

Impact of a Problem-Based Learning Curriculum on Pre-Service Teacher Development

By

Aubrey S. Vogel

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This dissertation is approved by the following members of the Final Oral Committee:

Mary Louise Gomez, Professor, Curriculum and Instruction  
Dawnene Hassett, Associate Professor, Curriculum and Instruction  
Melissa Braaten, Assistant Professor, Curriculum and Instruction  
Nancy Athanasiou, Associate Professor, Dean of School of Education, Alverno College

*For Frank*

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## Abstract

This dissertation explores the impact of a problem-based learning curriculum on pre-service teachers' construction of self-as-teacher and what they understand as their role within multicultural education. My analysis of a problem-based learning curriculum implemented in the first Education course required for all Education majors and minors at one private liberal arts college suggests that, ultimately, pre-service teachers have opportunities to build a sense of self-as-teacher and understand their role(s) within multicultural education through engagement in a problem-based learning curriculum. The impact of the problem-based curriculum, however, must be weighed against where they are situated along the trajectory of their development and progress within the overall sequence of Education coursework. In the case of this research study, the participants were all early in their development. Their ability to pose thoughtful questions, acknowledge the complexities of teaching and learning, and begin to think about themselves in these complex spaces was important to their overall development.

## Introduction

The social conflicts and inequities that have thus far shaped education are complex and messy; they are not matters easily tamed (Eghigian, 2000). Current approaches to preparing teachers for this work, however, have teachers/professors controlling the amount of exposure to the complexities pre-service candidates will encounter during their development.

Teacher/professors limit the perspectives pre-service teachers can (must) take when they impose upon them the rigid approaches to what should be learned (Eghigian, 2000; Stiker, 2002), as in what makes it onto the syllabus, which materials are referenced and what ideas are shared. A conceptual review of the literature around teacher development, both what candidates need and how programs are currently working toward teacher development, shows room for transformation in the approach to teacher preparation (Ball, 2006; Gorski, Zenkov, Osei-Kofi, & Sapp, 2013; International Alliance of Leading Education Institutes, 2008; Larkin & Sleeter, 1995; McIntyre & Byrd; Murrell Jr., Diez, Feiman-Nemser, & Schussler, 2010; Noel, 2008; Orlofsky, 2001).

At the heart of the transformation is how pre-service teachers gain access to the material they might learn as part of their development. Eckert (1989) advocates for a paradigm shift:

At the moment, the social institutions of our schools are based on middle class models, as are our didactic methods of teaching and notions of 'information transfer.' We tend to think of learning as the result of teaching, and of teaching as a simple transfer of knowledge. In fact, most of the learning we do from day to day is collaborative, and most of the knowledge we have is shared. (p. 183)

A problem-based learning curriculum has the potential to allow for this shared construction of knowledge, as the learner determines what questions to pursue and what sources of information

might provide answers to his/her questions, while the teacher/professor guides the process and “checks in” with group members in this collaborative process, learning along with the students and making sure they do not stray too far from the problem statement (Duch, Groh, & Allen, 2001; Levin, 2001). Within this type of structure, the learners have the capacity to discover new values and think independently because they are actively involved in their construction of knowledge and the refinement of dispositions, all situated within an authentic context (Allan, 2008; Duch et al., 2001; Feiman-Nemser & Schussler, 2010). The inquiry driven by the learner is dialogic and engaging, situated in the communities where the pre-service teacher will teach (McCarty, 2002). However, empirical studies are only just beginning to emerge around how teacher educators are employing a problem-based learning curriculum as part of teacher development.

In light of this information, I reflected upon the structure of a course I had been teaching to undergraduate Education major and minors and became concerned that too many students were simply reciting back to me what they had heard me say, what they had read in the required course textbook and what they heard from guest speakers invited to our class. I wondered what impact, if any, implementing a problem-based learning curriculum in this first course of the required education course sequence would have on pre-service teachers.

This dissertation inquires into the potential of problem-based learning for teacher education, asking the question: How does engaging pre-service teachers in a problem-based learning curriculum impact how they build a sense of self-as-teacher and what they understand as their role within multicultural education? This question is supported by three sets of related questions: 1.) What does existing research identify as the gaps in pre-service teacher development, and how might problem-based learning bridge those gaps?, 2.) How does using a

problem-based learning curriculum foster the type of independent and divergent thinking necessary for pre-service teachers to understand how they are currently situated and begin to build a sense of themselves as future teachers?, 3.) In what ways can a problem-based learning curriculum create a space for a pre-service teacher to begin to formulate her own definitions and understandings of multicultural education? And how does a growing awareness of multicultural education influence a pre-service teacher's development and awareness of self-as-teacher? I approached this study with a qualitative design framework, using different conceptual frameworks through which to look at the data.

### **Organization of the Dissertation**

Each set of supporting questions frames the discussion in each of the following chapters. The chapters are written as stand-alone journal articles; however, the issues raised and the arguments advanced in the separate articles are interconnected in ways that allow them to be read as a larger discussion of the potential of problem-based learning for teacher development. The dissertation ends with a conclusion addressing the implications for the future of teacher education and the development of pre-service teachers.

The first article, "The Potential for Problem-Based Learning in Pre-Service Teacher Development," examines the research behind developing pre-service teachers, particularly the importance of fostering divergent thinking and self-awareness as well as building professional, humanizing dispositions with respect to multicultural education. It addresses how problem-based learning has the potential to address issues of teacher-control and student-mimicry within current, traditional approaches to teacher education courses. The second article, "Problem-Based Learning, Divergent Thinking and Teacher Identity," reports the research I conducted at "Ortler College," a small, private college situated in a large urban/metropolitan city in the Midwestern

United States. In particular, the article provides a summary of four participants' weekly reflections written throughout their experiences with problem-based learning in their first required Education course. As the discussion in this article details, the pre-service teachers began to build a sense of self-as-teacher as they independently navigated a problem scenario and uncovered the complex factors influencing teaching and learning. The third article, "Problem-Based Learning, Multicultural Education and Self-Awareness," reports more of my research at Ortler College, this time focusing on the ways a problem-based learning curriculum can provide the space for pre-service teachers to explore multicultural education and develop their self-awareness around their role as a multicultural educator. The results show that, while the focus participant does not leave the course knowing all there is to know about multicultural education, she does show evidence of an awareness of self-as-teacher and speaks passionately about her perceived role as a multicultural educator. Examined together, the three articles demonstrate that the potential for problem-based learning depends upon pre-service teachers' placements along the trajectory of their development. The argument is not for the exclusive use of problem-based learning as *the* approach to teacher development but rather a way to balance the traditional approaches and address the need for change identified in current research.

### **The Problem of Theory**

As with any qualitative research study employing narrative inquiry, the question of the role of theory is often raised. Regarding the use of a theoretical framework in a qualitative research study, Merriam (2009) asserts, "Part of the struggle in identifying the theoretical framework in a qualitative study is that qualitative research is designed to inductively build rather than to test concepts, hypotheses, and theories" (p. 64). While I was informed by a certain

literature base as I approached my study, I did not set out to prove or employ any one particular conceptual framework.

As my first article, “The Potential for Problem-Based Learning in Pre-Service Teacher Development,” illustrates, many studies around teacher development and multicultural education exist, and the framework of my study drew upon the concepts, definitions, models, and theories of this literature base (Merriam, 2009). After reviewing my data, I looked to conceptual frameworks that would allow me to make sense of the data for my readers. In my second article, “Problem-Based Learning, Divergent Thinking and Teacher Identity,” I employed the conceptual framework around the development of teacher dispositions from Murrell Jr., Diez, Feiman-Nemser and Schussler (2010) as well as Robinson’s (2010, 2011) work on divergent thinking and, related, Fasko’s work on creativity in education, as it relates to the development of learners’ problem solving and divergent thinking skills. In my third article, “Problem-Based Learning, Multicultural Education and Self-Awareness,” I drew upon Noel’s (2008) concepts around developing multicultural educators as well as Bakhtin’s (1990) theories of architectonics and aesthetics.

In contrast, going into my research, I was aware of the fact that there are few studies focused on the use of problem-based learning for teacher education. The studies that do exist primarily focus on students’ perceptions of problem-based learning as a curriculum, specifically the benefits of this type of learning and/or the frustrations or barriers they encountered while experiencing problem-based learning for the first time (Duch et al., 2001; Edwards & Hammer, 2004; Levin, 2001; McPhee, 2002; Murray-Harvey & Slee, 2000). Essentially, one of the reasons I undertook a study around problem-based learning and teacher development was because there was a lack of theory to adequately explain this phenomenon (Merriam, 2009, p. 15). I

approached my study's findings "...with an eye to demonstrating how the present study [could contribute] to expanding the knowledge base" (Merriam, 2009, p. 70) of problem-based learning and teacher education.

### **Addressing the Issue of Small Sample Size**

It is important to note, as Merriam (2009) points out, "in qualitative research, a single case or a small, nonrandom, purposeful sample is selected precisely because the researcher wishes to understand the particular in depth, not to find out what is generally true of the many" (p. 224). The four participants on whom I focus my analysis in the second article and the one focus participant in the third article were purposefully selected but not with the expectation that their narratives would represent any others' narratives or that their narratives could be reproduced in another study. As I discuss in my conclusion to this dissertation, this research study and the results it yielded had very practical implications for me as a teacher educator teaching at the institution represented in my second and third articles. Merriam (2009) notes, "working hypotheses that take account of local conditions can offer practitioners some guidance in making choices – the results of which can be monitored and evaluated in order to make better decisions in the future" (p. 225). The description of the research context, research participants, procedure and methodology make transferability possible; however, "the burden of proof lies less with the original investigator than with the person seeking to make an application elsewhere. The original inquirer cannot know the sites to which transferability might be sought, but the appliers can and do" (pp. 224-225).

## Paper 1

### The Potential for Problem-Based Learning in Pre-Service Teacher Development

*There is an urgent need to recognize teachers' work as complex and demanding, and improvement in teacher quality requires a re-conceptualization of how we prepare a new generation of teachers. Simultaneously, a change in the form and function of teacher preparation is best based on a strengthened or redefined professionalism. The concept of a redefined profession:*

- *Recognizes teacher's work as being based on specialized knowledge and skills, expecting all teachers to have the ability to use them appropriately in a variety of institutional contexts and with diverse student demographics;*
- *Necessitates that teachers adopt an inquiry orientation to investigate issues, and critically utilize evidence-based knowledge to inform professional practice;*
- *Requires teachers to accept responsibility for the academic and emotional outcomes of their students by setting realistic goals, structuring learning environments, and facilitating and guiding learners;*
- *Accepts the involvement of education stakeholders and non-education communities to work in collaboration to ensure that educational reforms and efforts remain pertinent to society; and*
- *Expects teachers' self-directed commitment to continuous learning related to the individual's own expertise and experiences and is directed towards enhancing student outcomes and strengthening professional identity.*

*~The International Alliance of Leading Education Institutes,*

*Report on Transforming Teacher Education, 2008, p.9*

As the above summary from the International Alliance of Leading Education Institutes states, today's teachers need to be able to work with a diverse student body; commit to using inquiry and evidence to inform their pedagogy; be able to set goals for their students and structure a learning environment to support those goals; collaborate; and be self-directed and continuous learners with a strong professional identity. Levinson (2000) and Orlofsky (2001) as well as other researchers in the field (Allan, 2008; Davidman, 1990; Henry, 2000; Pajak, 2000;

Stovall, 2013) contend that pre-service teachers need opportunities to develop these skills and dispositions in their teacher education programs.

There exists no one correct way to approach teacher preparation. However, the International Alliance of Leading Education Institutes (2008), along with many leading scholars (Ball, 2006; Gorski, Zenkov, Osei-Kofi, & Sapp, 2013; Larkin & Sleeter, 1995; McIntyre & Byrd, 2000; Noel, 2008; Orlofsky, 2001), has identified key elements for developing teachers. The first is to develop pre-service teachers' "capacity for reflective practice, critical inquiry, information literacy and professional engagement in learning communities." Another is to prepare them to "better address issues of equity, inclusion, diversity and social justice" (p. 10). Problem-based learning, with its goals on developing learners' abilities to think critically, solve problems effectively, find and evaluate relevant resources, work collaboratively, develop communication skills, and work to become self-directed and continual learners (Duch et al., 2001; Edwards and Hammer, 2004; Savery, 2006; Torp & Sage, 1998), has the potential to create the space and opportunities for developing the key elements identified above.

In what follows, I include a conceptual review of the literature around key aspects of teacher development, particularly pre-service teachers' development of their self-awareness and divergent thinking. Then, I present a conceptual review of what research shows to be the traditional and most widely-used methods for developing pre-service teachers, pointing particularly to the detriment of control, mimicry and the perpetuation of the status quo. I conclude this paper by placing my research questions around problem-based learning in the context of the existing research about and current approaches to developing pre-service teachers' self-awareness and divergent thinking. I provide a synthesis and critique of the empirical research around the use of problem-based learning for teacher development, discussing how

these previous empirical studies influenced my research design around the implementation of a problem-based learning curriculum. In particular, this work looks to explore these guiding questions:

- What does existing research identify as critical elements for teacher preparation?
- What does existing research identify as the gaps in current approaches to pre-service teacher development?
- What is problem-based learning, and how might it fill the gaps in current approaches to pre-service teacher development?

### **Developing Pre-Service Teachers**

In this section, I summarize some of the research surrounding key aspects of teacher development. I begin by focusing on self-awareness and divergent thinking as skills for pre-service teachers to be able to evaluate the structures of and approaches to PreK-12 education as well as to see themselves in the role of teacher within these contexts. I then summarize some of the research around pre-service teachers' self awareness and development of professional, humanizing dispositions. Finally, I discuss what the research says pre-service teachers might need in order to better understand multicultural education and to hone their skills as multicultural educators.

#### **Self-Awareness and Divergent Thinking**

The process of learning about pedagogy, curriculum and what it means to “be” a teacher involves more than acquiring information or collecting facts. An important aspect of the construction of a teacher involves the construction of self-as-teacher, through engagement with opportunities for self-awareness and divergent thinking. As opposed to convergent thinking, which follows a set of accepted steps to arrive at one solution, divergent thinking is free-flowing

and generates many possible solutions. Divergent thinking is the ability to see many possible ways for interpreting a question and to see many possible answers to a question, not just one (Robinson, 2010, 2011). Additionally, Fasko (2000), in his research on developing creativity and divergent thinking skills, asserts that experience with discovery learning forces the learner “to manipulate the environment and produce new ideas” (p. 320). With the development of divergent thinking comes the ability to consider information from multiple sources. Teachers who are able to think divergently can accomplish change through thinking about many possible approaches or solutions and anticipate potential pitfalls. Guilford (1972) contends that the transformation abilities (revising one’s experiences to produce new patterns of thought) that result from a learner’s engagement in divergent thinking are important because they increase students’ flexibility in thinking and lead to the production of more new ideas. In effect, divergent-thinking teachers are able to approach, think through and solve problems independently and with confidence (Pajak, 2000). These teachers also are able to recognize that their identities are perpetually under construction, as they confront their changing realities and multiple influences. They use this self-awareness to better understand education as a profession, making decisions based on analysis and interpretation of information and inferences from a variety of sources and their own experiences (Bauman, 2006; Pajak, 2000).

Engaging in opportunities to reflect on the current structures of and approaches to education has the potential for pre-service teachers to begin to see themselves as playing a significant role in the change that will provide a better education to students in the PreK-12 setting. A necessary component of the development of pre-service teacher identity(ies), then, parallels Freire’s concept of praxis, in that both reflection upon and action within the world are necessary for transformation and change (Freire, 1996, 2004, 2005). As Freire would contend,

pre-service teachers need to have a stake in the struggle to define themselves as educators if they are to be committed to working to make change. Similarly, Ferri (2006) asserts that pre-service teachers need to be able to think critically about their own previous learning and development to begin to see what has influenced them and how their experiences might inform their questions about and goals for education. Embedded within this process are the discovery, understanding and refinement of professional dispositions as the core of teacher identity. As Diez and Murrell Jr. (2010) note, “because moral perspectives are strengthened in reflection, teacher educators also need to help teacher candidates become aware of their values and belief systems, and how they influence their choices of action” (p. 12).

### **Identity and the Development of Dispositions**

A central task, then, of teacher preparation is to provide opportunities for prospective teachers to understand how their values have evolved and how their present values apply to teaching and learning. Professional dispositions at their deepest relate to the ethical and moral foundations of education, including teaching, learning and the theoretical foundations upon which schools are built (Diez & Murrell Jr., 2010).

