Finding the "Royal Road" to Learning to Teach:
Listening to Novice Teacher Voices in Order to Improve the Effectiveness of Teacher Education

By Catherine Snyder

Introduction

Adults learn differently than children or adolescents (Brookfield, 1986; Dewey, 1938; Kegan, 1994; Kolb, 1984; Mezirow, 2000). A thorough understanding of how adults learn is imperative to the successful education of adults. It is only by understanding the unique ways in which adults learn that the academy can create environments where adults learn and thrive. One area of adult education which has been inundated with criticism is teacher education. It is in this field that I chose to investigate adult learning in order to identify what is important to adult learners in their journey toward becoming successful teachers. The study results identify elements of learning of central importance to adults striving to be highly effective classroom teachers. These elements, if applied to teacher education, have the potential to improve how future teachers are taught.

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My own experience with adult learners has been guided by these theories of adult learning. I have noted that adults approach new learning with a more intense need and amplified emotional state compared to other age groups. Over the course of my career, I have taught early and late adolescents as well as adults. The differences in how these different age groups learn and

how they react to learning is striking. The primary reason for this research was to gain a better understanding of how adults learn and then to share that understanding with teacher educators. Those of us in teacher education are often subsumed by the content we teach our students; that is, how children and adolescents learn. In that context, it is easy to forget that while our curriculum focuses on childhood learning, we are teaching adults. This study, therefore, specifically targets the adult participants' transformations from a teacher education program into careers as secondary teachers. The purpose is to determine what adults identify as relevant to learning so that it can be used to improve the effectiveness of teacher education.

This line of inquiry has become particularly important in recent years as teachers and teacher education come under attack. One commonly pointed to solution is fast tracking professionals from other fields into the classroom. The general assumption is that if a professional, a scientist, for example, has the content knowledge and willingness to teach adolescents science, an unfettered pathway into the classroom should be made possible. While there are certainly many professionals who have the innate skills necessary to teach, there are many more who have the potential to become excellent teachers with proper training. This research study supports the notion that career-changers come to the classroom with a wealth of skills and talents to offer our youth, but at the same time require a specific kind of attention and learning from professional teacher educators (Holt & Unruh, 2010). Without this attention and learning, people interested in teaching will continue to enter and exit the profession at high rates; serving only to expend valuable resources and contribute to the national, and negative, conversation on the failures of teacher education.

Theoretical Framework

Mezirow's transformative learning theory purports that achieving transformation allows an individual an integrative, highly tolerant, broad and porous way of knowing only possible within the context of communicative action (i.e., discourse outside the realm of instrumentalism and/or coercion) (Mezirow, 1991). Mezirow's theory posits that adults learn differently than children and adolescents because as adults mature, they accumulate experiences which combine to validate increasingly complex frames of reference. This finding stems from research Mezirow conducted with women entering community colleges in the 1970s (Mezirow, 1978). Through this large scale qualitative research, Mezirow observed that certain learning characteristics exhibited by the women returning to school were generally observable across the population. These observations, validated in subsequent studies, evolved into transformative learning theory. Mezirow states that adults develop frames of reference that are continually used to make sense of the world in which we live. With repeated testing over time, those frames of reference become reliable, and perspective transformations become less likely (Mezirow, 1991). The sheer accumulation of experiences adults collect cause them to think and learn differently than children or

adolescents (Kolb, 1984; Merriam, 2004). According to Mezirow, this accumulation of experiences and establishment of reliable frames of reference cause adults to be more thoughtful, and even cautious in their approach to new learning. Adults seek to fit new learning into pre-existing frames of reference. When new learning does not fit, opportunities for perspective transformation emerge (Mezirow, 1978). Adults will transform their thinking when old paradigms of thought no longer remain reliable for interpreting the world around them. Mezirow calls these new, more integrative ways of knowing "perspective transformation" (Mezirow, 1991, p. 167). A key element of perspective transformation is evidence of changes in decision making as a result of new understandings. The ten phases of transformative learning theory (see below) allowed for a tracking of participant growth which in turn helped identify the characteristics necessary for the participants' successful transition to secondary teaching. Transformative learning theory framed the research presented here in that adults were viewed as approaching new learning with a critical eye, vetting new learning through the lens of experience. With this in mind, instructional techniques that prompted a more integrative or different view of teaching were paid close attention, resulting in the findings reported in this study.

Ten phases of transformative learning make up the framework for Mezirow's theory and the analytical tool for this research. Since the publication of his research the theory has developed and researchers have reacted to critical evaluation by the academy over the last thirty years. Mezirow's ten phases of transformative learning are:

1. a disorienting dilemma;
2. self-examination with feelings of fear, anger, guilt, or shame;
3. a critical assessment of assumptions;
4. recognition that one's discontent and the process of transformation are shared;
5. exploration of options for new roles, relationships, and actions;
6. planning a course of action;
7. acquiring knowledge and skills for implementing one's plans;
8. provisional trying of new roles;
9. building competence and self-confidence in new roles and relationships;
10. a reintegration into one's life on the basis of conditions dictated by one's new perspective. (Mezirow, 2000, p. 22)

By using the phases as an analytical framework, I was able to understand the journey of my participants as they made their transitions into classroom teaching. My research traced the transformations of the participants and identified the characteristics of their graduate teacher education which, in their words, had the greatest impact on

their successful development as secondary teachers. Like many career-changers, the participants in this study entered the teacher education program with vast and tested content knowledge, as well as life experience. The participants had valid, reliable, and rich meaning perspectives. Those meaning perspectives had to be re-framed by the participants in order for them to begin to see themselves as secondary teachers. An understanding of their perspectives as they embarked on their journey to become secondary teachers is imperative to teachers of adults whose goal it is to help their students learn and embrace new ways of viewing themselves and the world. Transformative learning theory provides the framework for identifying that growth (or lack of growth) in learning (Mezirow, 1991).

