connections, while also being focused enough to analyze and evaluate the choices they had within the parameters of the real-world classroom, much as Allyson had to structure a discussion or Fred had to apply his old way of teaching to his new classroom. One understanding to take away from this is that navigating the complexities of teaching is not a linear process of being open, then focused. Instead it is about almost simultaneously moving back and forth between divergent and convergent thinking in the search for novel solutions to some of these complexities that teachers face. Although this is only a piece of the thinking processes these teachers are engaged in, it is a piece that has transformed how I see my craft and will transform how I think through the teaching complexities I face in the future.

Another question that launched this project was the question of how teachers moved from being novices to experts. I assumed early on that the thinking processes they engaged in were a crucial factor in their growth and development as a teacher. When looking at how these teachers thought, especially how they tried out new ideas and integrated them into their current knowledge base, it was clear that they were developing both the cognitive framework for storing new information in the ways that were more expert-like (i.e. focused more on deeper student interaction patterns than superficial features), and also engaging in the deliberate practice of thinking like experts. Going back to Robbie Cases's three types of schemata, when these teachers navigated the complexities of teaching, be it developing better instructional strategies or trying out new tools such as concept maps or grammar games, they were engaging the executive schemata involved in "flexible" and "complex thinking" that led to "novel transformations" where the teachers integrated their ideas with their classroom practice (Cropley, 2001, p. 31). When these teachers shared with me how their thinking had developed over time, and how they learned from their mistakes, it became apparent that this engagement of their executive schemata served a dual purpose. In the short term, it helped these teachers develop creative solutions to the "problems" they were sorting out. In the long term, this repetitive use of the executive schemata, as

well as the figural and operational to problem-solve, meant that every time they did so, these teachers got to be more efficient and better thinkers. Kent is an example of this: one of his early experiences as a teacher involved developing adaptations to the "Active Physics" curriculum, which required thinking creatively about how to adjust what he was doing based on student responses to the existing curriculum. However, when he introduced concept maps, he was taking a very complicated tool and applying it to his already complex teaching approach focused on discovery learning. Through this experience he was constantly thinking about additional ways to use the concept maps, which resulted in the maps becoming part of his assessment system. Part of the reason he was able to think this way about the concept maps was because he had practiced this type of thinking in other areas, such as adapting his curriculum, *and* because he had added enough knowledge and experience to his cognitive framework that focused on "big ideas" so that he was able to rapidly make the relevant connections.

While these factors are a large part of how teachers like Kent and the others I interviewed are building the cognitive framework and thinking abilities of experts, what really describes them is the concept of adaptive experts. When these teachers think through a complexity they face in teaching, they are engaged in critical and creative thinking and are seeking out new ideas and asking many questions because they want to improve, learn more and get better. It is this drive and motivation that seems to be at the core of what makes them improve. This drive to improve, coupled with their willingness and ability, based on their experience, to think critically and creatively about the complexities of teaching, make these teachers, if not true experts, embody the role of adaptive experts in their field.

When considering what else can be learned from these teachers, something else that stands out is their engagement with the tension between structure and openness. As a teacher I often struggle with this tension myself. There are structures in place in my classroom that I must work with: some of my own making and some outside of my control. Like these teachers, I want to be open to new ideas and

even new instructional goals, but, also like these teachers, there are structures that exist for good reasons that I need to work with or else I will face the issue of trying to do too many new things without keeping and using what works. Something I have learned from these teachers is that keeping purpose at the forefront of my mind might very well be the way I and other teachers can think through this tension. When Carla considered how to work new instructional tools into the structure of her classroom, she kept her students' learning objectives regarding grammar and short stories in mind. This allowed her to better sort through the many ideas and tools she came across on her internet searches. When Kevin was trying to figure out the optimal instructional methods for his students he kept in mind his ultimate purposes: the specific thinking, writing and reading skills he expected his students to learn. By keeping these purposes in mind these teachers have something that keeps them both grounded in the necessary structures but also driven to be open to new ways of doing things so as to better achieve these objectives.

I have always considered myself to be a purpose-driven teacher. I set objectives early on in the year, and these objectives structure where I spend my time. I always saw this purpose-driven perspective as a way for me to stay focused and to avoid getting distracted by novelties. However, now as I examine these teachers' thinking, I believe that my view of purpose was too limited. While I do need to stay focused on my purpose to keep from taking myself and my students off-track, this same purpose can drive me to seek out new ways of doing things, and push me to be open to the new ideas and connections I make from what I learn. For example, this coming school year when I set the goal for my students to be able to read and analyze three different non-fiction texts about the same topic and then write a synthesis essay about them, I will use that purpose to not only keep myself focused on the goal, but also to drive me to look at different forms of synthesis essays or to consider a multitude of non-fiction texts to use, rather than the ones I used last year. If there is one thing I learned from these teachers it is this purpose-driven perspective can actually help me be more open in my thinking as I

attempt to grow and improve as an educator.