As I began puzzling through what dispositions include, how they are assessed and how contexts influence their development, I uncovered differences. For some, dispositions are defined as specific kinds of actions and their frequency as opposed to a set of beliefs or attitudes (Katz & Raths, 1985). Others view dispositions “as habits of professional action or moral commitments that spur such actions” (Diez & Murrell Jr., 2010, p. 9). While difficult to find literature that agrees on one definition of dispositions, there is a pattern that emerges, linking dispositions to knowledge and skills. In other words, professional dispositions represent the melding of beliefs (“all students can learn”) with the knowledge and skills to be able to act on the belief

(differentiating instruction to meet the unique needs of learners so that all students can learn), along with the “moral commitments to spur such actions” (Diez & Murrell Jr., 2010, p. 9).

Salazar, Lowenstein, and Brill (2010) contend that the dispositions most critical to developing teachers are humanizing dispositions, the “...attitudes, values, and beliefs that advance the dignity, humanity, and achievement of culturally and linguistically diverse learners” (p. 29). These authors assert that the cultivation of humanizing dispositions needs to be integrated into the complex *process* of the construction of self-as-teacher. The process is one of cultivation through conceptual understanding, refinement through guided application, and thoughtful reflection practice (Diez & Murrell Jr., 2010). Raising pre-service teachers’ conceptual understandings might occur through exposure to lectures, presentations and textbooks. However, pre-service teacher candidates need active and direct involvement in the situations and problems that would allow them to be aware of their humanizing dispositions, as they relate to professional contexts, if they are to experience the stages of guided application and thoughtful reflection on practice, to which Diez and Murrell Jr. refer.

An understanding of humanizing dispositions is critical in order to further develop skills and knowledge, and, conversely, the process of developing knowledge and skills can contribute to the awareness and cultivation of dispositions (Hollon, Kolis, McIntyre, Stephens, & Battalio, 2010). Researchers of teacher development assert, if pre-service teachers’ humanizing dispositions are at the heart of the construction of self-as-teacher, the types of experiences pre-service teachers have need to be carefully and purposefully developed to allow for opportunities to foster the dispositions for inquiry, collegiality, setting and maintaining high expectations, and cultural responsiveness (Fallona & Canniff, 2010; Feiman-Nemser & Schussler, 2010). As Pajak (2000) contends, “if teachers are to develop the capacity and motivation to initiate inquiry or the

skills to analyze their own teaching independently...they need practice in doing so from the very start” (p. 34).

This type of shift in how schools of education approach preparing prospective teachers necessitates a shift in the management of learning, a shift from control to guidance. Grant and Zozakiewicz (1995) identify the need for pre-service teacher candidates to learn how to develop their own questions for inquiry, rather than relying on questions posed by teachers/professors. Additionally, they speak to the need for pre-service teachers to learn how to challenge sources of authority, rather than accepting discourses as truth without thinking critically about them. These are both important skills in the construction of teachers. Ladson-Billings (1995) shares an example from a culturally relevant classroom that highlights the importance of looking at whose voice governs learning: “... the teacher would offer an explanation and then ask, ‘Are you satisfied with that answer?’ If a student said ‘Yes,’ she might say, ‘You shouldn’t be. Just because I’m the teacher doesn’t mean I’m always right’ (p. 473). Related, Diez and Murrell Jr. (2010) assert that pre-service teacher candidates need to know and believe that there is not a set of expected dispositions that need to be acquired; they need to be free from the pressure to conform to what they believe faculty need or want to hear. Ultimately, these authors contend that pre-service teachers need spaces to explore what it means – *to them* – to be a teacher, inclusive of what they value and believe and how those values and beliefs manifest as professional dispositions.

The existing tension is one around *perceived indoctrination* and *formation or transformation* of pre-service teachers. The former speaks to the imposition of the professor’s (or cooperating teacher’s) values and beliefs on the pre-service teacher, and the latter speaks to bringing pre-service teachers into contexts and professional environments that allow them to

uncover their own values and beliefs and to recognize the place of both within the professional environment (Diez & Murrell Jr., 2010). At the core, indoctrination is rooted in the one voice of authority, and the formation or transformation of the pre-service teacher requires a process of coming to know oneself as teacher through meaningful dialogue between and among various individuals. It is a process of internalization that simply cannot occur through a mechanical imposition (Ball, 2006; Ladson-Billings, 1995).

Shifting from indoctrination to a more formative and dialogic learning environment creates opportunities for pre-service teachers to uncover and examine their values and preconceptions (Feiman-Nemser & Schussler, 2010), allowing for the development of humanizing dispositions so critical to the formation of teacher identity. Such a transformative space relies heavily upon inquiry and investigation, so that as pre-service teachers move into the ranks of professionals, their actions and choices in the classroom, made from the core of their identity, create the type of environment needed for their young students' identities to take shape as well (Levinson, 2000).

Some of the research around humanizing dispositions (Gorski et al., 2013; Murrell Jr., Diez, Feiman-Nemser, & Schussler, 2010) is predicated on the idea that the core of teachers' humanizing dispositions needs to be built upon a commitment to multicultural education. In order for pre-service teachers to engage in the possibilities of multicultural education, however, they need more than brief and isolated experiences with issues concerning race, class, gender, sexual orientation and ability (Gorski, Zenkov, Osei-Kofi, & Sapp, 2013). Humanizing dispositions well-suited to multicultural education are cultivated through experiences with marginalization as the focal point, not the add-on (Stovall, 2013). Determining the impact of a pre-service teacher's previous experiences on his/her understanding of and development of

dispositions as well as the effect of field experiences as potential contexts in which dispositions can be cultivated and fostered emerges as problematic. The following section will explore how the formation of teacher identity correlates with the development of multicultural, social justice change agents in the classroom.

### **Identity Formation and Multicultural Education**

While multicultural education does not come “packaged” as a specific type of curriculum to implement, the strategies at its foundation encourage students to develop the ideas, processes, skills and ways of thinking necessary to recognize social injustices on a local, regional, national and global scale and effect change. Education is situated within and intertwined with the political, economic, and cultural aspects of everyday life. As Levinson (2000) would contend, prospective teachers need to envision themselves within this situated human activity and understand what role they will play.

Education does not exist in isolation. Its structure often parallels society as a whole, and the construction of knowledge occurring within the school also tends to be socially (re)produced (McCarty, 2002). In order for teachers to fully grasp how they might be situated within these socially produced spaces, they need opportunities to reflect on the ways their own education has shaped and influenced them. They also need to be able to envision how they will function within the space as a professional, particularly with the goal of multicultural education and effecting social change (Ball, 2006; Gorski et al., 2013; International Alliance of Leading Education Institutes, 2008; McIntyre & Byrd, 2000; Noel, 2008).

A study by Grant and Zozakiewicz (1995) found that most student teachers did not change or adapt curriculum or their class practices to support a variety of multicultural perspectives. For the few student teachers who did attempt to integrate multicultural education

into their curriculum and teaching practices, the activities only focused on facts, fairs, foods, festivals and heroes/heroines for different cultures in isolation. This type of integration does not reflect a multicultural education orientation that addresses social justice issues or empowerment for change. The conclusion Grant and Zozakiewicz drew is that many student teachers equate multicultural education with the human relations view (one limited to the exploration of foods and fairs). As a result, their teaching practices demonstrate (and their expectations of students indicate) the need to accept one another and to learn to get along, but the work does not go any deeper. Noel (2008) would contend that before prospective teachers begin student teaching they need to be immersed in situations that will empower them to pursue classroom goals of cultural pluralism, equity and social justice. By giving students a stake in problems dealing with social injustices, derived from local, regional, national or global contexts, and coaching them to work through the problems as they engage in inquiry and collaboration, pre-service teachers can learn about real problems. They can hone the skills, processes and ways of thinking necessary to effect change with respect to these real problems. The International Alliance of Leading Education Institutes (2008) and researchers such as Larkin and Sleeter (1995) identify the need for pre-service teachers to problematize teaching and ask questions about the nature of student-teacher relationships, curriculum, schooling and society. This process of cultivating multicultural education does not happen in isolated human relations courses or in add-on courses to the core education sequence (Gorski et al., 2013; Ladson-Billings, 1995); learning how to foster diversity within a multicultural context requires a deep self-awareness, divergent thinking and humanizing dispositions developed consistently over the course of the teacher preparation program (Larkin & Sleeter, 1995; Noel, 2008).

For pre-service teachers to fully develop a multicultural education orientation, they need to understand themselves through both retrospective reflection and introspective self-examination (Grant & Zozakiewicz, 1995). Both retrospection and introspection become more meaningful to pre-service teachers if they are given the opportunity to grapple with problems facing education and society today. Teacher candidates need to be actively involved in the process of exploring problems, because, as Orlofsky (2001) notes, more can be internalized through doing, rather than reading about, hearing about or thinking about doing. Through inquiry into these problems, pre-service teachers learn to identify and address power imbalances that exist within schools. They learn how to become readers of power from reflecting on how they have been influenced by educational contexts as well as on their potential influence as teachers (Allan, 2008; Ball, 2006). Often, as Blumenfeld (2013) points out, many pre-service teachers understand issues of power, control and oppression, but their view of the issues remains too limited. They have trouble seeing the larger, more complex issues; Orlofsky (2001) asserts that they need opportunities to expose and think critically about the societal and institutional foundations of oppression, even if the process is uncomfortable.

In essence, the goal, through retrospection and introspection, is for pre-service teachers to gain a clearer sense of their evolving identity(ies) and of their role in PreK-12 education. With a clearer sense of their identity(ies), they can make informed decisions when planning for, implementing and assessing instruction within a multicultural education setting (Noel, 2008). With a clearer sense of the educational contexts they will enter, they are also more likely to understand what forces influence planning, implementing and assessing instruction, realizing that, “teaching methods are related with complex issues regarding the nature of student knowledge and teacher knowledge, the classroom environment, school policies and society, and

what may constitute worthwhile knowledge and interaction” (Tochon, 2011, p. 13). With greater understanding of the connections between the social, political and economic forces shaping education, pre-service teachers can respond to the root causes of inequities, rather than the symptoms of injustice (Noel, 2008; Orlofsky, 2001; Osei-Kofi, 2013). After all, the goal for pre-service teacher candidates goes beyond simply *knowing about* multicultural education; the goal is for them to be able to *apply what they know* to the real contexts where they will teach.

An important part of becoming a reader of power is to be able to have discussions about cultural identity(ies), beyond the dichotomous black-white discussion, and to delve into and explore all of what comprises one’s culture (attitudes, values, beliefs, behaviors and norms). Included in these discussions and explorations can be an opportunity to examine what it means to be White, especially since the body of pre-service teachers is still dominated by White students (typically female). Perry (2002) explains, “This new multiculturalism, which might be called ‘critical multiculturalism,’ would be inclusive of White students and possibly have the most profound impact on them. White youth would be challenged to critically examine and deconstruct what being ‘white’ means to them” (p. 197). Gorski et al. (2013) assert that in order to read power, pre-service teachers need opportunities to think critically about culture and society – ethnicity, gender, class, sexual orientation and the like – and seek out the counternarratives that often remain hidden from pre-service teachers. Culture informs pre-service teachers’ worldview and identity (Ball, 2006; Larkin & Sleeter, 1995), and this identity ultimately becomes their professional identity.

As Ball (2006) notes, to be able to teach a diverse group of students, pre-service teachers need to resist the tendency to find fault or deficits in the children. Instead, she advocates for the need to turn their attention to the weaknesses in school structures and how teachers can better

serve diverse students as well as to envision how they, as teachers, can fit into the context of a multicultural classroom setting. During teacher preparation, the prospective teachers can identify the parts of themselves on which they wish or need to work, examine the current rules and roles of PreK-12 education, set goals accordingly and then work toward those goals (Allan, 2008). This type of work gives pre-service teachers practice with recognizing how schools and teachers are not fulfilling their obligations to meet the needs of all of their students and to think about how they can build a classroom environment and school culture where diversity is embraced, celebrated and affirmed (Allan, 2008; Johnson, Evers, & Vare, 2010). Then, as teacher education shifts its focus and purpose, and as pre-service teachers enter the field as practicing teachers, their influence on PreK-12 education begins to shift how all educators approach teaching and learning, with an orientation toward multicultural education (Noel, 2008).

From reviewing what scholars say about developing pre-service teachers, certain patterns emerge. Teacher educators need to create spaces for pre-service teachers to critically examine the field of education, through unearthing counternarratives, unpacking the social construction of self and others, and discovering the complexities of what is happening in schools; to develop their self-awareness; and to discover their own voices and identities as multicultural educators and change agents. Further, teacher educators need to engage pre-service teachers in inquiry, ask them to prepare for and contribute to critical discussions, encourage connections with neighborhood schools and communities, and, ultimately, encourage them to confront the discomfort that surfaces as a result of exploring the unfamiliar. Teacher educators should seek solutions rather than a conclusion from their students; they should ask their students to delve into the complexities of self and others to foster the dispositions and affect of committed multicultural educators, and they should work with the goal of efficacy in mind, the efficacy that

grows not from dependence on the authority of professorship, but from experience, introspection, and understanding of how to serve all students equitably.

The above research demonstrates links together issues of self-awareness, divergent thinking and humanizing dispositions toward multicultural education. While this research justifies the importance of these skills and dispositions, it has not yet addressed whether current approaches to preparing pre-service teachers meet the needs identified. The next section of this chapter seeks to identify what scholars say about many of the existing approaches to developing pre-service teachers, teacher identity(ies) and what pre-service teachers see as their role in PreK-12 educational settings.

### **Current Approaches to Developing Pre-Service Teachers**

In this section, I begin by presenting the research around the ways current approaches to education serve to control and manage the learners for particular purposes. In doing so, I examine who is most active, the teacher or the learner, within the current structures. I then explore what the research says about mimicry and the perpetuation of the status quo in current approaches to developing pre-service teachers. Finally, I outline what researchers say needs to change in the ways pre-service teachers are prepared.

### **Control and Management**

Scholars (Allan, 2008; Tait, 2011; Valdés, 1996) identify some types of control and methods to manage learners that inherently exist within the structure of courses, the approaches to curriculum and the roles of teachers. They contend that schools (PreK-12, and, by extension, post-secondary institutions) have long been recognized as sites where teachers and the curriculum function to control students in order to produce a certain type of individual to serve a pre-determined purpose outside of the school. Additionally, they identify the hegemonic-state

reproductive model as the one that often guides the approaches of educational institutions and, therefore, the identities of those learning within the institutions. The root of the control, according to their research, can be traced back to the presumption that the teacher/professor is the sole expert and authority. If PreK-12 teachers are meant to manage their students, the premise has been that the construction of PreK-12 teachers ought to be carefully controlled in a way that would prepare them to serve in that capacity. The teacher/professor has become the expert managing authority and the one to control what information and solutions are accessible.

Pre-service teachers can be managed or controlled by convincing them that the teacher/professor knows what is important to learn, has selected the best sources of information and will pose the necessary questions to consider. Through repeated exposure to this approach, learners have accepted it as typical, appropriate, status quo – certainly not cause for concern. It is commonplace that in most learning environments, the teacher/professor creates lesson plans, unit plans, course calendars and syllabi. In those plans, it is the teacher/professor who chooses what is most important to learn (or cover, as the case may be). The teacher/professor selects the textbooks and other materials to be used throughout the course and decides what learners will read and “do” with what they are reading. In schools of education, where pre-service teachers might have field placements or practicum, a placement coordinator or another member of the faculty determines where the pre-service teacher will be placed, who will serve as the cooperating teacher, what the pre-service teacher should observe, how he/she should be involved in the classroom, and how long the pre-service teacher should spend there. These structures and processes have become so commonplace, it typically is not cause for concern; it simply is and has been “the way it is done.”

The question, however, is whether these structures and processes are effective when it comes to what we know about the research on what pre-service teachers need to develop as they begin to think about their role in PreK-12 educational settings. Do the commonplace approaches for preparing teachers provide the types of opportunities pre-service teachers need to develop self-awareness, divergent thinking, and the humanizing dispositions oriented toward multicultural education? A look at additional research points more toward the flaws of the current structures of, processes for and approaches to developing pre-service teachers' identity(ies) and thoughts about their role PreK-12 education.

There is a certain degree of passivity when pre-service teachers participate in courses that are entirely designed by the teacher/professor. It is clear to most that when pre-service teachers are learning about pedagogy and schools through listening to lectures and reading textbooks about education, they are explicitly passive in their learning experience. However, even when students become more active in their learning experiences, there is still a certain degree of passivity when the questions to be considered and the topics to be explored are already determined for them by the teacher/professor. In essence, they become subjected to a certain type of control and management (Campbell, 1999).