Literature Review

In reviewing the current literature on transformative learning theory, several trends appeared. I reviewed recent empirical research using Mezirow's (1978) transformative learning theory as applied to higher education and professional settings, how researchers identified transformative learning in their empirical studies and how researchers have sought to measure the transformative learning process (Berger, 2004; Brock, 2010; Brown, 2005; Cranton & Carusetta, 2004; Erickson, 2007; Fetherston & Kelly, 2007; King, 2004; Kitchenham, 2006; Stansberry & Kymes, 2007; Taylor, 2003; Whitelaw, Sears & Campbell, 2004). I drew several conclusions from this review.

First, more often than not, researchers cannot claim that transformation actually occurs (Kitchenham, 2006; Stansberry & Kymes, 2007; Whitelaw et al., 2004). However, success in an educational endeavor seemed to be positively correlated with individuals' likelihood to report transformation (Brock, 2010; King, 2004; Kitchenham, 2006; Stansberry & Kymes, 2007). Second, the studies that did identify transformation tended to be longitudinal in design (Brown, 2005; Cranton & Carusetta, 2004; Fetherston et al., 2007; Kitchenham, 2006; Taylor, 2003) implying that the transformative process generally requires a period of time longer than a typical school semester. Third, it was evident from the literature that Mezirow's transformative learning theory has matured substantially since its introduction in the 1970s. It is now a theory that has been validated through conceptual debate and empirical studies, demonstrating its usefulness as a lens through which to analyze adult learning.

This body of literature simultaneously frames my work and points to a gap in the research. My study helps to inform researchers and teacher educators of the journey taken by adults becoming secondary teachers. By better understanding their journey, we increase the likelihood that improvements in instruction will help recruit, teach and retain adult learners in secondary education fields.

Methodology

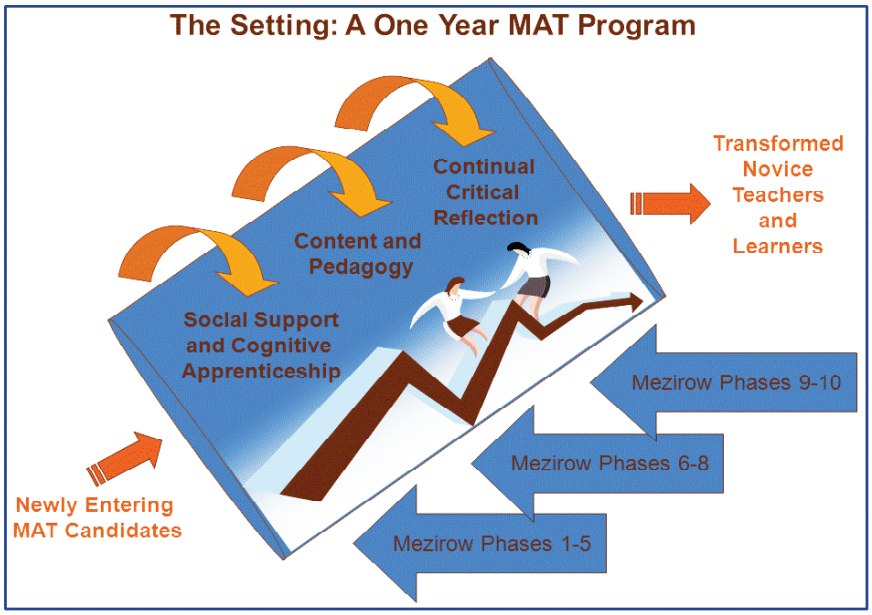
The goal of this study was to identify the replicable elements of a teacher education

program which facilitate career-changing students' successful transformation to professional secondary teaching. Several recommendations were gleaned from the review of literature on this topic and on the use of Mezirow's transformative learning theory in research. First, the challenge presented by the research agenda was to design a study which would reveal evidence (or lack of evidence) of Mezirow's transformative phases of learning without overtaxing the participants in the form of too many time-consuming data collection methods. Second, the study needed to span a length of time sufficient for transformation to occur (longer than a semester). Third, multiple methods were needed in order to hear the voices of the various participants. And finally, the setting became relevant as I needed to be able to remain in contact with the participants over the three year timeline and have a level of interaction with the participants which would allow for open conversation. For these reasons, a mixed method, qualitative approach was chosen along with the immediate setting in which I teach.

Setting

The setting for this study is a small independent graduate college in the northeast offering a Master of Arts in Teaching in several disciplines. Because of the program's flexible nature, it tends to attract career changers; in any given class, up to 30% of the students would be considered non-traditional graduate students. The remaining 70% are typically between 22 and 25 years of age.

Figure 1
MAT Program Aligned with Mezirow's Transformative Phases



Despite the program's thoughtful design, however, conversations with faculty revealed that few had thought overtly about the differences in the way adults learn. While all recognized there were differences, and could readily discuss those differences, no research had been done with our own students or graduates into this area in an attempt to surface or hone in on ways to better meet students' learning needs. The graphic below illustrates the program's already well-established pathway for its candidates aligned with the study's use of Mezirow's transformative process.

Study Design

This was a qualitative case study of four women's journeys through the MAT program and the two years following the program. The research was conducted in three primary steps: analysis of archived data, participant generated photography and face-to-face interviews. The study was reviewed and accepted by the Institutional Review Board.