Future Directions

While this work is not as objective or scientific as a more traditional research project might be, it has been illuminating to me as a teacher and has also raised questions that could lead to a more extensive investigation. For example, it would be interesting to see if these findings about the ways teachers engaged in purpose-driven problem solving using cycles for divergent and convergent thinking could be replicated with a larger sample of randomly selected teachers, or with think-alouds with teachers as they view classroom video or actively solve problems. Also, divergent and convergent thinking were just a couple of the thinking processes these teachers were engaged in. These teachers exhibited many other thinking processes and dispositions that could be further studied both to see patterns as well as the effect of this thinking on other teachers. In addition, one could broaden the range of types of teachers interviewed. I interviewed only secondary, single-subject teachers, but it would be fascinating to see both the differences and similarities between the thinking of elementary teachers, art teachers, professors at colleges and universities, etc.

Another area for further study involves considering the issue of teachers learning from other teachers. There is significant work in educational research that has been done around exploring the benefits of teachers working with and engaged in critical discussions with other teachers. Some of the applications of these findings, such as critical friends groups (Dunne, Faith, Nave & Lewis, 2000) or professional learning communities (Dufour, & Eaker, 1998) have involved teachers sharing their thinking with others along with fellow teachers asking questions to push each other's thinking. Part of the goal in writing this piece has been to expose the reader to the thinking of teachers much in the same way I was exposed to the thinking of my colleagues through both formal and informal conversations with them during my career, because I think that is one of the most effective ways to help teachers

improve in their craft. My work could inform future work that studies the impact of teacher learning communities by providing insight about what they could investigate as factors in teacher learning.

I currently work in a school where I am lucky enough to be given common planning time with some exceptional colleagues and my time and work with them has greatly enhanced my teaching. However, if we as a nation are serious about improving our education system, and therefore the teachers in it, we need to be serious about giving these teachers time to examine both their own thinking and to share their thinking with each other. Kent shared with me a conundrum that I have also grappled with when he explained how he sometimes struggled to apply new ideas or improvements because he simply lacked the time to plan for them accordingly. Like any profession, teaching faces constraints of time; we have many students in front of us that we need to educate. However, as the current presidential administration, as well as states, districts and even schools, look to revamp our school system for the twenty-first century, it appears that finding creative solutions to give teachers time to think and share their thinking with other teachers may be an important part of this process, which is presently overlooked. This work shows the vital importance of teacher thinking in regards to teachers' development and continued teacher improvement. If we can see and more fully understand the importance of teachers developing their thinking processes and using these thinking processes to navigate the complexities of teaching, I suspect that we will not only improve our teachers and their teaching, but also our students' thinking as well.

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APPENDIX A

This is the letter that was given to the teachers I interviewed. In addition to discussing how the interview would be used, it contains the questions that provided the structure for the interview.

Dear Teacher,

Thank you so much for considering being interviewed for my writing project. I am currently working on writing descriptions about how teachers learn and think in an attempt to find patterns of thinking that can provide novice and second-stage teachers some ways of thinking through their own teaching experiences. As part of this process I am interviewing teachers about their professional and personal development in education. My interviews have been as varied as the teachers I have spoken to, but here are some of the questions I will ask during an interview:

a. How have you developed as a teacher during your teacher career?
b. How do you decide what to teach and how to teach it?
c. How do you reflect on your teaching? What does that actually look like and what purpose does it serve in your teaching
d. What parts of teaching do you love? Which parts do you hate?
e. How do you attempt to balance your work like with your personal (non-work) life?
f. What is a metaphor you would use for teaching (extra question – for fun if we have time – it has sparked some interesting discussions though!)

Some important things you should know about what I will (and will not) do with what you say in our interview:

- Any reference to you, in anything I write (whether it is shown to others or not) will contain a pseudonym.
- I will submit anything I write to you to read over and comment on before I submit it to any publisher.
- I would like to be able to share some of the notes from our interview with a group of four fellow students working on synthesis projects. Any identifying characteristics (such as your name, age, employer, etc.) will not be discussed or used.
- If you have anything you don't want me to record, write down or use, please just let me know – it will be off the record, no questions asked.

I hope these questions and clarifications don't sound too intense. I really have enjoyed the interviews I have done so far – they have introduced me to a wide range of views on teaching and learning that I have found beneficial and that I think other teachers would as well. If you would consider being interviewed for this project, please e-mail me a mleveypabst@gmail.com or call me at 510-717-4808.

Thanks!
Marie

APPENDIX B

Example of a Concept Map