When teachers/professors limit their students by determining their required texts and a outlining a rigid calendar of topics to cover, they are ensuring pre-service teachers will learn what they, as the authority, have deemed most important. In this way, teachers/professors ultimately determine what *counts* as knowledge. Through these foundational structures and approaches, teachers/professors send messages about how teaching and learning should be organized, who or what a teacher should "be" or "do," and who is allowed a voice in the construction of learning – who is allowed to ask the questions that will shape the direction of the

teaching and learning experiences and what resources will provide the acceptable information. While more subtle than the passive receipt of lectured information, learners within these types of structures are still subject to a degree of dominance and are managed into a degree of subordination (Apple, 1996; Stiker, 2002; Tait, 2011). The set curriculum and the types of learning opportunities offered serve as a form of management of and control over prospective teachers' development. They are, essentially, bound to the information chosen by an authority figure (Henry, 2000) and not engaged in the type of work necessary to fully develop their self-awareness, divergent thinking and humanizing dispositions oriented toward multicultural education.

It needs to be noted that all pre-professional programs have the responsibility to introduce its learners to the foundational frameworks and the language of the discipline. Removing all of the structures typically built into the more traditional approaches to teaching and learning, those with professor-directed foci, could prove to be detrimental to the learners' overall development and preparation. It is important to recognize the ways traditional approaches manage and control learners, but it is just as important to recognize when management and control might be beneficial in order to efficiently orient learners to a field and inform them of a body of literature with which they are, likely, unfamiliar. Similarly, it is important to recognize the potential benefits of approaching teaching and learning in ways that reduce or eliminate the typical management and control, and when it might be acceptable to allow learners the opportunity to choose and explore their own questions and sources of information as they develop.

### **Mimicry and the Status Quo**

Within a system of management, control, and regulation, the goal for the development of pre-service teachers is to create sameness, and the goal from the perspective of the pre-service

teacher is to be the same as everyone else. Even if the “sameness” is that of excellence, the pre-service teachers’ development remains bound and limited by the processes that create and expect conformity (Allan, 2008; Stiker, 2002). When the learners are not given the opportunity to inquire, they do not learn how to evaluate and critique the very system they will enter. Without inquiry, evaluation and critique, pre-service teachers remain constrained by the teachers/professors who have decided what is important to learn and know as well as who they should “be.”

Students (pre-service teachers) often approach learning situations with a certain level of trust in the expertise of professors and their chosen course readings. From this trust comes a tendency for them to think that if they start reciting what the professor says or start repeating what they read in the course texts, they are providing evidence that they have adopted the “accepted” or the “correct” knowledge and perspectives, projecting their learning of the material. They seem to be less inclined to develop independent thoughts because they see themselves as novices and have no reason to doubt the authority figure. In these ways, even when professors do not explicitly ask for students to mimic (and even if their goal is to generate thinking, personal connections, and internalization of material), learning to be a teacher within a professor-controlled learning environment implicitly encourages mimicking sources of authority, through what is read and what is said during lectures. In essence, the current structures within which pre-service teachers are developing promote acquiescence rather than originality (Henry, 2000), and rarely are minds stimulated beyond the energy required to mimic the discourses encountered. For example, Orlofsky (2001) found that her education students often gave safe and clichéd answers to questions she would pose, ultimately shying away from expressing any passion for or meditation on important questions. What results is a great divide between “learning” and

“thinking” (Dudley-Marling, 2013; Jones & Woglom, 2013; Orlofsky, 2001) in teacher education courses. Rios and Gonzalez (1995) note that this separation is a result of the teacher educator being constructed as an authority and an expectation that teacher education candidates conform to the authority.

The social or relational view of identity contends that identity is constructed from discourse. Power relations play an important part in the construction of discourses, as discourses result from relationships between participants, and each of those participants has a certain relationship to larger structures of power and control (Linde, 1993; Mishler, 1999). In effect, the closer to the larger structure of power and control (such as a teacher/professor or the author of a textbook chosen for a course, the perceived “experts”), the more weight that individual’s discourses tend to carry. Those individuals with less power (such as the pre-service teacher, the perceived “novice”) tend to accept the powerful discourses as the Truth or the only acceptable values, beliefs or knowledge. Especially very early in pre-service teachers’ development, in cases where the student lacks experience in the field and is unaware of the language of the discipline, the novice tends to mimic lectures, presentations and readings, without necessarily internalizing them, as internalizing them would require inquiry into and exploration of them. As a result, pre-service teachers conform to the authority’s projected image of teacher, rather than an individually constructing their identity through self-awareness and divergent thinking.

The limiting effect of the power relations on students’ thinking and identity formation can be seen through an observation Nathan (2005) made during her study of college freshmen:

...I was struck by the realization that, despite official assertions about the university as a free marketplace of ideas, the classroom doesn’t often work that way in practice. Ideas are rarely debated, and even more rarely evaluated. Most classroom discussion, when it

does occur, could be described as a sequential expression of opinion, spurred directly by a question or scenario devised by the teacher, which is subject to little or no commentary.

(p. 95)

Similarly, Dudley-Marling (2013), in his research on overcoming deficit thinking as a cognitive bottleneck, found that discussions in college classrooms are often led by teachers/professors who encourage recitations of previous discourses and expect to hear predetermined answers from students. It is not uncommon to find pre-service teachers who remain ignorant to the considerations of the students and communities where they will teach; if the pre-service teachers can regurgitate the readings and the teacher/professor notes, they are considered to be successfully progressing in their development (Johnson et al., 2010). Jones and Woglom (2013) point out that teacher education candidates are smart, in that they have learned to read, write, speak about and represent their ideas according to the structures, practices and expectations of the teacher educators and educational institutions. These authors note that those students who have learned to navigate these particular structures, which emphasize required texts and suppressed creativity, are deemed the “good students” and are rewarded accordingly. Pre-service teachers believe they are learning and even seem to be convinced that what they are parroting reflects their beliefs and professional identity, likely because they are not aware of what their beliefs or identity might be if they were allowed to engage with the material in different ways (Mirzoeff, 2009).

Pre-service teachers learn to parrot discourses without thinking critically about them starting with their own PreK-12 education, possibly because they believe the parroting behavior is what is expected of them, essentially, that this behavior is a demonstration of learning (Johnson Lachuk & Gomez, 2013; Perry, 2002). Additionally, learners have not always been

given all of the information (or the opportunities to acquire the information) that they would need to be able to form an independent opinion. They are also typically not self-aware; they do not know what they are missing if they have come to expect the way it has always been as the way it should be.

Within these types of learning environments, prospective teachers are “lured away from forms of inquiry which problematise... towards *what works*. This is of little use because it assumes such complex phenomena are understood, when they are not, and seeks to find solutions which can be packaged and disseminated to teachers and others” (Allan, 2008, p. 49). The learning environment lacks the authenticity of the roles and environment where pre-service teachers will teach (Levinson, 2000). Identity formation is limited to what is made available to the pre-service teacher and limited by those making the choices of what ought to be taught to and learned as pre-service teachers. To break the cycle of mimicry, Pajak (2000) contends that pre-service teachers need to be given a voice in what questions to pursue and what sources of information are valuable, allowing them a real stake in their development. Rather than absorption and replication, pre-service teachers might instead experiment with pedagogy, content and curriculum; they might grapple with authentic challenges facing those in the teaching profession and defend their conclusions; and they might diversify their readings (Allan, 2008).

While avoiding discourses altogether is likely impossible (and also unnecessary), pre-service teachers can be offered an environment that allows them to supplement the discourses, to expand the discourses and open up the discourses for critique and evaluation, in ways that discourage mimicry and release the control that perpetuates the need to do “what has always been done.”

## **The Need for Change**

To supplement the research done to discover the gaps in pre-service teacher development, many of the above researchers go on to discuss the new role of the teacher educator. The pattern that emerges is one emphasized by Orlofsky (2001), that the role of the teacher educator needs to shift away from being in control of the pre-service teachers' learning and development to helping them navigate the terrain. Dudley-Marling (2013) talks of his need to remind himself that there are no right answers because the right answer is derived from the notion of a predetermined meaning, often the teacher educator's meaning. Instead, he sees his role as needing to push students' thinking about challenging texts and concepts, specifically through the use of Interpretive Discussion as a strategy to help his pre-service teachers overcome deficit thinking. Gorski (2000) refers to a similar shift in his thinking. In his strategies to overcome the cognitive bottleneck of essentialism in teacher education courses, Gorski talks about the strategies to reveal his students' "mental models" (p. 88) rather than correcting their thinking as the authority in the course. He notes the difference in his role as the one to impose ideas upon students versus his role as a guide, facilitating students' own work in making connections. The ways Gorski reformed his role as teacher educator echoes the change Orlofsky proposes and parallels the changes Dudley-Marling makes in his thinking as well.

Another common element to the reformation of the teacher educator's role is emphasized by the work Kochan (2000) has done around the need for teacher educators to become co-learners in their experiences with pre-service teachers. This change of mindset and approach to teaching and learning validates the experiences and inquiries of the pre-service teacher, dissolving the boundaries between expert and novice. Within this structure, the learner can

become immersed in the kind of divergent thinking and self-awareness that undergird an orientation to multicultural education.

The common thread among these researchers' studies (Dudley-Marling, 2013; Gorski, 2000; Kochan, 2000; Orlofsky, 2001) refers to the need for teacher educators to relinquish their control over the material, the discourses, and, ultimately, the learning of pre-service teachers to allow for spaces for them to develop their own voices and to become active in determining what and how to learn. Curricula driven by the teacher as an authoritative voice ultimately impact learning differently than curricula driven by students as an authoritative voice (or students and teachers with a shared authoritative voice). A problem-based learning curriculum is one type of curriculum that supports a shift in authority.

### **Problem Based Learning and Teacher Development**

In the following section, I provide information about problem-based learning, including its roots and unique characteristics, before discussing the types of research done on problem-based learning in postsecondary education. I conclude the article with a discussion of the potential for problem-based learning for pre-service teacher development.

#### **Background on Problem-Based Learning**

Problem-based learning was introduced at McMaster University in Canada as an instructional method undergirding a tutorial process that would promote a student-centered and multidisciplinary approach to the application of theory in medical school (Barrows & Tamblyn, 1980; Duch, Groh, & Allen, 2001). Since its introduction in the medical school context, problem-based learning continues to be used in medical education courses and has been implemented in undergraduate programs for business, engineering, architecture, economics and

education, as well as in PreK-12 education (Duch et al., 2001; Edwards & Hammer, 2004; Savery, 2006).

The goal of problem-based learning in any context is to foster in students the ability to think critically, solve problems effectively, find and evaluate relevant resources, work collaboratively, develop communication skills, and work to become self-directed and continual learners (Duch et al., 2001; Edwards & Hammer, 2004; Savery, 2006). At its core, problem-based learning relies upon the “ill-structured problem,” modeled after authentic problems students would likely face in the field, to motivate students to engage in free inquiry. The ill-structured problem scenario requires that students work collaboratively and engage in reanalysis of the problem and of the information gathered during the research process. The problem scenario is messy and incomplete, and students are responsible for asking questions, determining and seeking out resources, and discovering the complexities of “real world” problems. Teachers/professors take on the role of tutor, relinquishing the authoritative voice in the classroom, monitoring students’ progress and assessing their work, but not providing information or a definitive route to take to construct a solution to the problem (Duch et al., 2001; Levin, 2001; Savery, 2006).

Some of the core elements of problem-based learning resemble those of other types of student-centered or constructivist learning, namely project-based learning, inquiry-based learning, and case-based learning (Levin, 2001; Savery, 2006). For project-based learning, learners are given a specific end product they have to create, and the process is typically focused on following procedures to construct one type of end product, whereas in problem-based learning the end product is as open-ended as the approach to get there, with the responsibility resting with students to determine the best course of action and the best way to represent the solution(s) to the

problem. For inquiry-based learning, the teacher/professor not only facilitates thinking through questioning and developing higher-order thinking from students, but s/he also provides information to students, whereas in a problem-based learning curriculum, the responsibility for finding information belongs completely to the students. With case-based learning, the goals and outcomes for defining a problem are provided explicitly to the students, and the students learn within set parameters, whereas in problem-based learning the foundation for motivating students to engage rests with removing parameters and allowing the goals and outcomes to be determined by the students. It is the students' responsibility to define the problem and determine the solution(s).

### **Existing Studies on Problem-Based Learning for Teacher Preparation**

Much of the research that exists on problem-based learning (as opposed to project-based, inquiry-based or case-based learning) focuses on its application within medical education courses, since its origins began in the medical field and the problem-based learning curriculum has garnered the most respect within that field. As for studies of a problem-based learning curriculum in teacher education, the research is either misrepresented as problem-based learning (when it is actually project-based, inquiry-based, or case-based learning) or extremely limited, due its rarity in implementation in this field at this time. More plentiful research exists around inquiry-based and project-based learning. For example, Braaten's (2011) work focuses on the use of collaborative inquiry, specifically a science teacher video club, as a means of professional development of teachers' inquiry stance and professional practice. Albion and Gibson's work explores how combining an Interactive Multimedia (IMM) model with a Problem-Based Learning model assists teachers in learning to integrate technology into their practice; however, the work presented is that of a Project-Based Learning model, combined with IMM. The research

that does exist primarily focuses on students' perceptions of problem-based learning as a curriculum, specifically the benefits of this type of learning and/or the frustrations or barriers they encountered while experiencing problem-based learning for the first time (Duch et al., 2001).

McPhee's (2002) qualitative research study has a two-fold focus: the study evaluated the connection between a problem-based learning curriculum and pre-service teachers' motivation to learn the material and difficulties encountered along the way as well as how a problem-based learning curriculum might or might not improve performance in practicum experiences. Data was collected through the use of questionnaires covering issues around students' prior experiences with "issues based learning," team work and interactive skills, student motivation and understanding, and perceived advantages and disadvantages of using "issues based learning." McPhee found that few students had previous experience with this type of learning, many enjoyed working within groups and found the process more motivating than a non-"issues based" curriculum, and some free response statements indicated that students found the process helpful in preparing them for the classroom. However, the study does not illuminate the specific ways a problem-based learning process can stimulate thinking about what is possible in a PreK-12 classroom or how pre-service teachers thought about themselves as teachers. Additionally, McPhee sought to determine patterns among students, specifically with respect to increased motivation. A narrative study into individuals' experiences with problem-based learning affords me the opportunity to explore the specific ways a problem-based learning process affects the ways pre-service teachers think about themselves and the context of teaching, a gap in McPhee's research.

Similarly, Edwards's and Hammer's (2004) study focuses pre-service teachers' barriers to learning within a problem-based learning curriculum as well as their recommendations for using problem-based learning in future course offerings. They uncover issues with group dynamics, such as students not attending group meetings on a consistent basis or students encountering their peers' fixed ideas, frustrations with the open-ended and continually changing nature of problem-based learning, and confusion with not understanding expectations of them or understanding the roles they were supposed to be playing within the context of the problem-scenario. They also found, despite students' frustrations with the curriculum, that the majority of the pre-service teachers found a problem-based learning curriculum to be realistic and empowering and allowed them opportunities to develop and practice necessary skills beyond the study of theory. Edwards and Hammer (2004) also looked to the wide-spread benefits of a problem-based learning curriculum, including the development of problem-solving and communication skills as well as the ability to locate and evaluate relevant information. The data from this qualitative research study emerged from the analysis of responses to a ten-statement questionnaire, using a five-point Likert scale. The data was then calculated into percentages in order to determine a mean response. Ultimately, the researchers sought to answer two qualitative questions: 1) "What were the issues, frustrations or difficulties that you faced by participating [in] the Problem Based Learning Scenario?" and "Do you recommend that Problem Based Learning be used in this unit next year?" I found the use of the questionnaires and the Likert scale to be too limiting in terms of analyzing the impact of a problem-based learning approach on pre-service teachers' developing perceptions of PreK-12 education and their role as a PreK-12 teacher. I also found that a focus on the frustrations encountered (specifically with the process itself and not with the information that participants may or many not have uncovered through

their research) did not provide the space for analyzing how the process impacts teacher development and thinking.

Levin's (2001) compilation of teacher educators' experiences with problem-based learning in professional development settings explores the context, purpose and description of the problem-based learning assignment as well as the instructors' roles, assessment opportunities, outcomes, problems encountered and suggestions for other teacher educators. Most of the examples provided focus on work with practicing teachers, as opposed to pre-service teachers, and describe how the teacher educators use week(s)-long workshops, as opposed to semester-long education courses, for the implementation of the problem-based learning curriculum. This research is based on narrative accounts from the point of view of the instructors who had implemented a problem-based learning curriculum. My work seeks to explore the narratives from the students' points of view.