Step One: Analysis of Archived Data. Archived data was gathered from participants and analyzed for evidence of transformative learning. (Application Essays, Field Work Journals, Summer Journals, Trimester Evaluations, Philosophy of Teaching Narrative, and The Teacher I Have Become Narrative). In total, 150 to 200 pages of archived reflective writing was collected from each of the four participants.

The data were cataloged, digitized and secured electronically. They were then organized by participant and coded using several lenses: First was the use of Mezirow's theory of transformative learning (2000). Evidence of the transformative process was coded and tracked with attention paid to participants stories (Rubin & Rubin, 1995), the participants voice and use of I statements (Gee, 1999). It was observed, for example, that the tone of I statements for all four participants changed over time from reluctant, nervous and investigatory to planful and then confident. Coding was done using a system similar to the comparative method as outlined by Sharon Merriam (1998). A running analytic memo (Charmaz, 2006; Glaser & Strauss, 1967; Tuleja, 2002) was also kept as the data was analyzed.

Step Two: Participant Generated Photography. As themes emerged in the data, already reviewed data were revisited with an eye toward verifying or setting aside potential thematic threads. Once the archived data was fully analyzed, the study entered its second step, participant-generated photography (Perka, Matherly, Fishman and Ridge, 1992; Taylor, 2002). In their second year of teaching, participants were provided with disposable cameras and invited to take pictures of the 'teachers they had become.' This step in the research design served as a check to the themes emerging from the archived data and informed the interview protocol.

This step was added to the methodology after the study commenced (and approved by the Institutional Review Board). Once the coding of the participants' writing was underway, it became clear that over the three year timeline of the study, an intermediary step was needed to better understand the participants' growth over time.

It would not be enough to capture their thinking at the beginning of their journeys and then again in their third year, another checkpoint was needed. Several different methodologies were considered: additional interviewing, journaling, and blogging, for example. My goal was to capture the participants' thinking about their growth as teachers without imposing a large time commitment on their already busy schedules. After researching ways that participant-generated photography were applied in various research settings, I decided this methodology would allow me to check in on my participants' growth without imposing several hours of work on them.

A pilot study was conducted where the procedures and directions for the participant-generated photography were tested and modified. Then, participants were invited to use a 20-shot disposable camera to take photos of the "teachers they had become." The directions were purposely kept none-specific, allowing for the participants to define themselves as professional teachers in whatever way they saw fit. For instance, participants were not limited to only taking pictures of themselves, their classrooms or immediate work environments. If they wanted to take pictures of their families or home, they could. Once the cameras were given back to me, I printed each photo on a sheet of paper with lines underneath the photos. Participants were then asked to write brief descriptions under the photos they felt represented the teachers they were becoming.

The insertion of the participant generated photography step in the research study had several positive consequences. It put me back in touch with the participants in a direct way. At the point where I completed the coding, the face-to-face interviews were still some time off. I began to feel disconnected from the participants' growth as novice teachers. The insertion of this step allowed me to reconnect with the participants and also provided an opportunity for the participants to reflect on their teaching and the process of change they were undergoing as they became more and more comfortable with their relatively new roles as professional teachers. The photographs provided a point of dialogue for the interviews and revealed some reflection on the part of the participants that I think would not have been revealed had the photos not been used. For instance, one participant took several pictures of her colleagues. These photos showed her working together with a special education co-teacher, her department colleagues and department chairperson. This series of photos allowed us to talk about the role her colleagues played in her work, her growth and her perception of herself as a teacher.

Step Three: Face-to-Face Interviews. The third step consisted of a face-to-face interview with participants using a semi-structured (Merriam, 1998) interview protocol and the participant-generated photographs. All of the questions were asked of all the participants, but the order was sometimes changed to accommodate a more natural conversational flow. The photographs taken by the participants were the starting point for each interview. The photographs served a couple of purposes. First, they served as a comfortable way to open conversation. The participants en-

joyed discussing the photographs, their reasons for taking certain pictures, and the students and colleagues in the pictures. Second, the photos served as a lens through which to analyze the robustness of the themes emerging from the archived data. For example, collegiality emerged from the archived data as a dominant facilitator of transformation among the participants. The appearance of pictures of colleagues reinforced the need to bring this topic up in the interviews.

The questions focused on the theme introduced to the participants in step two, that is, "the teacher they had become." Questions revolved around the progress they had made in their teaching skills and integration into their newly chosen profession.

The transcribed interviews were then analyzed and coded in conjunction with the findings from the first two steps of the research. The elements of their teaching which participants' identified as contributing to their success were coded and traced back through the analysis of the photography and archived data. Themes that remained persistent throughout the three year timeline were identified as substantially contributing to their successful transformation to becoming secondary teachers. Throughout all three steps of the research on-going conversations with the participants were conducted via email. Participants member checked (Patton, 2002) conclusions, clarified and added information where needed.

The three research steps (analysis of archived data, participant-generated photography, interviewing) allowed for a strong cross-checking of emergent themes. Coupled with the use of analytical memos, emailing with participants and formal member-checking, the findings reported here were heavily triangulated and reported with confidence. The particular data collected allowed for the revelation of transformation which I could then match with the work Mezirow conducted to say with confidence that the participants did indeed experience a transformation in terms of how they viewed themselves professionally and how they thought about themselves as professional educators.

It should be noted that I am a full time instructor in the MAT program, the setting for the first year of the study, and have taught the classes from which most of the archived data is taken. I taught the cohort under study; however, during that time period I did not consider using their work in a study. From that perspective, I view my analysis as valid. Additionally, my personal experience and interaction with the participants in many ways enhanced my insights into the transformative process experienced by the participants.

The Participants' Journey

Below is a summary recounting of the four participants' journeys toward becoming secondary teachers. Each participant (Rebecca, Tosha, Mary, and Elizabeth) spent between seven and 20 years in a previous career (engineering, pharmaceutical sales, science research). Prior to entering the MAT program, all had brushes with teaching (Sunday school teaching, tutoring, and in one case, independent school teaching).

Two of the four participants had master's degrees in their content areas; all four were mothers. Despite this wealth of experience and expertise, all four showed varying signs of stress, doubt and need for support. The quotes below come from all four participants and were selected to step the reader through the transformation taken by them as seen through the lens of Mezirow' s transformative learning theory (1991). Considering the need for brevity, I selected to highlight phases one ("disorienting dilemma"), three ("critical assessment of assumptions"), seven ("acquiring knowledge and skills for implementing one's plans") and ten ("reintegration into one's life on the basis of conditions dictated by one's new perspective") (Mezirow, 2000, p. 22). These phases were selected because the milestones represented by these phases provide those who might not be familiar with Mezirow's theory a clear sense of the transformative progression. The transformation under study was the shift these participants underwent as they transitioned from thinking about themselves as a professional engineer, businesswoman or science researchers to professional educators. Despite their skills and background, the transformation was still deep and difficult. Following this section will be a discussion of the findings that resulted from the analysis of this qualitative data.

Phase One: Disorienting Dilemma

According to Mezirow (1991), adults engaged in transformative learning move down a predictable pathway involving a prompt, intake of new knowledge and reintegration. At first, adults find themselves in a "disorienting dilemma" (Mezirow, 2000, p. 22). At this point in the learning process, there is typically either an immediate need or desire to learn something new, and an unsettled sensation on the part of the learner or "an accretion of transformed meaning schemes resulting from a series of dilemmas or in response to an externally imposed epochal dilemma…" (Mezirow, 1991, p. 168). The disorienting dilemma occurs because a formerly reliable meaning perspective suddenly appears to be less reliable than previously thought, thus prompting an uncomfortable need for resolution.

For Mary, the disorienting dilemma seemed to come in two layers: personal and professional. Prior to entering the MAT program, Mary started to feel the need to do something to give back to society, and at the same time she was coming to terms with the eminent dissolution of her marriage, a clear trigger event. Reflecting back on her journey toward teaching, Mary said in her interview:

> I got to the point where I felt like I wasn't giving back, I wasn't contributing anything to society. And that's what made me start thinking about it…and at the same time my marriage is falling apart and so I was like, well, you know, I could move back up to [home state] and finally get to teach 'cause it had been like four years between deciding that's what I wanted to do and making the move. Um, but it was what I was doing, it didn't seem important. You know I wasn't doing anything to contribute to society and help people. So that's why.

In addition to the very personal "epochal" (Mezirow, 1991, p. 168) dilemmas Mary faced, she also experienced some professional disorientation as she entered the MAT program. While she initially expressed confidence, as is evidenced in the excerpt below, when confronted with actual students and classrooms, her confidence quickly waned. In explaining her teaching skills Mary wrote in her journal:

> During my years in the industry, one of my prime responsibilities was to train our company's newly hired engineers and our customers' shipboard personnel. Because of these responsibilities, I worked with an incredibly diverse array of learners. Onboard the ships, I encountered people with language barriers, as well as people at varying levels of intellect. I learned very quickly that material needed to be presented in ways so that everyone could succeed, regardless of their personal styles of learning.

Just prior to actually entering a classroom for observation, the confidence expressed above disappeared. In a journal entry written just prior to entering the classroom for the first time Mary became concerned and self-reflective as she wrote:

> I will be nervous because I am entering into a complete unknown…it seems that technology teachers are teaching a much more advanced curriculum than I ever learned. The experience will be a lot to take in and absorb and I am concerned I won't be looking for what I need.

It might seem surprising that a naval engineer with 13 years of experience would second guess her ability to teach a technology curriculum. The angst Mary expressed points to the fragility of the adult learner when encountering a new environment. As Mezirow explains, it is precisely because of the well-established frame of reference Mary has with regard to technology and engineering that she felt this angst. The potential to have to understand what she knows *in a different way* was destabilizing, even for an experienced engineer.

Rebecca entered the program with a master's degree and years of experience as a researcher in a blue chip company. She also taught new colleagues at large training sessions and felt well-prepared for the MAT program. Shortly after entering the program, however, Rebecca started to understand that secondary teaching would require her to learn a new set of skills and a new way of thinking about her professional life. She wrote:

> Part of my struggle is to realize that I cannot escape having to learn through mistakes. Experience and time appear to be the primary teachers of this profession, and I have to accept that I cannot change the inevitability of learning the hard way. My pride badly shattered, I am now much more humble.

The disorientation is palpable in Rebecca and Mary's reflections. The need for purposefully mentored support, particularly during the early stages of integration into a teaching program cannot be overlooked.

Phase Three: Assessment of Assumptions

Phase three of transformative learning theory states that individuals experience "a critical assessment of assumptions" (Mezirow, 2000, p. 22). This was evident in the participants' writing and interviews as they discussed how their understanding of effective teaching was changing. In particular, the way the program revisited key themes seemed to play an integral role in opening up previously held assumptions about teaching to new interpretations. Elizabeth wrote in her journal, "This is now the third time I was being asked to think about what made a good teacher, and I have to say, my original ideas broaden with each learning experience." Later, Elizabeth specifically questioned her understanding of lecturing as a teaching technique:

> As I write the word "lecture," I have to comment that the term has a whole new meaning for me as I learn all these teaching models. I no longer have the vision of standing in front of the room for forty minutes talking to my students. I now understand what it means to make my students active learners, while imparting the needed information. All the while, of course, helping them become better readers and thinkers.