Murray-Harvey and Slee (2000) focus their qualitative research study on the ways a problem-based learning curriculum supports pre-service teachers in learning about theory and helps them to learn how to work with others professionally. They found that pre-service teachers developed important collaboration skills. While the data did not strongly support an increased knowledge or understanding of theory, the authors did find that pre-service teachers were applying theoretical concepts in the course of their problem-based work. These researchers had in mind specific theoretical concepts they wanted their students to master, which is much more concrete than exploring how a problem-based learning curriculum impacts pre-service teachers' thoughts about what is possible to achieve in PreK-12 contexts as well as how they see themselves. My narrative research study seeks a more personalized exploration of how the problem-based learning process impacted individual students, while Murray-Harvey and Slee's

work centers on determining the patterns behind students who did or did not master theoretical concepts.

Most of the existing research on problem-based learning either focuses on students' attitudes about problem-based learning or focuses on the impact of this curriculum in medical education (Duch et al., 2001). Additional research is needed on how a problem-based learning curriculum impacts pre-service teachers' development and their thinking about their role in multicultural education.

### **The Potential for Problem-Based Learning**

From the research presented earlier in this paper, there is an identified need for prospective teachers to have opportunities to think about and evaluate the current structures of and practices in PreK-12 education as part of their development. There exists a potential shift away from thinking of teaching as a “science” or as a set of skills that can be passed on or acquired through controlled dissemination of information. The increasing emphasis on and perpetuation of *what works* encourages dichotomies of expert authority and ignorant novice, encourages mimicry and expects sameness (Allan, 2008). These notions discourage processes critical for developing self-awareness, divergent thinking and humanizing dispositions oriented toward multicultural education. The pre-service teachers might come from their teacher preparation program able to parrot certain discourses but are less likely to have a deep understanding of what it means *for them* to be a teacher and what *they* see as their role in PreK-12 education.

Speaking of problem-based learning, Checkley (1997) contends, “Only in school...are students given well-structured problems that do little to inspire self-directed inquiry. What students should be given instead...are *ill-structured* problems – problems that give students just

enough information to guide an investigation” (p. 110). These ill-structured problems, the foundation of a problem-based learning curriculum, can and should be situated in the contexts of their use; the contexts into which pre-service teachers will soon enter; the contexts pre-service teachers should have the opportunity to experience, to evaluate, and to question (Duch et al., 2001). Levinson (2000) found that “...the formality of institutional knowledge [results in]... the persistent separation of schools from the vital ‘communities of practice’ outside them. Our task as students, educators, and educational researchers is to boldly situate the knowledge generated in schools within broader streams of social practice and learning” (p. 6).

Using a problem-based learning curriculum instead of a “fixed” curriculum creates a certain element of uncertainty because the total direction the learners take is not and should not be controlled by the teacher/professor. This uncertainty can create discomfort or anxiety in the teacher/professor and/or in the learner because it is, for most, uncharted territory and more free than teaching and learning has ever been. There are no definitive, preconceived notions students must adopt. While new and potentially uncomfortable, it is within these types of spaces that learners learn to think and learn to act (Allan, 2008); it is here that teacher identity can really take root. Immersed in a problem-based learning curriculum, learners cannot be passive. They must experience learning by being a participant in a process that begins with a challenge and continually develops new challenges, with no definitive end. The process might be unpredictable, at times, but it is predicated upon pressing questions that build learners’ divergent thinking (Allan, 2008; Duch et al., 2001), and it requires that the learners reflect throughout the process, raising their self-awareness and providing ample opportunities to examine their beliefs, values and judgments in light of new information they uncover.

Learners might not know if what they discover is what they are “supposed to” discover, but they will know how it fits with their previous experiences and growing knowledge base. Within problem-based learning, there is no room for mimicry, and control is released to the learner, the pre-service teacher, who manages his/her own ill-structured problem. A problem-based learning environment is one where “student teachers’ knowledge and understanding might be fashioned as a series of maps, ‘entirely oriented toward an experimentation in contact with the real.’ These maps do not replicate knowledge but perform and create new knowledge” (Allan, 2008, p. 121). With respect to multicultural social justice education, pre-service teachers directly confront problems and can explore independently what is possible and what kinds of alternatives do or could exist as they begin to think about how they might reconstruct schools and society. They become empowered and skilled at articulating their own goals for social justice as well as how they might approach their work toward the goal (Burch, 2001; Sleeter & Grant, 1994).

If the teacher/professor’s role would shift from being the source of information to being a coach and participant, prospective teachers could uncover what resonates with their personal experiences and be challenged to evaluate the current structures of and approaches to education. They could begin to determine how they will “fit” and how they might serve as multicultural educators. This type of learning can be “messy,” but Ferri (2006) reflects on the benefits of the unpredictability that exists within problem-based learning:

I believe that the places of conflict and friction represent some of the most troubling and productive times I have had in the college classroom...it is in these ‘stuck places’ – when we are challenged by ‘ruptures, failures, breaks, and refusals’ – that we find our most promising pedagogical moments...It is in these moments of resistance and disjuncture

that we find spaces to trouble our taken-for-granted ways of knowing, being, and acting.  
(pp. 303-304)

While teachers/professors may not know in advance what their students (or they) will discover during the problem-based learning process, it is clear that each individual's experience will differ, and each individual's experience will be unique. While engaged with problem-based learning, pre-service teachers will acquire more than just a collection of facts (Checkley, 1997, p. 110). They will be developing critical habits of mind – self-awareness, divergent thinking, and humanizing dispositions – necessary to effectively teach all students.

## Paper 2

### Problem-Based Learning, Divergent Thinking and Teacher Identity

#### **Introduction**

The process of learning about pedagogy, curriculum and what it means to “be” a teacher involves more than acquiring information or collecting facts. An important aspect of the development of pre-service teachers involves engaging them in opportunities to develop their divergent thinking. While convergent thinking follows a set of accepted steps to arrive at one solution, divergent thinking is free-flowing and generates many possible solutions. Divergent thinking is the ability to see many possible ways for interpreting a question and to see many possible answers to a question, not just one (Robinson, 2010, 2011). Fasko (2000), in his research on developing creativity and divergent thinking skills, asserts that experience with discovery learning forces the learner “to manipulate the environment and produce new ideas” (p. 320). With the development of divergent thinking comes the ability to consider information from multiple sources. Teachers who are able to think divergently can accomplish change through thinking about many possible approaches or solutions and anticipate potential pitfalls. Guilford (1972) contends that the transformation abilities (revising one’s experiences to produce new patterns of thought) that result from a learner’s engagement in divergent thinking are important because they increase students’ flexibility in thinking and lead to the production of more new ideas. In effect, divergent-thinking teachers are able to approach, think through and solve problems independently and with confidence (Pajak, 2000). These teachers also are able to recognize that their identities are perpetually under construction, as they confront their changing realities and multiple influences. They use this self-awareness to better understand education as a

profession, making decisions based on analysis and interpretation of information and inferences from a variety of sources and their own experiences (Bauman, 2006; Pajak, 2000).

With opportunities to examine current structures of and approaches to education, pre-service teachers have the potential to see the complexities of PreK-12 education and envision themselves in that context. With a stake in the struggle to define themselves as educators there is a greater potential for building their commitment to working to make change. Ferri (2006) contends that pre-service teachers need to be able to think critically about their own previous learning and development to begin to see what has influenced them and how their experiences might inform their questions about and goals for education.

Much depends upon the stage of pre-service teachers' development as well. Students in their first education course (as is the case with the following research study) cannot and should not be expected to have fully developed their professional dispositions. They may not yet be ready to define the role of a teacher or the various approaches to education. Instead, it would be more developmentally appropriate for them to begin to see the complexities of PreK-12 education, the many influences upon the field, and the varied expectations of teachers. They can be expected to work to understand potential barriers to teaching and learning; they can be expected to seek resources that provide insights into how some practicing teachers have overcome barriers to teaching and learning. They may not be able to speak articulately yet about educational theories, but they could be expected to gain insights into the effects of their previous experiences with education on the ways they think about what is possible in PreK-12 education. They may not be able to identify every professional disposition, but they can be expected to begin to build a sense of who they are as pre-service teachers and to think about who they might

be as practicing teachers. They might not have all of the answers, but they can be expected to learn how to ask pertinent questions.

A problem-based learning curriculum, especially when implemented early in education coursework, has the potential to create a space for pre-service teachers to build a sense of themselves as teachers, through practicing divergent thinking. What follows is my narrative research study, examining four pre-service teachers' divergent thinking around an ill-structured problem embedded in a problem-based learning curriculum.

### **Research Context**

The context for this research is a small, private college situated in a large urban/metropolitan city in the Midwestern United States. I call this institution "Ortler College." Ortler has roughly 2,000 students enrolled in its undergraduate programs and offers over 60 undergraduate areas of study, organized into four schools, School of Arts and Sciences, School of Business, School of Nursing, and School of Education. Class sizes average 20-25 students.

Ortler is an ability-based learning institution. Students college-wide do not receive letter grades as an evaluation of their performance. Instead, they receive narrative feedback in relation to explicit and transparent criteria for all performance-based assessments. Through their courses, they earn validations for the eight core "Abilities" offered college-wide, required for graduation. These Abilities are Communication, Analysis, Problem-Solving, Developing a Global Perspective, Effective Citizenship, Aesthetic Engagement, Social Interaction and Valuing. Each Ability has four undergraduate levels, and each course offers validation opportunities for different levels of different Abilities, depending upon the focus and work to be completed.

Students have the opportunity to pursue a major or a minor in Education, depending upon the license they wish to earn at the completion of the program. Early Childhood to Middle

Childhood (grades PreK-6) and Middle Childhood to Early Adolescence (grades 1-8) candidates pursue a major in education and a minor in a content area, such as Social Studies, English Language Arts, Science, Mathematics or Spanish. Candidates pursuing an Early Adolescence to Adolescence license (grades 6-12) major in a content area and minor in Education. Candidates seeking a K-12 Art Education license participate in an integrated program of Art and Education courses.

For my research, I used a section of the first required education course (“ED 100”) within the School of Education for all education majors and minors. This course was originally designed to fulfill certification requirements related to the state human relations code. It has a split focus; the first one-third of the course focuses on developing the abilities required in order for education candidates to pass the Pre-Professional Skills Test (PPST®), a state requirement for teacher certification. The remaining two-thirds of the course are devoted to exploring multicultural education and serving diverse students. As stated in the syllabus, the goals of this course, related to the latter focus, are to acquire the skills to work effectively in a variety of environments with people of diverse backgrounds; to identify the resources available within the community to assist in addressing the needs of diverse students; and to analyze individuals’ skills, values, and interests as they relate to multicultural education and serving diverse student populations. Students have the opportunity to earn a Level 1 Social Interaction validation through the successful completion of this course.

The stated outcomes for ED 100 are as follows. Students are expected to:

- Develop a *personal* awareness of self (values, personality, cultural background, interests, skills, etc.) as related to various *diverse communities* that are a part of society.

- Develop an emerging awareness of cultural identifiers and their influences on people's lives.
- Understand what diversity means and includes in a pluralistic society.
- Develop an *educational* awareness of self (values, personality, cultural background, interests, skills, etc.) as part of a *professional learning community*.
- Develop an emerging awareness of culture and its influence on student learning.
- See relationships to the “Ortler” Advanced Education Abilities (Communication, Coordination, Conceptualization, Integrative Interaction, and Diagnosis) and the State Teaching Standards.
- Develop an understanding of the nature of prejudice and discrimination, including racism, sexism, classism, homophobia, language- and immigration-based discrimination, and other forms of social bias.
- Recognize the psychological and sociological damage of prejudice to both minority and majority peoples.
- Become aware of the impact of biases on interpersonal relationships.
- Understand the multicultural factors that affect student learning and what it means to be a culturally competent educator.
- Increase their awareness of multicultural teaching strategies to use in the PreK-12 classroom.

In essence, students in ED 100 are expected to *acknowledge* some of the complexities of culture and of multicultural education and be *aware of* some of the factors influencing teaching and learning. They are expected to *begin* to understand themselves presently as well as to *start* to think about themselves as professionals within the complex environments of PreK-12 education.

I have taught this course for several semesters using guest speakers to highlight issues relating to multicultural education and serving diverse students; one textbook that focuses on one model of multicultural education, particularly how fostering esteem, empathy and equity is the basis of serving diverse students; whole class and small group discussions of the text and guest speakers; individual written reflections to process readings and guest speaker presentations; and a case study of a local urban dual language public elementary school. In past semesters of facilitating this course, I had found that, in students' end-of-semester reflections, many simply repeated the ideas they had read in the text or had heard from guest presenters. I became concerned that these pre-service teachers were not generating any unique perspectives about or internalizing any concepts related to multicultural education and were not developing any personal commitment to serving as multicultural educators in their future classrooms. I was convinced that they were only echoing what they had heard from others, from those they believed to be authorities.

Instead of a more traditional approach to this course, I wanted to create a space where students could create different pathways in exploring the course concepts, removing the emphasis on "the Truth" as represented by pre-selected textbooks and the professor's and guest speakers' presentations. I wanted to be more explicit about creating opportunities for pre-service teachers to explore their previous experiences with teaching and learning, the surrounding community, and the workings of local schools. As a result, for the purpose of my research, I implemented a problem-based learning curriculum, posed an "ill-structured problem" to the students, and allowed them the opportunity to "struggle" with "complicated real-world issues" (Checkley, 1997, p. 1) as they determined what sources of information would help them begin to answer the questions raised by the ill-structured problem.

## Methodology

### *Procedure*

To frame my research, I focused on the following questions:

- How does using a problem-based learning curriculum with pre-service teachers in their first education course create a space where they can examine some of the complex factors influencing teaching and learning?
- How does using a problem-based learning curriculum foster the type of independent and divergent thinking necessary for pre-service teachers to understand how they are currently situated (as learners shaped by years of personal experiences with education) and begin to build a sense of themselves as future teachers?

In order to study these questions, I implemented a problem-based learning curriculum in ED 100, the first education course for all Education majors and minors, and I engaged in a narrative inquiry of selected participants' weekly reflections.

At its core, problem-based learning relies upon the “ill-structured problem,” modeled after authentic problems students would likely face in the field, to motivate students to engage in free inquiry. The ill-structured problem scenario requires that students work collaboratively and engage in reanalysis of the problem and of the information gathered during the research process. The problem scenario is messy and incomplete, and students are responsible for asking questions, determining and seeking out resources, and discovering the complexities of “real world” problems. Teachers/professors take on the role of tutor, relinquishing the authoritative voice in the classroom, monitoring students' progress and assessing their work, but not providing information or a definitive route to take to construct a solution to the problem (Duch et al., 2001; Levin, 2001; Savery, 2006).

The ill-structured problem-scenario I provided to students was adapted from Lee Shumow's (2001) work with an introductory undergraduate course in Educational Psychology (Levin, 2001, p. 29):

*A local school has a 63 percent "minority" population (35% African American, 18% Hispanic, and 10% Hmong). Most (75%) of these minority students come from low-income families, whereas only 6% of the white students in the school come from low-income families. A majority (85%) of minority students is performing considerably below average academically, and the minority student suspension rate is five times the majority student suspension rate.*

*An advocacy group has begun picketing at the school and is seeking ways to eliminate state funding for the school in an effort to close it. It claims academic ability grouping is a form of segregation and that the low achievement scores are indicators of discrimination.*

*A coalition has also expressed concern. It has called upon its membership to support the school in its attempt to address inequities and raise achievement of minority children.*

*The school board has promised the community that they will solve this problem fairly. Their plan is to use the services of educational consultants to help them identify the source(s) behind the low academic achievement and high suspension rate and to work with the staff to help all children succeed.*

*You are one of the groups of consultants working on this "case." You were selected because of your commitment to improving learning among all students. On December 10, you will meet with the school's leadership team to present your analysis and suggestions.*

Students were arranged in groups of four. In creating the groups, I attempted to mix the licensure areas so that each group had at least one member pursuing an Early to Middle Childhood, a Middle Childhood to Early Adolescence, and an Early Adolescence to Adolescence or a K-12 Art license. Each team was labeled with a color – Blue, Yellow, Purple or Pink.

Students received the ill-structured problem statement after learning a bit about what problem-based learning is, including the role of students, the role of the professor, and the ways they would be assessed throughout the process. They had an opportunity to discuss their concerns and to clarify with me any confusion regarding this curriculum, as this was the first time any of the students in the class had experienced problem-based learning.