Similar to Elizabeth, Mary questioned her assumptions about effective teaching after learning a particular student-centered technique. She wrote:

> Today's cooperative learning activities were difficult for me. I had a really hard time keeping myself from taking over and just doing it myself. Kind of a "If you want to get the job done right, do it yourself" attitude. I have always thought that things like pair-share and peer tutoring benefit both students involved, but to me they are different than what we did today. In pair-share, you already have your answer, you are just sharing it with someone else and in peer tutoring, you already "have the answer" and now you are teaching it to someone else. What we did today involved a lot of working together to come up with an answer we all agreed on. I really had to squelch the temptation (especially when I was facilitator) to have everyone do it on their own and then compare answers and choose one. But, as a teacher, I really see the value of NOT doing that and how the people in our group benefited from hearing each others ideas…by the end of the exercise it was more of a "we are a team and we look out for each other" feeling, which builds on the social aspect of learning…As a technology teacher, I see so many ways I could use cooperative learning in the classroom.

After learning about a new methodology by participating in an enactment of it, Tosha wrote a quick observation in her journal, "I'm also not sure we would really have believed it if we hadn't tried the exercises ourselves."

Evidence of questioning previous assumptions about teaching is prolific throughout the participants writing. Elizabeth, moving into her second trimester in the MAT program wrote:

> Had you asked me the role of a biology teacher seven weeks ago, I would have told you it was my job to ensure that students are learning the material and succeeding in class. I thought to accomplish that goal meant presenting information to my

> students in a creative and motivating fashion. Since this summer experience has begun, I realize it encompasses a lot more.

Elizabeth reflected on her experiences with a student-centered learning model that had been presented in her methods class. At first she was reluctant to try using student-centered models in her teaching, but after experiencing them as a learner, she wrote:

> "Teaching is not about coverage, but rather uncoverage," stated [B]. How true! I should not be looking at my curriculum as material I have to present to my students, but rather information that my students will uncover as I expose them to notes, diagrams, labs and text.

Again, the questioning of previously held assumptions was being brought to bear by the new learning the participants were experiencing. Their reflective journaling reveals a gradual perspective transformation as they embrace the ways of thinking about teaching promoted by the teacher education program.

Phase Seven: Knowledge and Implementation

Phase seven of transformative learning theory revolves around "acquiring knowledge and skills for implementing one's plans" (Mezirow, 2000, p. 22). This phase was evident in ways the participants wrote with increasing confidence about their emerging professional practice, interaction with classmates and with colleagues. Tosha wrote eloquently about one interaction she had with a classmate, revealing both her burgeoning confidence and the important role of relationships played in the participants' growth toward becoming secondary teachers. Tosha wrote:

> …today caps a somewhat bruising week in terms of both workload and emotional impact. Today a fellow student…came to me in tears, wondering if the next 5 years were going to be as intense as this next year was shaping up to be. (I told the person yes and no; it was safe to assume that the student would be working very hard for some time to come, but that the rewards were substantial and that after the first year, I began to see things getting easier. The learning doesn't stop, but the competent days really outnumber the incompetent ones and the whole process is less manic.) I've been thinking about the exchange and what I can learn from it. The bottom line, I think, is that there really is no royal road to learning to teach (to borrow Euclid's line about geometry). However, it meant a lot to me that another student sought me out to talk—it says a lot about the community that's being created in the classroom. It has become an environment where people feel comfortable exposing what they don't know, which is critical both to being able to learn (since all of us will feel and/or look dumb at some point in the process) and to being able to support each other.

Tosha illustrates just how much the participants are learning with the above example by elucidating the role teachers play with each other: one of support, encouragement and collegiality.

Mary discussed new skills she was acquiring with some humility. She wrote about her first attempt at test creation. While she expressed great difficulty with the task, were it not for her opportunity to wrestle with the complex nature of test creation, she would not be as prepared to enter the classroom. Mary wrote:

> As a student, you never would image the amount of work that is required to create quality test items. Today I realized that just the simple fact that they should be concise and unambiguous, which is a kind of a no-brainer, requires a tremendous amount of thought.

Mary benefited from having an authentic task to complete as well as a mentored environment in which to try out this new skill. While her first attempt was not terribly successful, she was able to reflect on it and recognize the work that still needed to be done. Mary also saw potential teaching opportunities in the activities she was asked to complete as a student in the MAT program. In her interview, Mary reflected:

> I never thought I would say this, but I think that journaling was an amazing way to get us as students to really think about what was going on in class and how we can apply it to our future teaching. From a teacher's standpoint, the journaling allowed you to see what we were taking away from the class and how we would use it and how our thoughts were developing as teachers. I think that I could use reflective journaling in the classroom, as part of the discovery process for the students.

Not only is there evidence of Mary's acquisition of new skills and new ways of thinking about teaching, but also her recognition of the importance of reflective thought. The above statement was made during her second year of teaching, at a point when she had the experience and time to potentially integrate what she had learned into her teaching. This quote also demonstrated Mary's continued evaluation of assumptions she had about what effective secondary teachers do. Prior to her MAT education and teaching experience, Mary would have dismissed journaling as a teaching tool, particularly in a technology classroom.

Phase Ten: Reintegration

In phase ten of transformative learning theory, there is a "reintegration into one's life on the basis of conditions dictated by one's new perspective" (Mezirow, 1990, p. 22). In this phase, one sees evidence of the previous nine phases of the theory coming together. Rebecca provides a good example of this reintegration in a series of quotes from her interview near the end of her second year of teaching. She states:

> …this whole teaching gig works a lot better when you share ideas and support your colleagues. I've mentioned this before in these journals – it is very easy to chain yourself to your teacher desk because there's so much to do, especially early in a career when you're figuring a lot of things out. The great irony is that this might be when you most need the support of your colleagues.

She went on to say:

> I felt like two years ago, I had learned a lot. I was ready to go. And now, having done it —the same [curriculum] for a second year, I still feel like, okay, how could I make this better? How can I make the curriculum better? How can I, what can I do for the kids?

It is clear that Rebecca's earlier doubts about her ability to teach are gone. One gets the impression that this person views herself as a teacher, not as a science researcher trying to be a teacher. Near the end of the same interview she provides evidence not just of her confidence in herself as a secondary teacher, but also of the perspective transformation that has occurred. In response the question, "Tell me about the teacher you have become?" Rebecca states:

> There's no question I had no idea how complex and challenging it was. I did go into it having trained and tutored. I'm thinking it was just something of information…now I know that it's so much more than that…So I would say I look at not only teaching, but life differently, as a result of going through [the program]…it helped me see people differently…not taking it face value, but understand there's a whole lot more going on. I may not know why things are happening the way they are, but to realize that there's more to the story than what is appearing for the time...And what the program did was make key connections to what I'd already knew, but hadn't put together, and it made it all fit together in a way that made sense…I feel lucky that I have that perspective change in me.

Rebecca went on to say:

> I feel I am a teacher. I can remember the day that you all greeted us with "Good morning, teachers, "and it was like, no way. Who are you kidding? I am not a teacher. I am just a fake, you know. I don't have the abilities to be a teacher. So now, I can say I'm a teacher and feel like I am. I feel that I can talk about, talk with other teachers and give and take. But I'm not always taking, that I can contribute as well, based on a limited experience, but I still have experience. So that feels good. I don't feel like I'm just a student, but I'm a practitioner.

Near the end of Mary's interview, she too provided strong evidence that she had moved through all ten phases of the transformative process when in answer to the same question she said:

> I've become less of an engineer and more of a teacher…it's a lot more challenging than I thought it would be…I really thought…that …I would walk in and just start teaching, and forgot that you have to deal with kids! You know, um, it's more rewarding than I thought it would be, honestly…you have that day where that one kid finally gets it. I'm like, YES! I still have a lot of my engineering tendencies, and I still have to catch myself…I can still be a nerd, but I have to get that engineering anal retentiveness gone, and, I mean, I have done a REALLY good job, I'm very proud of how far I've come, but I see that I still have a way to go…to get that balance. I think I'm right about here with the engineer and the teacher [Mary

makes a balancing motion]…You know…I think the teacher I have become is a teacher, and not an engineer.

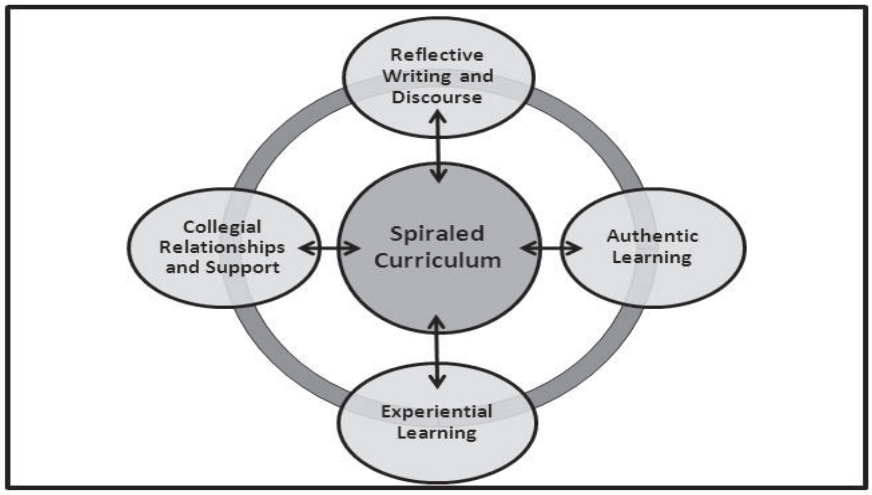
Findings: Five Emergent Themes

The five transformative characteristics of teacher education which emerged from this study are: spiraled curriculum, authentic learning, experiential learning, collegial relationships and support, and reflective writing and discourse. The themes emerged from the coding that was completed of the archived data, combined with the analysis of the participant-generated photography and interview data. As themes emerged in individual participant's work, evidence supporting or refuting the themes was examined among the other participants. The five themes explicated below were consistently strong in the participants' voices throughout the study. When presented with the themes in the final stages of the resaeach, they all agreed that the five themes capture much of what contributed to their successful professional transformation from scientists and busineess women to secondary teachers.

1. A Spiraled Curriculum

The program from which the participants graduated employed a spiraled curriculum (Teacher Education Accreditation Council Audit Report, 2008, p. 2). In the field of education, a spiraled curriculum is one in which big ideas are continually revisited in new and deeper ways in service to the students' growing understandings. A big idea for a candidate in a teacher education program might be her teaching philosophy. This is likely to change dramatically over the course of a program if students are taught to and asked to be metacognitive about their changing views.

Figure 2
Transformative Components of Effective Teacher Education



The participants in this study recognized that the program made a point of revisiting key concepts in teaching, and appreciated the opportunity to reflect on those concepts.