After receiving the ill-structured problem statement, students brainstormed questions within their collaborative teams, focusing on what they needed to learn in order to make progress toward identifying the causes behind the problem and making suggestions to the leadership team to improve the situation. These questions were shared with the collective whole before more team-based question formation continued.

Coming into the second class session, students were asked to continue generating questions for consideration as well as to generate ideas for resources they might use to begin finding information or answers to their initial questions. In the second class session, individuals shared their questions and ideas for resources with their teams and then shared with the collective whole.

Each week, teams needed to meet together to complete a goal setting sheet. Guided by prompts, teams set a group goal and determined what individual steps would be taken toward the group goal. Teams crafted a rationale to support why they set both the group goal and the individual steps to be taken toward the goal. Throughout the semester, teams created a total of seven goal setting sheets.

Also on a weekly basis, students individually reflected on the group goal, individual progress made toward the group goal, and new questions to explore as they reflected on what they learned and what they still wanted or needed to learn. For the weekly reflection sheets, each individual responded to three questions, designed to support reflection on the work that was done and to generate thinking about the next steps. Again, they completed a total of seven weekly reflection sheets.

Students also wrote bi-weekly reflection papers (a total of four) responding to a prompt I provided them, in which they drew on their experiences and any research they might have done

for this class, other classes, or personal/professional development outside of the academic context.

For class meeting sessions, groups worked together on exploring resources, generating questions, conducting observations in the field, conducting interviews, discussing individual progress and/or discussing weekly goals. While students were not required to report to the classroom every week (they could use the time to conduct field observations or interviews, for example), most chose to use the class time to collaborate with their group. They often conducted their observations, interviews, etc. on their own time between class sessions.

During final assessment week, groups presented their analysis and suggestions to a group of professors from the College, role playing as the school board for the school described in the ill-structured problem. As a problem-based learning curriculum does not define the product students must generate, groups were able to decide how they would share their information. One group created and navigated a website during the presentation, another group created a school handbook, and the remaining two groups created Prezis to guide their presentation. After sharing their analysis and suggestions, board members and classmates posed questions to the presenters.

### *Participants*

ED 100 had a total enrollment of 16 students. After students completed the course and final progress codes were submitted, all of the enrolled students received information about my research study. At that time, I asked for volunteer participants in my narrative inquiry. Consenting to participation included giving me permission to use the weekly goal setting sheets, weekly reflection sheets, bi-weekly response papers, notes I took about the group discussions, and materials from the final presentations. It also gave me permission to interview them. Twelve of the 16 students in the course, representing the four different collaborative teams, consented to

participate in the narrative inquiry. Four students were from the blue team, four students were from the yellow team, two students were from the pink team, and two students were from the purple team.

From those students who consented to participate, I identified those who had all or nearly all of their weekly reflection sheets submitted from throughout the semester, to be able to access the most complete picture of their thinking. That left me with nine eligible students. In choosing the *focus* participants from the nine eligible students, I set out to select one individual from each team, and to represent a range of licensure areas. Ultimately, I chose two participants who were Early to Middle Childhood candidates (from the blue team and the pink team), one participant who was a Middle Childhood to Early Adolescence candidate (from the purple team), and one participant who was an Art Education major certifying for grades K-12 (from the yellow team).

### ***Data Generation and Collection***

For those participants who consented to use of their coursework in my research, I engaged in document analysis of the problem-based learning curriculum materials implemented as well as the collection of documents. The purpose of document analysis was to explore the types and trajectories of questions the students researched throughout the semester as well as the sources of information students accessed. I also used document analysis to note patterns of change in individuals as they reflected on the contexts of PreK-12 education and their role as teachers. I took note of similarities in progression between individuals.

While I conducted interviews with many of the consenting research participants, I chose not to include the interviews as a data source in this paper because the participants were much more eloquent in their writing throughout the problem-based learning process than they were during the retrospective interviews. For example, during an interview with one participant, I

asked how she would hold high expectations for all of her students. She responded, “I really want students to help each other, and I want to motivate and push students like she [her high school art teacher] did.” However, in her written reflections, this same participant reflected on how she would hold her students accountable by writing,

I learned several different techniques that should all be integrated into teaching styles...The one I liked the most is the ‘No Opt Out’ technique. This technique does not allow students to opt out of questions. No answer can be ‘I don’t know.’ If the student does not know the answer, another student is asked the same question. Whenever the answer is said, the teacher asks the first student again so they [*sic*] can repeat the correct answer.

Similarly, another participant gave a much more nuanced explanation in her written work of how to foster relationships with and between students. She wrote,

Students need to be made aware of the different cultures around them. Teachers should have students talk about their culture in their homes and maybe bring in a special item...from that culture so the class gets a taste of the different cultures out there. Doing this not only helps the students learn but it also helps the teacher learn about the different cultures in his or her class. This can help teachers prepare lessons that meet the needs of all of the students in the class. I can see the different cultures at the school [where] I do my field visit at [*sic*] just by sitting and observing the students.

During the interview, this participant simply stated, “it’s important to connect with students and have relationships with them.” Consistently embedded within their written narratives from throughout the semester were more detailed insights into how the participants were making sense

of their research with respect to their evolving view of their role as future multicultural educators.

### *Narrative Inquiry*

Narrative inquiry afforded me the opportunity to gather participants' reflections as data in order "...to produce an accurate description of the interpretive narrative accounts individuals or groups use to make sequences of events in their lives or organizations meaningful" (Clandinin & Connelly, 2000, p. 16), in this case, the sequences of events that unfolded during pre-service teachers' engagement in a problem-based learning scenario. Chase (2010) speaks to the overall experience of the narrative inquiry and narrative inquirer:

...Narrative researchers treat narrative – whether oral or written – as a distinct form of discourse. Narrative is retrospective meaning making – the shaping or ordering of past experience. Narrative is a way of understanding one's own and others' actions, of organizing events and objects into a meaningful whole, and of connecting and seeing the consequences of actions and events over time. (p. 214)

My research focuses on how the participants made sense of the ill-structured problem presented to them, specifically their patterns of thinking in analyzing the problem and determining solutions to the problem. It also looks at pre-service teachers' growing awareness of the various influences on teaching and learning, the complexities of PreK-12 education. Finally, my research examines how pre-service teachers begin to build a sense of themselves as teachers. Since "consciousness and identities are not matters that lend themselves to precise measurement" (Perry, 2002, p. 199), narrative inquiry afforded me the opportunity to study the unique individuals rather than be forced to draw sweeping conclusions. It allowed me to make sense of

what happened with a four selected participants at one particular post-secondary institution, in one particular teacher preparation course.

### ***Data Interpretation and Analysis***

For data interpretation and analysis, I engaged in inductive and deductive methods of analysis (Graue & Walsh, 1998). After preliminary readings during which no coding took place, I read through the data numerous times, identifying patterns between the participants' responses. Examples of patterns were use of personal experiences as a source of information, use of unconventional versus conventional sources of information, use of theory and counter narratives, types of questions, trajectory of question formation, follow through between questions and completed research, reflections on influences on teaching and learning, and connections between research and the core issues of the ill-structured problem. Once I coded these patterns, I read through the data again to verify themes and pursue threads that would provide a coherent way of thinking about the research (p. 163). I identified three themes under which the patterns could be grouped – sources of information, questions, and reflections/connections.

I also read the data, patterns, and themes against my personal and professional knowledge, particularly knowledge of ED 100, as I had previously taught the course using a different curriculum and approach to learning. I also read the data against professional literature on problem-based learning (Barrows & Tamblyn, 1980; Duch, Groh, & Allen, 2001; Edwards & Hammer, 2004; Levin, 2001; Murray-Harvey & Slee, 2000; Savery, 2006) and against literature on the development of pre-service teachers' dispositions and professional identity (Diez & Murrell, Jr., 2010; Fallona & Canniff, 2010; Feiman-Nemser & Schussler, 2010; Hollon, Kolis, McIntyre, Stephens, & Battalio, 2010; Laine, Bauer, Johnson, Kroeger, Troup, & Meyer, 2010). This literature, taken together, examines the challenges to developing pre-service teachers'

professional dispositions and awareness of their identity as teachers and how problem-based learning as a curricular approach can offer spaces for their developing their awareness.

### **Positionality and Reflexivity**

My role as the instructor for the course carried some potential implications. Both with implementing a traditional curriculum and a problem-based learning curriculum, the students in ED 100 understood the course outcomes, as stated in the syllabus and reviewed throughout the semester. Two of the course outcomes, in particular, aligned with factors I sought to examine as part of this research study:

- Students are expected to develop an educational awareness of self (values, personality, cultural background, interests, skills, etc.) as part of a professional learning community. Students will develop an emerging awareness of culture and its influence on student learning.
- Students are expected to develop an understanding of the multicultural factors that affect student learning and what it means to be a culturally competent educator. Students will also increase their awareness of multicultural teaching strategies to use in the classroom.

Since the students in this class understood that they needed to demonstrate ongoing growth toward these outcomes in order to be successful in the course, I expected that they would make a conscious effort to tailor their communications with me as part of the course, and therefore as part of the research study, in order to provide evidence of their ongoing growth toward the course outcomes. Therefore, I expected pre-service teachers to be consciously demonstrating evidence of the course outcomes during class discussions (which I facilitated and assessed as part of my role as instructor and observed as part of my role as researcher), written reflections (on

which I provided written feedback as part of my role as instructor and collected for document analysis as part of my role as researcher), and interviews (which I conducted as part of my role as researcher). Regardless of the type of curriculum, I struggled to know for certain what knowledge and understandings the students had internalized and what they were giving for the purpose of satisfying course outcomes. The difference I anticipated, however, between the students' oral and written responses within a problem-based learning curriculum was that, due to the wider array of sources of information, pre-service teachers might not have felt pressured to repeat paraphrased information from the single textbook and limited number of guest speakers built into the traditional curriculum. Having fewer sources upon which students could draw information (as in a traditional curriculum) might have communicated a message of accepted or preferred sources; the benefit of a problem-based learning curriculum, then, was that the students selected their own sources of information. While students were expected to demonstrate course outcomes, the route to demonstrating them was more varied, allowing me access to students' growth, which was important for me, both as their instructor and as a researcher.

Even with the flexibility of pathways to exploring the ill-structured problem, there still existed the danger of pre-service teachers simply reciting what they uncovered during their explorations (a group of teachers at one school or information from one book, for example). The issue around mimicry is that pre-service teachers accept what they hear or read without much analysis or evaluation of it. While it might not have been from my presentations or materials, the pre-service teacher could ultimately end up repeating what they found in her own resources. I was conscious of this tension and used opportunities in class to encourage students to widen the scope of resources and information and explore counter narratives as a way to discourage tunnel thinking and parroting of a *Truth* as opposed to the exploration of *truths*.

Lastly, I recognized going into the research that I wanted the problem-based learning curriculum to be more effective in ED 100 than my previous approaches to the course. As a result, I was aware that this bias might have impacted how I viewed the data as well as how I implemented the problem-based learning curriculum. I questioned if I taught the problem-based learning curriculum with more attention to detail or more enthusiastically, were the changes due to the manner of my implementation or were they changes brought on by a different curriculum? While I kept this question in mind as I reviewed the data, looked for patterns and drew conclusions, my intent was not to study my own teaching. However, in this type of research, there is no way to not think about myself as constantly present when the research is happening in my own classroom. I reflected upon these biases and recognized their impact. I stayed focused on the stories that emerged from the participants.

*This study is not a defense of the problem-based learning curriculum over other approaches to curriculum.* This is a study to explore the ways four pre-service teachers talk about education and their role in it, after completing their first Education course, in which a problem-based learning curriculum was implemented.

### **Participant Reflections**

#### **“Lilly”**

“Lilly” (pseudonym), a member of the Blue Team, was a sophomore-status, Early to Middle Childhood Education major, pursuing a minor in English-Language Arts. She is a white, heterosexual, middle class, native English speaker from a local suburb near the College. In the semester she took ED 100, she served on the leadership board for the student education association on campus. Previously a Business and Management major, Lilly switched her program to Education in the semester she began ED 100.

Lilly's first step in the process of making sense of the ill-structured problem was to observe at the daycare facility where she works, taking note of the environment, interactions between children, and classroom materials. Overall, her reflections on what she has learned at this point were sparse and a bit surface level, "I didn't notice any discrimination at this young age, but I did notice that there were less [sic] minorities." However, she did make some important observations; she identified that there was a lack of diversity represented in the books the children use, the children were of different ethnicities, and mothers and grandmothers were almost always the caregivers to pick up the children at the end of the day. Coming away from these first observations, she began to wonder about other classroom environments, particularly those of local elementary schools. In addition, while she did not provide evidence that the reason only mothers and grandmothers pick up the children is because of the absence of a male figure in the family, not seeing the males in that space made her think about single parent families. She did not state that she thought the children predominantly came from single-parent families, but she became interested in the topic of the effects of single parent families on student academic achievement nonetheless.

Lilly's questions at the end of the first week's reflection identified a desire to look into the local elementary schools and to find information about the effects of single parent households on children's behaviors later in life. The work she went on to complete, however, strayed from those questions and instead focused on who drops out of school and the reasons given for the drop out rates. She used websites (not cited) to find her information. Based on the information about students who drop out, she returned to questions related to family/parent influence on children, specifically family values and the connection to pregnancy, drug use, and communicating the importance of academic achievement. Additionally, she identified a pattern

between missing school and the likelihood of dropping out. She ended her reflection with a question about the role of school boards in student suspensions. Her focus during this stage of her explorations of student drop outs was on the role of families, not the roles and impact of schools.

In week three, Lilly spent time interviewing her boyfriend's cousin, a teenage mother, drawing on her own experiences to find resources, in this case a more unconventional source of information. At this point in the research process, it appeared Lilly and her group members were straying too far from the ill-structured problem, in that the ill-structured problem did not mention an emphasis on females and did not make reference to teen pregnancy. It also was not limited to middle or high school (teenagers). Toward the end of her reflection on what she learned, however, she stated, "I think this leads our group onto something larger... if students have high confidence rates and feel that they are getting helped and are doing well, maybe they will have more motivation in school!" The bulk of her questions coming out of week three were related to motivation, which broadened the focus more than the limited view on teen mothers. At this stage of her explorations, she was looking at an individual's motivation to go to school, without explicitly addressing the role of the teacher and the school in developing students' motivation to come to school and learn. Unrelated, she ended her reflection with a question about the media as a potential influence on children, teaching and learning.

In week four, Lilly wrote about finding information about Vygotsky, her first mention of an educational theorist. It was also the first week that she mentioned referencing a database for information, as opposed to using a search engine to access articles or information. In contrast to these more academically-supported sources, she talked about creating a poll on a social media site, which spoke to a balance of resources, some with which she was familiar and some with

which she might not have been. Her questions at this point were more scattered than in previous weeks. She wondered about Vygotsky's influence on the classroom and what professionals think about his theory. She wondered what makes a good teacher (despite reflecting on different sources over the past week that identified characteristics). She turned her attention to motivating teachers as well as fostering respect for them. She also wondered about the possibility (or impossibility) of generating more parental involvement. While she said she thought that the group was getting closer to some solutions to the ill-structured the problem, her reflections and questions indicated that she was deep in the "messiness" of the problem, with no one clear direction for focusing on a solution. Regardless, she said she "really enjoyed researching this week."

By week five, Lilly began to unify various themes she had mentioned in previous weeks. She began by talking about the course textbook (which was made available in the bookstore but was not listed as a required text) and chapter she read, focusing on the impact of socioeconomic factors on learning. From there, she was able to talk about the various influences and support systems that she had previously mentioned – parents and teachers – but also new influences and supports – literacy programs and programs such as Head Start, recreational activities, peers, and the greater community. She referenced the No Child Left Behind legislation, the first reference to governmental influences on schools. Lilly provided a more holistic overview of the problem and the embedded complexities, both of causes of the problem and ways to combat the problem. Her questions turned to how these "big ideas" could become workable solutions for the ill-structured problem at hand.

Following up from an element from the previous reflection, Lilly focused her efforts in week six on after-school programs, their characteristics and benefits. Her closing questions made

reference to the need to bring all of the information together in a way that would make sense for the audience during the upcoming presentations. She did not pose any new questions to explore at this stage, which was likely more a result of needing to wrap up before the due date than not having any other questions to consider.

In her final reflection, Lilly was in review mode as she prepared for the final presentation. Her questions focused entirely on organizational concerns for the presentation, again, likely due to time running out in semester, as opposed to not having any additional questions to consider. As part of her reflection, she included a chart, organizing her research from the semester. Interestingly, despite having a column for “analysis of the problem” and a column for “suggestions for solving the problem,” nearly all of her information, regardless of the column, could be categorized as analysis of the problem. She wrote early on that the problems need reasonable solutions, but, at this point, solutions were not made explicit.