Each interaction with big ideas allowed students to test changing points of view. Examples of these changing view points, like Elizabeth and Mary's examples above, were documented in the data collected in this study. Participants were given multiple opportunities to test, modify and eventually validate their changing views.

Spiraling the curriculum aligns with Mezirow's claims regarding adult learning. It is only through multiple exposures to new ideas that adults begin to consider existing epistemologies vis-à-vis new learning. By repeatedly circling back to big ideas in teacher education in new and consecutively enriching ways, the likelihood that a candidate will transform her epistemological framework toward a meaning perspective that will result in successful teaching increases. Spiraled curriculum is placed at the center of Figure 2 because it is the context within which the other four components (experiential learning, authentic learning, collegial relationships and support, and reflective writing and discourse), take place.

2. Experiential Learning

The participants repeatedly referenced the usefulness of understanding the connection between teaching and learning. The participants all felt that in order to become highly effective teachers, they needed to understand the learning process. As one might expect, examples focused on their teaching internships, but also on their frequent analysis of themselves as learners. The participants expressed a valuing of their experiences as teachers and also as learners.

Teacher candidates need to be given the opportunity to experience teaching *and* learning in multiple and repeated ways. For instance, it is not enough to teach

Figure 3
Rebecca's Students Working on a Suchman Inquiry Lesson

candidates about a particular teaching method. Candidates should experience it as learners, then again as teachers, and multiple times. By providing teacher candidates the opportunity to consider teaching from the perspective of both the teacher *and* the learner, the candidate can begin the process of measuring their success not based on how well they teach, but rather on how and how well their students learn.

3. Authentic Learning

Along with experiential learning, the work that teacher candidates do must be authentic, that is, as close as possible to the work that professional teachers do every day. The participants in this study continually cited authentic teaching and learning experiences as having a big impact on the way they think about themselves as teachers and the way they think about teaching. This finding specifically aligns with Mezirow's phase 5, "exploration of options for new roles, relationships, and actions" (Mezirow, 2000, p. 22). According to Mezirow, adults need to practice implementing emerging ideas. Without the opportunity to practice in a safe and mentored environment, those new ideas will not be tested or validated. Without validation, transformation will not take place. Authenticity in teacher education is the key to providing opportunities for teacher candidates to try out their emerging learning, integrate that learning into their epistemologies and grow as educators.

4. Collegial Relationships and Support

Collegiality is central to the successful training of novice teachers. Novice teachers need an environment and modeling in order to develop those new relationships. Teacher education programs need to consciously create opportunities for students to develop trusting relationships so that students can create for themselves a support network to help each other succeed. All the participants in this study repeatedly referred back to the required camping trip at the beginning of their program as a formative experience in their thinking about teaching and development of lasting friendships. That trip created a foundation upon which the participants could build professional relationships. Collegiality was modeled by and among the faculty. Teacher candidates were invited to interact with the faculty as colleagues in a safe and mentored environment with the goal of teaching the candidates how to build those relationships after leaving the program. Collegial behavior was conducted transparently and purposefully, to the point where it was specifically recognized by the study participants as integral to their success. This notion aligns with Mezirow's transformative learning phase 9, "building competence and self-confidence in new roles and relationships" (Mezirow, 2000, p. 22).

5. Reflective Writing and Discourse

The importance of the reflective process needs to be made overt to teacher education students. It is not something they should come to in a personal aha moment, but rather something they should be taught to anticipate. By making the

reflective process transparent, students learning to be teachers will become more aware of their own reflective thinking sooner, and thereby be able to learn to make use of it sooner. Additionally they will be able to observe their instructors' reflective processes sooner.

The goal is to automatize reflection, so that when teacher education students enter the field of teaching they continue to reflect on their own growing and changing professional practice. The reflection needs to be iterative. That is, reflective writing and dialogue should be read and heard by faculty in an on-going way. Journals should be responded to in a way that makes them a continual conversation between the teacher education student and the faculty member. Once students recognize that their reflections are being paid attention to, they will take on a more significant meaning. They might also, as this study revealed, be willing to take risks in their learning, recognizing that they will be able to explain those risks to their instructors through reflective writing or dialogue.

Discussion and Conclusion

The findings of this study rely on an assumption that stems from the work Jack Mezirow conducted in the 1970s with women returning to school in order to join the workforce and from the qualitative approach taken by the author. From that original study, published in 1978, Mezirow observed a set of characteristics which he labeled transformative learning. Mezirow makes the assumption that generally speaking, transformation as he defines it is a beneficial endeavor, going as far as to use the word "superior" when referring to thinking that results from perspective transformations (1990, p. 14). This study revealed perspective transformation in its participants as they endeavored to recast themselves as secondary teachers. This transformation left them more open to new, more integrative and broader ways of knowing which they then applied to their teaching craft. The emergent themes were derived directly from the participants' voices. The themes represent teacher education characteristics which most strongly influenced their transformations.

Taken as a whole, the five transformative components of effective teacher education create a scaffold for the delivery of effective teacher education (Refer to Table 1.) Teacher educators need to be thoughtful, present, and purposeful as they guide teacher candidates toward their goal of becoming effective teachers. Teacher education programs need to provide a setting where adults can transform their thinking about teaching and learning toward a research-based epistemology that will serve them and their students well throughout their careers. The likelihood of achieving this goal is significantly increased within the context of a program that incorporates a spiraled, experiential and authentic curriculum with collegial support and reflective practices. These characteristics of transformative teacher education surfaced as a result of a long-term analysis of what four teacher candidates felt was important to them in achieving success as teachers. The relevance

of their understandings should not be underestimated in the academy's continued work toward highly effective teacher education.

A study is now underway to test the generalizability of these characteristics across a larger number of teacher education candidates. Candidates from the program in this study as well as other programs have been surveyed and asked to place relative value on the five transformative characteristics as compared to other aspects of their teacher education programs. Preliminary findings indicate a strong argument for generalizability. Work must also be done to clarify and specify the meanings of the five characteristics so that they might be broadly useful to teacher educators.

References

Berger, J. G. (2004). Dancing on the threshold of meaning: Recognizing and understanding the growing edge. *Journal of Transformative Education, 2*, 336-351.

Brock, S. E. (2010). Measuring the importance of precursor steps to transformative learning. *Adult Education Quarterly, 60*(2), 122-142.

Brookfield, S. D. (1986). *Understanding and facilitating adult learning*. San Francisco: Jossey-Bass.

Brown, K. M. (2005). Transformative adult learning strategies: Assessing the impact on pre-service administrators' beliefs. *Educational Considerations, 32*, 18-26.

Table 1
Five Transformative Components of Effective Teacher Education

Component	*Characteristics in a Teacher Education Program*
Spiraled Curriculum	Big ideas are transparent and incorporated into all aspects of teacher preparation program with clear and measurable candidate performance goals.
Experiential Learning	Learning and teaching is carried out by and with candidates in all aspects of teacher education program. Incorporation of experiential learning is documented throughout curriculum.
Authentic Learning	All candidates' learning is modeled after professional teacher work and is consistently aligned with professional teacher work.
Collegial Relationships and Support	Collegiality among candidates and between candidates and professional teachers occurs persistently and in a trusting, nurturing environment. Development of collegial relationships is transparently incorporated into all aspects of the teacher education program.
Reflective Writing and Discourse	Both written and verbal critical reflection is taught, modeled and takes place within every aspect of the teacher education program.

Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. Thousand Oaks, CA: Sage.

Cranton, P., & Carusetta, E. (2004). Developing authenticity as a transformative process. *Journal of Transformative Education, 2*, 276-293.

Dewey, J. (1938). *Experience and education*. New York: Kappa Delta Pi.

Erickson, D. M. (2007). A developmental re-forming of the phases of meaning in transformational learning. *Adult Education Quarterly, 58*(1), 61-80.

Estes, T. H., Gunter, M. A., & Mintz, S. L. (2009). *Instruction: A models approach*. Boston: Allyn & Bacon.

Fetherston, B., & Kelly, R. (2007). Conflict resolution and transformative pedagogy: A grounded theory research project on learning in higher education. *Journal of Transformative Education, 5*, 262-285.

Gee, J. P. (1999). *Discourse analysis: Theory and method*. New York: Routledge.

Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. New York: Aldine de Gruyter.

Holt, J., & Unruh, L. (2010). First-year teaching experiences: Are they different for traditionally versus alternatively certified teachers? *Action in Teacher Education, 32*(3), 3-14.

Kegan, R. (1994). *In over our heads: The mental demands of modern life*. Cambridge, MA: Harvard University Press.

King, K. P. (2004). Both sides now: Examining transformative learning and professional development of educators. *Innovative Higher Education, 29*, 155-174.

Kitchenham, A . (2006). Teachers and technology: A transformative journey. *Journal of Transformative Education, 2*, 202-225.

Kolb, D. A. (1984). *Experiential learning, experience as the source of learning*. Upper Saddle River, NJ: Prentice Hall.

Merriam, S. B. (1998). *Qualitative research and case study applications in education*. San Francisco: Jossey-Bass.

Merriam, S. B. (2004). The role of cognitive development in Mezirow's transformative learning theory. *Adult Education Quarterly, 58*(1), 61-80.

Mezirow, J. (1978). *Education for perspective transformation: Women's re-entry programs in community colleges*. New York: Teachers College Press.

Mezirow, J., & Associates (1990). *Fostering critical reflection in adulthood*. San Francisco: Jossey-Bass.

Mezirow, J. (1991). *Transformative dimensions of adult learning*. San Francisco: John Wiley & Sons.

Mezirow, J., & Associates (2000). *Learning as transformation: Critical perspectives on a theory in progress*. San Francisco: John Wiley & Sons.

Patton, M. Q. (2002). *Qualitative research & evaluation methods*. Thousand Oaks, CA: Sage.

Perka, P. L., Matherly, C. A., Fishman, D. E., & Ridge, R. H. (1992). Using photographs to examine enviro-mental perceptions of African-American and White Greek members: A qualitative study. *College Student Affairs Journal, 12*, 7-12.

Rubin, H. J., & Rubin, I. S. (1995). *Qualitative interviewing: The art of hearing data*. Thousand Oaks, CA Sage.

Stansberry, S. L., & Kymes, A. D. (2007). Transformative learning through "Teaching With Technology" electronic portfolios. *Journal of Adolescent & Adult Literacy,*

50(6), 488-496.

Taylor, E. W. (2002). Using still photography in making meaning of adult educators' teaching beliefs. *Studies in the Education of Adults, 34*(2), 123-139.

Taylor, E. W. (2003). Attending graduate school in adult education and the impact on teaching beliefs: A longitudinal study. *Journal of Transformative Education, 1*, 349-366.

Teacher Education Accreditation Council Audit Report. (Fall, 2008). Union Graduate College, Schenectady, NY.

Tuleja, E. A. (2002). A qualitative research study of oral communication performance. *Performance Improvement Quarterly, 15*(3) 130-148.

Whitelaw, C., Sears, M., & Campbell, K. (2004). Transformative learning in a faculty professional development context. *Journal of Transformative Education, 2*, 9-26.