### “Sage”

“Sage” (pseudonym), a member of the Yellow Team, was a sophomore-status, Art Education major. She was the only participant whose licensure would allow her to teach grades K-12, after certification. Sage came to Ortler as a transfer student. She is a white, middle class, heterosexual, native English speaker from a nearby urban city near the College. While seeming more reserved during the group interactions, her quiet nature might have been more of a result of working in a group with another classmate who was quiet assertive and emerged as the unofficial leader. In conversations with Sage one-on-one, it was clear that she was thoughtful and enthusiastic about teaching and learning.

Sage decided to start her search for information with an observation at her previous high school, in art education; she began with her experiences with education that came most readily to

mind. Sage wrote about noticing differences in the students she observed and she mentioned the percentage of students on free and reduced lunch, but she did not take the observation any further than to say she noticed differences or received the information.

During this time, Sage and one of her group members also attended a community conference, “The Art of Happiness,” hosted by Ortler. Representatives from Ortler’s School of Education facilitated a session entitled “Happiness in K-12 Schools: The Joy Factor;” Sage and one of her team members attended this session during the conference. At the end of her reflection, she wondered if she should “...start focusing on the ‘Joy Factor’ in classrooms while working with equality issues still. I believe grades would improve by making sure the students enjoy what they are doing in the classroom.” These musings touched on issues related to motivating students, developing equality, and raising academic achievement. At this point, however, it was not clear if she saw a connection between all three of these issues.

There was some confusion around Sage’s second weekly reflection. At first, she did not mention that she met with the teacher with whom she was attempting to schedule an observation. Later, however, as part of her discussion questions she wanted to pursue, she mentioned that she spoke with this teacher about her strategies for overcoming language barriers. Sage neglected to discuss what she had learned from her discussion with the teacher. There was no also follow-up to the Joy Factor she referenced at the end of the first week. She had again chosen observation as her source of information at this point, and she was again focusing on art education, although this time in an elementary setting.

In week three, Sage came back to referencing the Joy Factor, but she did not define what was meant by the Joy Factor, except in later comments about students enjoying themselves and understanding ways to engage students. She did not list any specific techniques, despite stating

that she saw some. There was no discussion linking the Joy Factor to the two largest issues presented in the ill-structured problem statement, low academic achievement and high suspension rates for segments of the student population. She again used observation as her primary means of acquiring information, and she identified that she wanted to see more classrooms as part of her evidence gathering. She did mention diving deeper into the Joy Factor, which could have included exploring other sources of information, although she had not explicitly identified such sources.

Despite noting at the end of the previous week's reflection that she wanted to observe in more schools, in her next weekly reflection, she identified reading a book (*Reflective Practice to Improve Schools: An Action Guide for Educators*) to advance her understanding of the Joy Factor instead. This was the first mention of her using a source beyond observation and interviews. It was also the first mention of influences outside of the classroom that might impact teaching and student learning when she stated, "So even though we are focusing on bringing the joy factor into the classroom, we need to realize that there are outside factors that can play into what we can or cannot do in a classroom, and that daily plans can be disrupted." She mentioned at the end of her reflection that she wanted to seek out counter narratives to the ones she had been reading, and she also noted that she wanted to pair her observations with published information.

Sage's explorations came to a halt, early in the process, with just over three weeks to go before the final presentation. She had previously set goals to explore some of the different influences on teaching and learning that had begun emerging for her; however, she did not include in her reflections any progress toward those new explorations. Instead, she reviewed

what she had found up to this point and was now focused on looking at the ways she could work with her group to present the information.

For her week six reflection, Sage began by noting she had been reading a book (*Teach like a Champion*) that had only been mentioned for the first time this week. It was not clear from the reflections if she had finished reading the book she identified earlier in the process, and it was not clear from previous reflections when she began reading this new book. She focused on one technique from the book, but there was no connection between the technique and the Joy Factor theme that ran throughout her reflections. There were also no connections between the technique and the ill-structured problem, namely how the technique might have addressed the low academic achievement and high suspension rates identified at the core of the ill-structured problem. The external influences referenced in an early reflection were not mentioned again. She did point out at the end of the reflection the need to explore how the Joy Factor could address the issues in the ill-structured problem, but the goals for pursuing this avenue remained vague.

In her final reflection, Sage was able to make connections between her last reading and what she observed primarily at the elementary school earlier in the process. However, she did not engage in any discussion of the various influences on teaching and learning, and she did not explicitly make reference to how the Joy Factor or the techniques she had described helped her make sense of the ill-structured problem (issues of low academic achievement or high suspension rates) or how they could be viable suggestions to make to the board in an effort to effect positive change.

### **“Heather”**

“Heather” (pseudonym), a member of the Purple Team, was a sophomore-status, Middle Childhood / Early Adolescence Education major, pursuing a minor in Science for Teachers. The

Purple Team was one of the most tumultuous teams in the class. It started as a team with four members, but a few weeks before the final presentations, the Purple Team was down to only two members. One team member dropped the course, citing personal reasons, and another team member became “ineligible to continue,” as per syllabus policy, after she accumulated too many missing assignments and class absences. Heather is a heterosexual, Hispanic, native English speaker from the large, urban city of which Ortler is a part. She is a single mother to a toddler, and she also has demands on her time having to care for her aging parents. She has had difficulty remaining in good academic standing with the College, likely due to the other commitments on her time. In the months before starting ED 100, Heather changed her major from Art Education / Art Therapy to Elementary / Middle School Education.

Heather quickly immersed herself in print resources as she began to make sense of the ill-structured problem. She began by locating publications, both articles and books, as well as researching the local public school district and a local daycare center. She prepared for interviews of professionals in the field. With her first reflection, Heather already identified numerous influences on teaching and learning, both with her comments on what she had learned and through her questions at the end of the reflection. At this point, she identified teachers, students, parents, socio-economic status, government (funding, testing, and programming), language barriers, and ethnicity as factors to consider as she worked to analyze the problem and determine viable solutions.

In week two, Heather continued to explore how the various influences on education she had previously mentioned (teachers, students, parents, socio-economic status, government, language, and ethnicity) related to and influenced one another. She noted that she had begun looking at themes from the responses she received from her survey. Referencing socio-economic

status multiple times, she talked about issues of equity (as opposed to equality) and devised questions that would expose the limitations on schools, teachers, and the teaching/learning process resulting from funding, programming availability, parental involvement and class size. Heather identified that she wanted to talk with the professionals who participated in her survey in order to begin to answer the questions she laid out at the end of the reflection. There was no mention of how her articles and books from the first week were being used.

Then, due to a series of illnesses and family emergencies, Heather was unable to complete her third weekly reflection sheet or make significant progress between week two and week three. When she returned to the reflection process in week four, the depth of reflection lagged a bit in comparison to her first two weekly reflections. In previous weeks, Heather had asked critical questions for consideration, but in subsequent weeks, there was no follow-up to any earlier progress being made toward answering the questions or attempt to seek new resources that might provide relevant information. She closed the week four reflection by identifying that she would do more in-depth research, specifically focused on environment and roles in education. While these questions were not necessarily new for her, they were important questions to consider in relation to the ill-structured problem, and they consistently explored the various influences on teaching and learning.

In lieu of the reflection sheet, Heather provided a narrative in week five that began to build strong connections between the roles of government in education, particularly in the ways government policies and procedures have mandated how standardized testing and the results of standardized testing are used. She also submitted an organizational chart, but it lacked the same kind of unity that the narrative provided. In it, she mentioned resources for exploring the role of government, which would have connected with her narrative, but she also provided resources for

looking at school suspensions as well as classroom strategies for engaging students. She was drawing on a wider range of resources at this point when compared to week four.

Then, in week six, Heather's reflections turned to focus on her research of children's emotional development and strategies parents and teachers could use in fostering this development. The information was presented clearly, but the connection back to how this information helped Heather make sense of the ill-structured problem (specifically, the issues of low academic achievement and high suspension rates for certain segments of the student population) was left implied. In her final sentences she said that she would continue to find resources that related to academic achievement; perhaps her exploration here was to help her better understand why students are not succeeding academically, from an emotional development standpoint. Additionally, this information did not seem to directly connect back to the work she had done in previous weeks, specifically with respect to socio-economic status and the role of the government.

In her final reflection, Heather turned her attention to the final presentation. She had reviewed her research up to this point in the process and had discussed information with her partner. However, there was no mention of specific information or insights she had learned from discussions with her partner, despite the fact that her partner could have very well been another new source of information.

### **“Jasmine”**

“Jasmine” (pseudonym), a member of the Pink Team, was a sophomore-status, Early Childhood/Middle Childhood Education major, pursuing a minor in Spanish Language and Cultures. Mid-way through the problem-based learning process, the pink team lost two members when both dropped the course for undisclosed reasons. Before the team dropped down to only

two participants, there were not any obvious signs of trouble within the group, and the two remaining group members worked well together. She is a white, middle class, heterosexual, native English speaker from the large, urban city of which Ortler is a part. At the time of this study, Jasmine was a member of the leadership board for the student education organization on campus. She also brings with her a number of years of experience coordinating and facilitating after-school and summer programming for urban youth at a local YMCA.

Jasmine's first week of work focused on behavior management, attendance and policies for truancy. She selected an interview with a local middle school teacher for the largest surrounding public school system as her source of information to begin making sense of the ill-structured problem. The school happened to be her field placement for another Education course she was taking concurrently. While Jasmine might have been exploring attendance and truancy as a way of looking at the issue of low academic achievement and high suspension rates, a hypothesis about a connection was not explicitly stated at this point. She closed her reflection by stating, "I am still struggling with brainstorming more basic questions for our prompt."

Jasmine reported in her week two reflection that she conducted an observation but did not share what she discovered during her observation. She also noted that she interviewed the teacher, using the questions she outlined in the first reflection. She reported feeling "stuck," likely due to the fact that she had not generated a wide range of questions to start, and the questions she did have were easily answered by her one source of information. After receiving a suggestion from her partner, she turned her attention to the topic of "Beating the Odds" schools, which opened up the investigation a bit more. She mentioned researching criteria for "Beating the Odds" schools already, but she did not share what resources she was using.

In week three, Jasmine had begun noting the various influences on teaching and learning. Her focus for the week was to look at the ways staff can help students succeed. She continued to note information about behavior management, but after attending a forum about parental involvement in education, held at the College, she stated that she had a better understanding of the role parents play in helping with achievement. In addition to using the forum as a source of information, she identified exploration of her own management and reward systems that she used at her job at the local YMCA. There was no mention of what she learned from last week's exploration of "Beating the Odds" schools, although she referred to it as a continuing thread for the group still at this point.

Jasmine did not submit a weekly reflection sheet in week four. Then, in week five, when she next submitted a reflection sheet, she introduced a new resource, a book (*Teach like Your Hair's on Fire*), and she mentioned that she wanted to find more "educational documents" as she searched for strategies that were effective. There was no mention of connections to "Beating the Odds" schools in this reflection. However, she did state that she planned to find counter narratives to what she and her partner had found so far to balance her inquiry. Her earlier discussion of influences beyond the teacher (and the teaching strategies) was missing from this reflection. There were also no specific references to how the information about teaching strategies would help her make sense of the ill-structured problem.

In week six, Jasmine stated that making a school a "Beating the Odds" school could positively impact patterns of low academic achievement and high suspension rates; however, in this and in previous reflections, she did not provide much information about what goes into making a school a "Beating the Odds" school. It was difficult to tell if she understood the various influences at this point. She raised questions in week six that might have been more effective to

start the inquiry back in week one: “Why don’t certain behavior management techniques work in certain classrooms? What are the requirements for a school to become a “Beating the Odds” school? [What criteria would a school need to meet in order to be classified by the State as a “Beating the Odds” school?] Why are these students in low academic standing or have high suspension rates?” There was no mention of new resources located or used or resources she might have used to explore the questions she identified at the end of the reflection.

In her final reflection, Jasmine remained focused on the classroom, particularly the influences of teachers, and did not revisit the issue of parental involvement or introduce any other influences on academic achievement and/or suspension rates. She and her partner were working to pull together their resources in preparation for the final presentation. Jasmine shared that she had been feeling confused throughout the process; new questions and information emerged throughout the process, making her re-think her ideas: “Just when I think I am starting to feel good or understand, something happens or I find something else out which proposes new questions and makes me rethink a lot of what we have already.”

### **Discussion**

When examining the narratives of the four participants, there was evidence of divergent thinking in at least three categories – in the sources of information the pre-service teachers accessed, in the questions they posed and pursued, and in their connections and reflections. In this discussion, I will address how the structure of problem-based learning fostered the divergent thinking evidenced in the participants’ reflection before addressing the connection between problem-based learning, divergent thinking and teacher identity in the conclusion.

## Sources of Information

Lilly, Sage and Jasmine chose to conduct field observations as their first source of information, and all three women were personally connected to the sites they accessed. Lilly conducted a field observation at the day care center where she works, Sage returned to her high school to observe her previous art teacher's classroom, and Jasmine conducted a field observation and teacher interview at the school where she was completing a field requirement for another Education course. While Heather relied mostly on published research for her first source of information, she did create a list of survey questions that she passed out to teachers working at a day care center where she sends her daughter. These women began by acknowledging their existing connections to education and drawing on their personal experiences as valid sources of information.

All four of the participants drew upon their personal experiences and/or personal contacts at least one other time throughout the problem-based learning process. Lilly chose to interview her boyfriend's cousin as a source of information about challenges facing teenage mothers, Sage conducted a second observation at a local parochial school (referred to her by a classmate), Heather conducted observations at her daughter's day care center, and Jasmine examined her materials from her five years working with the before/after school and Day Camp programs at a local YMCA.

Three of the participants also accessed non-conventional sources of information. In addition to interviewing her boyfriend's cousin, Lilly also referred to an article by Dr. Phil, and she conducted a poll about effective teachers on the social media site Facebook. Heather created a survey to hand out to professionals at her daughter's day care center and to local PreK-12 public school teachers. Jasmine attended a professional forum held at "Ortler" focused on

parental involvement and schools. The pre-service teachers sought and made use of more nonconventional sources of information, beyond website and database searches, field observations and interviews, and textbooks, dissolving the boundaries around who or what is an authoritative source. The sources of information they accessed provided them useful information related to the focus questions(s) for the week and allowed them to broaden their perspectives on the ill-structured problem.

A potential detriment resulting from the pre-service teachers making their own choices about what sources of information to use is the fact that only one participant, Lilly, made any explicit links to educational theory when she referenced Vygotsky. Lilly also read a chapter out of the textbook listed as optional for ED 100. Sage chose to read (at least parts of) *Teach like a Champion* and a text on reflective practice. Heather explored documents on educational policy and researched documents from the state Department of Public Instruction. Jasmine selected *Teach like Your Hair's on Fire*. From their choices, the participants selected recognizable texts but did not dig (much) into educational theory. These participants were certainly not relying on theorists as experts or authority sources, but they also, as a whole, did not seem to acknowledge the importance of balancing their research with an exploration of what exists in educational theory. During my time with each of the small groups each week, I posed questions to students to help them think about what resources would provide accurate and relevant information. For all of the groups, I had suggested on numerous occasions that they seek out at least one vetted educational theory/theorist. We had conversations about how to find theory, since I was not going to tell them exactly who to research. Each of the groups were on the right path when they discussed talking with members of the School of Education, asking the library liaison to the School of Education, and conducting a Google Scholar search in order to find an educational

theory/theorist to study. However, as I showed with these four participants, only one candidate followed through with locating the information and incorporating it into the overall research process. While a goal in pre-service teacher preparation is to reduce the recitations of lectures, presentations, and textbooks, the discourses that live in educational theories should not be entirely avoided. There was a gap in Sage's, Heather's and Jasmine's research as a result.

All of the students were also encouraged to pursue counter narratives as they found sources of information that began to align with their ideas and beliefs. However, only Sage, in week four, and Jasmine, in week five, made explicit mention of wanting or needing to seek out counter narratives to their own or their team members' research. Like leaving the terrain of educational theory untraveled, finding only sources of information that "fit" with a particular ideology could be limiting to the pre-service teachers' development as well.

Overall, with the development of divergent thinking comes the ability to consider information from multiple sources (Robinson, 2010, 2011). Looking at what types of resources these four participants accessed provided evidence of how a problem-based learning structure created the space and flexibility for students to consider information from multiple sources. If divergent-thinking teachers are able to approach, think through and solve problems independently (Pajak, 2000), at least with respect to determining and accessing useful sources of information, these four participants demonstrated that they found the space within the problem-based learning curriculum to do just that. However, there were also many important resources and sources of information that went unexplored. As I talk about in the conclusion to this paper, there are ways the facilitator of the problem-based learning process can better invite participants into a literature base without controlling exactly what they access.

## **Types and Trajectories of Questions**

True to the structure of problem-based learning, the pre-service teachers in ED 100 were given the ill-structured problem scenario and had to determine what steps they wanted to take to find the information that would help them analyze the situation and provide suggestions to the board. Sage and Jasmine began their explorations by looking at behavior management techniques. Lilly conducted an observation, focusing on visible elements of diversity, and Heather began with some research about the structures governing educational systems as a whole and the relationship to socioeconomic status. The questions these participants posed after their initial observations affected their next steps and observations, and so on until the end of the semester.

Lilly's first questions focused on environments in elementary schools, diversity, and the relationship between children's risky behaviors and single parent families. In this early stage, she recognized multiple influences on teaching and learning, exploring at least three factors as she tried to make sense of the low academic achievement and high suspension rate of the students represented in the ill-structured problem. Similarly (and, to some extent, to a greater degree), Heather's initial questions reflected her awareness of the multidimensional nature of teaching and learning. She asked questions about environment, the role of teachers and parents, government funding, standardized testing, programming to serve diverse students' needs, socioeconomic status, and the issue of equity.

In contrast, Sage's focus stayed in the classroom. Her initial questions following her observations at her previous high school targeted students and teachers, the concept of the Joy Factor, and a connection between academic achievement and students enjoying what they are

doing. Jasmine's initial focus was on behavior management, and she struggled to think of questions to pursue; in fact, she did not respond to the final reflection prompt.

The initial questions impacted the overall trajectory of questions throughout the problem-based learning process, including when questions might have led certain groups too far from the ill-structured problem, when questions peaked in terms of yielding the most information, and when new questions to serve forward-moving thinking about the problem stopped.

While the focus topic shifted for Lilly, each week she posed questions that illustrated her thinking about the different factors influencing teaching and learning – parents, school board members, classroom atmosphere, after school activities, media, teachers, and money. Early in the process, Lilly appeared to stray too far from the ill-structured problem, as her questions and explorations began to focus exclusively on issues such as drug use and teen pregnancy. However, her questions at the end of week three around issues of confidence, support, and student engagement brought her back from too narrow a focus. While her questions at the end of week four were the most scattered / less unified of all of her weekly reflections, it was also in week four that the intensity of her questions peaked. She asked questions related to Vygotsky's theories, criteria to measure a "good teacher," ways to increase parental involvement, ways to develop respect for teachers, and ways to encourage teachers in low income areas to remain positive. Questions in week five shifted from trying to figure out why the problems are occurring to how solutions could be implemented. Finally, new questions for information-gathering about the ill-structured problem stopped in week six; her questions centered on unifying all of the information she gathered, and her questions in week seven focused on preparing for the presentation.

Of the four participants, Heather's questions had the widest scope. In week two, she was already posing questions about what equity looks like and how to establish equity in the classroom. She asked questions to explore the relationship between academic achievement and the arts, after school activities, class size, and parental involvement. She asked questions to explore the relationship between equity and government restrictions, teacher accountability, budget cuts, and serving families of low socioeconomic status. At the end of week two, it appeared that Heather's questions had peaked, and in many ways they had. Heather struggled in the middle of the process with completing her weekly reflection sheets, missing one entirely and submitting a narrative reflection and organizational chart for another week. These interruptions to the routine made it more difficult to track her thinking with regard to question formation. With the remaining sheets she did submit, however, many of the questions referenced wanting to learn more about a particular topic or question previously mentioned – the teacher's role in education, how children learn best, the role of the environment, and the impact of parental involvement on student academic achievement. Eventually, in week six, her questions centered on finding information that would help her make connections between the different facets she had previously referenced. New questions to help her make sense of the ill-structured problem stopped in week seven, which was expected, as the final presentation was only ten days away.

Sage's questions were more limited to start. After observing at her old high school, she looked to set up another observation at a different school; her questions focused on how the teacher she planned to interview approached language barriers in her elementary classroom. At the end of week three, her questions referred to the Joy Factor and centered on ways to engage students; she identified that she wanted to see more classrooms so she could see how the Joy Factor looked in a variety of contexts. The next week, she was again focused on the Joy Factor,

this time in connection with low academic achievement and high suspension rates. Questions around the concept of the Joy Factor limited her focus; since she identified teachers as the ones responsible for creating the Joy Factor in the classroom, much of her research only looked at the role of the teacher. In week five, Sage already began asking questions about how to put the group's information together in preparation for the final presentation. With a few weeks of research left in the process, it was early for Sage to stop asking new questions for exploration of the ill-structured problem. She resumed asking some questions in week six, although they, too, were around teaching strategies linked to the Joy Factor. Her week seven questions again focused on presentation preparation. Sage's questions did not seem to have a climax or peak, and her questions did not explicitly reference any influences outside of the classroom environment.

Jasmine's trajectory of questions was similar to Sage's. Her first questions were limited to the site where she conducted her initial observation and interview. She wrote in week two that she was already stuck and having a difficult time determining her next questions or steps, not because she had too many questions but because she could not think of any new questions. Her group member suggested looking into "Beating the Odds" schools. Jasmine discovered renewed hope in this avenue, and like Sage's reference to the Joy Factor throughout her questions, Jasmine returned to "Beating the Odds" schools throughout her questions. In week three, although she mentioned learning about parental influences after attending a forum, her questions remained focused on how to come up with an action plan for the final presentation, in particular how to make the problem scenario school a "Beating the Odds" school. Jasmine did not submit a reflection sheet in week four, and when she returned to the reflection and question process in week five, she remained focused on finding resources to support the action plan she and her partner were developing for the presentation. In week six, she posed core questions that might

have been more fruitful for her to pose at the start of the process: “Why are these students in low academic standing and have high suspension rates? What are the requirements for a school to become a “Beating the Odds” school? [What criteria would a school have to meet in order for the government to recognize the school as a “Beating the Odds” school?] Why don’t certain behavior management techniques work in certain classrooms?” These core questions might have generated for Jasmine more information from which to pose deeper questions along the way. She asked them near the end of the process, which did not afford her the opportunity to explore them in as much depth as she might have if she had more weeks to research. In week seven she questioned if she was “doing this right,” showing that she did not, even at this point, understand that there is not one right way to approach the problem and not one correct solution to be found.

For all four of the participants, follow through from the previous week’s questions to research actually conducted was not always seamless. For Lilly, after the first week, she wanted to look into neighboring elementary schools and the effects of single-parent households on student achievement, but she went on instead to look at potential reasons behind teenagers dropping out of high school. For Sage, at the end of week three, she wrote that she wanted to observe more schools, but in week four, she chose to read a book to give her a better idea of strategies that align with the Joy Factor. At the end of week four, she wanted to seek out counter narratives to the Joy Factor literature, but in week five, she reported reviewing her research from previous weeks instead of seeking new information. Heather’s journey was perhaps the most sporadic. At the end of week two, she stated that she wanted to look into equity further, but she missed her reflection in week three and then reported in week four that she had been researching how children learn best and information about affect. At the end of week five, she stated that she wanted to look into teachers’ and parents’ roles in education and development of a classroom

environment; in week six, she shared reflections on government influence and the roles of standardized testing instead. Rather than seeking new information after week six as she had planned, she reported reviewing her previous research instead. Since Jasmine's questions lacked depth throughout most of the process, her follow-through was difficult to track. At the end of week two, she stated that she wanted to research "Beating the Odds" schools, and in week three she reported researching how children succeed and how to work with parents. At the end of week three, she did not pose any questions for consideration; in week four, she did not submit a reflection sheet; and in week five she reported reading a new book, with no explicit connection to "Beating the Odds" schools, which had been her thread up to that point. At the end of week five, she wanted to look into counter narratives to the information she and her partner had found up to that point, but in week six she reported working on creating the handbook for their mock school.

Overall, divergent thinking was evident in these participants' experiences, more obviously with Lilly and Heather. Divergent thinking is the ability to see many possible ways for interpreting a question and to see many possible answers to a question, not just one (Robinson, 2010, 2011). The different types of questions and paths on which the questions led the pre-service teachers evidence the potential for divergent thinking, as each of the participants could see different possible ways of interpreting the problem scenario. Jasmine focused on "Beating the Odds" schools and behavior management; Sage focused on the Joy Factor; Heather explored issues of equity, particularly with respect to socioeconomic status and the underlying structures of educational systems, including the role of government on schools; and Lilly explored how programming, environment, teacher-student-parent relationships, and school atmosphere work together in order to create a safe and engaging environment in which students can succeed. The

four participants' questions varied in type, depth and complexity, and paths. The thinking was, at times, messy or confused. However, the participants were allowed to pursue the trajectory that made sense to them as they tried to make sense of the ill-structured problem. They worked *independently* to approach, think through, and solve the problems (Pajak, 2000), within the flexible structure of problem-based learning.

### **Research-to-Problem-Scenario Connections**

An important part of pre-service teachers' development is reflection on and an understanding of the current structures of and approaches to PreK-12 education. Without an understanding of the context, pre-service teachers cannot fully think about their role in PreK-12 education; examining the many influences on teaching and learning contributes to pre-service teachers' more complete construction of a teacher identity. Evidence of reflection upon the many influences on teaching and learning and the ways those influences impact each other was present in all four participants' narratives, to varying degrees.

In Lilly's first reflection, she wondered about influences of single-parent households on students, after she observed who was picking up the children from the day care center where she worked. When her attention turned to looking at teen drop outs, she researched the influences of teachers and parents and what they communicate about grades, drug use, and teen pregnancy. She looked into how school boards handle suspensions. She later questioned the role of the media in communicating messages to teens as well. As she looked into these influences, she researched patterns of drop out rates, teen pregnancy, and drug use with respect to ethnicity, gender, and socioeconomic status. Eventually noting the significance of parental involvement and the limitations of high poverty families, she also began to take into account the role of government policies and issues of funding, as she briefly examined the No Child Left Behind

legislation. Her reflections evidenced her thinking about the intersectionality of various influences on teaching and learning as well as her role within it.

Sage referenced numerous influences on teaching and learning. In her first observation, she wrote that she found information about the number of students on free or reduced lunch, students' ethnicities, and how teachers were working to increase communication with parents. For her second observation, she chose a teacher who had found success overcoming language barriers in her elementary classroom. In her fourth reflection, she explicitly stated that there are outside influences that affect the classroom. For Sage, there was evidence of her awareness of multiple influences on teaching and learning, but her reflection did not demonstrate strong connections between the influences, how all of the influences intermingle with one another, or how her role as teacher is specifically affected.

Heather's reflections immediately demonstrated her immersion in the complexities of PreK-12 education. Her first reflection raised questions about teachers' and parents' roles in education, effects of budget cuts on schools, benefits of programming (particularly for students labeled ELL), the role of standardized testing, and the connections between socioeconomic status and academic achievement. When she discussed issues of equity in later reflections, it was accompanied by reflections and questions about class sizes, parental involvement in schools and with children outside of school, government restrictions through policies, and teacher accountability. She researched articles on the history of education, information about current government policies and legislation, and suspension rates for a local public school district. She also reflected on the emotional development of children and the roles teachers and parents play in the development, as well as connections to establishing a supportive environment for children. Heather worked to find research to support her opinions about the interconnectedness of

teachers, parents and students; she demonstrated throughout her reflections the intersectionalities underlying teaching and learning and where her role as a teacher was situated.

Out of the four participants' narratives, Jasmine's remained the most one-dimensional with respect to examining the various influences on teaching and learning. The majority of her reflections demonstrated her awareness of the teacher's role, particularly with respect to behavior management. She attended a forum on parental involvement in education and explained that she found the information to be helpful to her thinking. However, she did not further explore this influence beyond her attendance at the forum. She also mentioned that she had worked with a community organization (YMCA) for five years, working with the before/after school programs and Day Camps. Although she wrote about examining those programs, she did so for evidence of rewards systems, behavior management techniques, and elements of "Beating the Odds" schools. Through her narratives, she revealed only the start to her thinking about influences on teaching and learning, but it was not clear that she understood the impact on the structures of and approaches to PreK-12 education or how her role as teacher was affected.

Lacking among all four participants' reflections were explicit connections between the information they were researching and the relationship to the two main focus issues from the ill-structured problem – low academic achievement and high suspension rates for segments of the school population. In her week two reflection, Lilly questioned how school boards handle suspensions and how teachers and parents communicate about grades. In her week six reflection, after reading a chapter from the optional course textbook, she noted that educational failure can be linked to poverty. Sage noted in her first reflection that she believed there was a link between students enjoying what they do in school and having higher grades. In week six, she questioned whether the Joy Factor alone was enough to change academic achievement and suspension rates.

Heather read an article on suspension rates in week five and stated in week six that she wanted to find more information about suspension rates. She also wrote about wanting to find more connections between students, teachers, and parents in relation to academic achievement. She noted the flaws in standardized testing measuring achievement and academic success as well as the flaws in how the data is used to make decisions about funding. Jasmine questioned in week five the reasons behind the low academic achievement and high suspension rates, but her reflections on her research on behavior management and “Beating the Odds” schools did not explicitly link back to the core issues of low academic achievement and high suspension rates. The four participants, therefore, were aware of the fact that they needed to provide an analysis of why certain students face low academic achievement and high suspension rates in their final presentations to the board. At the start of each class session, we returned to the problem scenario as a reminder of the conditions of the ill-structured problem, and during my check-ins with teams during their group discussions, I asked questions around how the information they found and wanted to find helped them make sense of the problem scenario. However, the reflections from these four participants throughout the problem-based learning process did not provide enough evidence to demonstrate consistent meaning-making back to these two core issues along the way.

As opposed to convergent thinking, which follows a set of accepted steps to arrive at one solution, divergent thinking is free-flowing and generates many possible solutions (Robinson, 2010, 2011). Students were required to provide during their final presentation an analysis of the problem of low academic achievement and high suspension rates as well as suggestions for how the school personnel could begin to improve the situation. However, the process before arriving at the end point was free-flowing; students posed their own questions, sought their own

resources, made decisions about what information was important for them to make sense of the ill-structured problem, drew their own conclusions, and decided how to present the information to the board. While the expectation for the final presentation was to address the areas of low academic achievement and high suspension rate, there were not any rigid expectations for how to make sense of the information or how to write about the information along the way. The narratives from the four participants demonstrated the free-flowing nature of the problem-based learning process and of divergent thinking.

### **Conclusions**

*Professional dispositions are part of a teacher's identity, influencing how she sees herself and her professional responsibilities... We believe that the construction of professional identity for teachers must also be rooted in a broader and deeper view of what is required of teachers in a democratic society. The professional identity of a given individual can be viewed as a melding of her role (e.g., what the "good teacher" is expected to be like and be able to do) and how she projects herself in that role... Developing the intentionality and agency that constitute professional identity comes from being in touch with both external expectations and one's own internal decision-making processes.*

*~Diez & Murrell Jr., Teaching as a Moral Practice, 2010, pp. 12-13*

The narratives from Lilly, Sage, Heather and Jasmine provided evidence of their four different paths to making initial discoveries of the complexities of teaching and learning and the expectations of teachers. We witnessed their divergent thinking patterns in response to an ill-structured problem, and through their reflections, learned where they have begun to place themselves within the multi-dimensional context of PreK-12 education. The structures of a problem-based learning curriculum in ED 100 created spaces for these pre-service teachers to

begin exploring the structures of and approaches to PreK-12 education in free-flowing ways and through multiple (and sometimes unconventional) sources of information. While sometimes messy or confusing, all four of these pre-service teachers were able to approach, think through and provide solutions to the ill-structured problem independently (Pajak, 2000).

All four participants were able to ask a range of questions (some wider than others), and the participants sought (some) information for most of the questions they asked. It is important to note that there was more evidence of the pre-service teachers asking different kinds of questions than evidence of their going deeply into the questions through their research. The benefit, then, of the problem-based learning process and of divergent thinking, in the case of this course with these participants, is not in the pre-service teachers' *answers* to their questions but in their *ability to ask* the questions that uncovered the complex factors influencing the problem scenario (and teaching and learning in general). As students in ED 100, the first Education course in the sequence of required coursework, it is critical that pre-service teachers know how to *independently* ask thoughtful questions to uncover and to raise their *awareness* of the complexities of the field of education.

The independent nature of the problem-based learning curriculum, free from the control of the professor (who, in most cases, decides what questions are important to pursue, what resources should be accessed, and what steps should be taken to arrive at solutions to problems), allowed the pre-service teachers to use their personal experiences with education as valid sources of information. In doing so, these pre-service teachers started their process by first examining their values and beliefs. They started with what they knew and discovered discontinuities and questions that pushed them to wonder about what they have not yet seen, heard about, or experienced. They were not pressured to echo what they heard in a lecture or limited by a short

reading list. Instead, they had to make sense of where they started with their ideas of PreK-12 education, who and what influences teaching and learning contexts, and how they projected themselves into those spaces (Feiman-Nemser & Schussler, 2010).

The timing of when the pre-service teachers experience the freedom and flexibility of a problem-based learning curriculum is important. The participants in this research study were extremely early in their Education coursework, enrolled in the first required Education course. My previous experiences with the course had shown me that they are eager to hear what the professor has to say about what they have to do to be a good teacher. They look first (and sometimes only) to the professor and his/her chosen textbooks, guest speakers, etc. for their information, and because of the trust they place in the experts, readily accept what they hear as “Truth.” They embark upon the rest of their Education coursework pursuing more of other people’s questions and fewer of their own. Experiencing a problem-based learning curriculum so early in the sequence of Education courses sets pre-service teachers on a path where it is acceptable to ask their own questions, discover their own sources of information, and build a sense of themselves as teachers. Lilly, Sage, Heather and Jasmine might not have answers to all of their questions as they leave ED 100, but they can continue onto more traditionally structured Education courses with their questions and use the more formally structured opportunities to continue seeking information and situating themselves in the contexts of PreK-12 education, or if they continue onto courses using a problem-based learning curriculum, can use that time and space to continue to explore and make connections.

Rather than being told what professional dispositions are critical for PreK-12 teachers to possess and *adopting* them through parroting what they see and hear at such an early stage, Lilly, Sage, Heather and Jasmine began *developing* professional dispositions (Fallona & Canniff, 2010;

Johnson, Evers, & Vare, 2010) through navigating their own questions about and explorations of educational contexts and their roles within them. These pre-service teachers began the process of orienting themselves to the responsibilities of teachers (Diez & Murrell Jr., 2010) and building a sense of who they are as pre-service teachers. Each weekly reflection illustrated one more step toward developing and understanding their professional identity. Since they were so early in their coursework and field experiences, that professional identity was far from fully formed. They had not acquired, through their engagement in problem-based learning, all of the necessary dispositions. They had, however, been given a chance to explore a problem, ask important questions, discover complexities, and begin to build their sense of self as teacher.

Developing professional dispositions, and the interrelated knowledge and skills, is a process that takes time (Feiman-Nemser & Schussler, 2010). Lilly, Sage, Heather and Jasmine did not yet have a fully formed professional identity coming out of their experiences with problem-based learning. They still have much to learn about the structures of and approaches to PreK-12 education; they continue to develop their understanding of what it means to be a teacher and how they project themselves in that role. However, as a result of their experiences with problem-based learning, they had discovered and were developing their ability to think divergently, and teachers who are able to think divergently can accomplish change through thinking about many possible approaches or solutions and anticipate potential pitfalls (Pajak, 2000). Lilly, Sage, Heather and Jasmine are now situated in "...the nested contexts of teaching – school, profession, community, and society [that] help create and affirm professional identity and practice" (Diez & Murrell Jr., 2010, p. 13). Time and future experiences (in both problem-based learning contexts and more traditional contexts) will further solidify who they each will "be" as PreK-12 teachers.

## Implications

Facilitating a problem-based learning curriculum is challenging; there is a fine line between providing guidance to the participants and controlling their learning experiences. It was tempting throughout the process to tell the students a name of an educational theorist rather than to ask them questions and help them think through the process of how they might go about finding recognized theorists in the field of education. It was also time consuming; I often wondered if the participants' time could have been better spent if I simply told them not to ask the questions they were asking. However, I also recognized the value in the questions they asked, even if (or especially because) they were not necessarily the questions I thought were important. I wished, though, that the participants would have had at least a few more weeks to grapple with the problem scenario. Many of the teams were more focused and comfortable with the process toward the end of it, and they likely could have been more productive had they been allowed to continue their research instead of present because it was the end of the semester.

I often had to remind myself that the pre-service teachers were taking their first Education course. With that, I had to remind myself that it was often more important *that* they were asking questions (instead of relying on me to supply the questions) than how focused their questions were or how deeply they delved into the information they uncovered. I knew that they were not learning everything they could about multicultural education, but I also knew they had many more courses ahead of them in the program, and I knew they were making connections to what they were learning about multicultural education. Having taught the course previously, I was always disheartened by the final presentations during which pre-service teachers would simply regurgitate the terminology and concepts from the text and from what they heard from me

and from the guest presenters. Nearly every presentation sounded the same. The same was not true of the presentations at the end of the problem-based learning process.

Students received guidance and support throughout the problem-based learning process. Each week, I had the opportunity to talk with students as they worked with their teams, discussing their findings, making connections and setting new goals. I made suggestions to all groups around what sources of information might help them achieve a balance in perspectives, as well as what sources might be considered more valid or recognizable by scholars in the field. Rather than suggesting that they include educational theory or use a particular source of information, however, I should have made it an expectation that they include it. I did not have to tell them which one(s), but I could have told them to have it.

The participants were always encouraged to pursue the questions that arose for them as they learned new bits of information about multicultural education. However, in retrospect, I could have been more clear around my expectations for the questions; I believe students thought they had to have new questions every week, when, in reality, pursuing the same questions or devising sub-questions related to previous questions would have been acceptable (and more focused).

With that in mind, the students could have benefitted from more explicit criteria for engagement in the process of the problem-based learning process. While the participants had clear criteria for the final presentation, there were not any criteria providing guidance or communicating expectations for the process of getting to the final presentation. Similarly, students would have benefitted from criteria around question formation. As the facilitator, I should have spent more time helping the pre-service teachers think about how to ask thoughtful questions. Just as they had not previously participated in a problem-based learning process, many

of them had never received any explicit instruction around how to ask questions. Since independently-generated questions lie at the heart of the problem-based learning process, the facilitator needs to take the time to prepare students to be successful in doing so.

Giving the participants access to a body of literature prior to engaging in the problem-based learning process would have been beneficial for them as well. Perhaps the facilitator could assign readings and facilitate student discussions about the readings as a way to introduce the pre-service teachers to the topic or field before they receive their problem scenario. Since these students were in their first Education course, they came with little to no background on the concepts, terminology, and core issues surrounding multicultural education. Laying a foundation with students might allow them to better engage with the problem scenario once they get to the problem-based learning process. Instead of having to take time out of the process to discover what multicultural education *is*, they could, instead, spend more time analyzing and evaluating the issues around it.

## Paper 3

### Problem-Based Learning, Multicultural Education and Self-Awareness

#### **Introduction**

In the spring semester of the 2011-2012 academic year, I began teaching “ED 100,” the first required Education course for all candidates at “Ortler College” pursuing a major or a minor in Education. This course was designed to fulfill state certification requirements related to human relations codes. It has a split focus; the first one-third of the course focuses on developing the abilities required in order for Education candidates to pass the Pre-Professional Skills Test (PPST<sup>®</sup>), a state requirement for teacher certification. The remaining two-thirds of the course are devoted to exploring multicultural education and serving diverse students.

As stated in the syllabus, the goals of this course, related to the latter focus, are to acquire the skills to work effectively in a variety of environments with people of diverse backgrounds; to identify the resources available within the community to assist in addressing the needs of diverse students; and to analyze individuals’ skills, values, and interests as they relate to multicultural education and serving diverse student populations. According to the outcomes stated in the syllabus for ED 100 students are expected to *acknowledge* some of the complexities of culture and of multicultural education and be *aware of* some of the factors influencing teaching and learning. They are expected to *begin* to understand themselves presently as well as to *start* to think about themselves as professionals within the complex environments of PreK-12 education.

I taught the course for three semesters using guest speakers to highlight issues relating to multicultural education and serving diverse students; I drew on one textbook focusing on one model of multicultural education, particularly how fostering esteem, empathy and equity is the basis of serving diverse students (Tiedt & Tiedt, 2009); whole class and small group discussions

of the text and guest speakers; individual written reflections to process readings and guest speaker presentations; and a case study of a local urban dual language public elementary school. In those semesters facilitating ED 100, I found that, in students' end-of-semester reflections, many simply repeated the ideas they had read in the text or had heard from guest presenters. I became concerned that these pre-service teachers were not generating any unique perspectives about or internalizing any concepts related to multicultural education and were not developing any personal commitment to serving as change agents in their future classrooms. I was convinced that they only were echoing what they had heard from others, from those they believed to be authorities. I began to wonder:

- In what ways could a problem-based learning curriculum create a space for a pre-service teacher to begin to formulate her own definitions and understandings of multicultural education?
- How does a growing awareness of multicultural education influence a pre-service teacher's development and awareness of self-as-teacher?

To explore these questions, I wanted to create a space where students could explore the course concepts without an emphasis on "the Truth" as represented by pre-selected textbooks and the professor's and guest speakers' presentations. I implemented in ED 100 a problem-based learning curriculum in the fall semester of the 2013-2014 academic year, posed an "ill-structured problem" to the students, and allowed them the opportunity to "struggle" with "complicated real-world issues" (Checkley, 1997, p. 1).

### **Research on Teacher Development and Multicultural Education**

There exists no one correct way to approach teacher preparation. However, the International Alliance of Leading Education Institutes (2008), along with many leading scholars

(Ball, 2006; Gorski, Zenkov, Osei-Kofi, & Sapp, 2013; Larkin & Sleeter, 1995; McIntyre & Byrd, 2000; Noel, 2008; Orlofsky, 2001), has identified key elements for developing teachers. The first is to develop pre-service teachers' "capacity for reflective practice, critical inquiry, information literacy and professional engagement in learning communities." Another is to prepare them to "better address issues of equity, inclusion, diversity and social justice" (p. 10).

Differences in approaches to developing pre-service teachers can be traced back to tensions around *perceived indoctrination* and *formation or transformation* of pre-service teachers. The former speaks to the imposition of the professor's values and beliefs on the pre-service teacher, and the latter speaks to bringing pre-service teachers into contexts and professional environments that allow them to uncover their own values and beliefs and to recognize the place of both within the professional environment (Diez & Murrell Jr., 2010). At the core, indoctrination is rooted in the one voice of authority, and the formation or transformation of the pre-service teacher requires a process of coming to know oneself as teacher through meaningful dialogue between and among various individuals. Transformation is a process of internalization that simply cannot occur through a mechanical imposition (Ball, 2006; Ladson-Billings, 1995). Shifting from indoctrination to a more formative and dialogic learning environment creates opportunities for pre-service teacher candidates to uncover and examine their values and preconceptions (Feiman-Nemser & Schussler, 2010), allowing for the *development* (rather than the *adoption*) of humanizing dispositions so critical to the formation of teacher identity (Levinson, 2000).

The core of teachers' humanizing dispositions needs to be built upon a commitment to social justice (Gorski et al., 2013; Murrell Jr., Diez, Feiman-Nemser, & Schussler, 2010). In order for pre-service teachers to engage in the possibilities of social justice, however, Gorski et

al. (2013) asserts that pre-service teacher candidates need more than brief and isolated experiences with issues concerning race, class, gender, sexual orientation and ability. Humanizing dispositions well-suited to multicultural education are cultivated through experiences with marginalization as the focal point, not the add-on (Stovall, 2013). While multicultural education does not come “packaged” as a specific type of curriculum to implement, the strategies at its foundation encourage students to develop the ideas, processes, skills and ways of thinking necessary to recognize social injustices on a local, regional, national and global scale to effect change.

Education is situated within and intertwined with the political, economic, and cultural aspects of everyday life, and as Levinson (2000) contends, prospective teachers need to envision themselves within this situated human activity and understand what role they will play. The structure of educational systems often parallels society as a whole, and the construction of knowledge occurring within the school also tends to be socially (re)produced (McCarty, 2002). Giving pre-service teachers opportunities to reflect on the ways their own education has shaped and influenced them has the potential to raise their awareness of how they might be situated within these socially produced spaces and to be able build a sense of how they will function within the space, particularly with the goal of social justice education (Ball, 2006; Gorski et al., 2013; International Alliance of Leading Education Institutes, 2008; McIntyre & Byrd, 2000; Noel, 2008).

Grant and Zozakiewicz (1995) contend that for pre-service teachers to fully develop a multicultural education orientation, they need to understand themselves through both retrospective reflection and introspective self-examination. Both retrospection and introspection become more meaningful to pre-service teachers if they are given the opportunity to grapple with

problems facing education and society today. Teacher candidates need to be actively involved in the process of exploring problems, because, as Orlofsky (2001) notes, more can be internalized through doing, rather than reading about, hearing about or thinking about doing. Through inquiry into these problems, pre-service teachers learn to identify and address power imbalances that exist within schools. They learn how to become readers of power from reflecting on how they have been influenced by educational contexts as well as on their potential influence as teachers (Allan, 2008; Ball, 2006). Often, as Blumenfeld (2013) points out, many pre-service teachers understand issues of power, control and oppression, but their view of the issues remains too limited. They have trouble seeing the larger, more complex and intersectional issues; Orlofsky (2001) advocates for opportunities for pre-service teachers to expose and think critically about the societal and institutional foundations of oppression, even if the process is uncomfortable.

In essence, the goal, through retrospection and introspection, is for pre-service teachers to gain a clearer sense of their evolving identity(ies) and of their role in PreK-12 education. With a clearer sense of their identity(ies), they can make informed decisions when planning for, implementing and assessing instruction within a multicultural education setting (Noel, 2008). With a clearer sense of the educational contexts they will enter, they are also more likely to understand what forces influence planning, implementing and assessing instruction, realizing that, “teaching methods are related with complex issues regarding the nature of student knowledge and teacher knowledge, the classroom environment, school policies and society, and what may constitute worthwhile knowledge and interaction” (Tochon, 2011, p. 13). With greater understanding of the connections between social, political and economic forces shaping education, pre-service teachers can respond to the root causes of inequities, rather than the symptoms of injustice (Noel, 2008; Orlofsky, 2001; Osei-Kofi, 2013).

The goal of a *problem-based learning curriculum* is to foster in students the ability to think critically, solve problems effectively, find and evaluate relevant resources, work collaboratively, develop communication skills, and work to become self-directed and continual learners (Duch, Groh, & Allen, 2001; Edwards & Hammer, 2004; Savery, 2006). At its core, problem-based learning relies upon the “ill-structured problem,” modeled after authentic problems students would likely face in the field, to motivate students to engage in free inquiry. The ill-structured problem scenario requires that students work collaboratively and engage in reanalysis of the problem and of the information gathered during the research process. The problem scenario is messy and incomplete, and students are responsible for asking questions, determining and seeking resources, and discovering the complexities of “real world” problems. Teachers/professors take on the role of tutor, relinquishing the authoritative voice in the classroom, monitoring students’ progress and assessing their work, but not providing information or a definitive route to take to construct a solution to the problem (Duch et al., 2001; Levin, 2001; Savery, 2006).

The social conflicts and inequities that have thus far shaped education are complex and messy as well; they are not matters easily tamed (Eghigian, 2000). Current approaches to preparing teachers for this work, however, have teachers/professors controlling the amount of exposure to the complexities pre-service teachers will encounter during their development. Teachers/professors limit the perspectives pre-service teachers can (must) take when they determine what questions to ask and what should be learned (Eghigian, 2000; Stiker, 2002). Considering the potential of problem-based learning, however, pre-service teachers can directly confront problems and can explore independently what is possible and what kinds of alternatives do or could exist as they begin to think about how they might reconstruct schools and society.

They learn to articulate their own goals for social justice as well as how they might approach their work toward the goals (Burch, 2001; Sleeter & Grant, 1994).

Just as the factors shaping PreK-12 education are complex, decisions about the most effective ways to prepare pre-service teachers for multicultural education are complex as well. Much consideration should be given to the benefits of a particular curriculum approach matched to the developmental levels of the pre-service teacher candidates. Schools of education should begin to think about at what point in pre-service teachers' development it is valuable for them to engage in more open explorations of concepts and issues and when it is more beneficial to experience a more traditional approach, during which pre-service teachers could rely more on professors' facilitation of and navigation through pre-selected concepts and issues. There is no one effective approach to teacher development, and not every teacher education course in the sequence needs to implement the same curriculum; in fact, varying approaches throughout the program according to pre-service teachers' developmental levels and needs could prove to be the most powerful.

The research does not support and I do not advocate for teacher education programs to exclusively adopt a problem-based learning curriculum. If the exclusivity of the current, traditional approaches is not most effective in developing pre-service teachers, the exclusivity of problem-based learning approaches would not be most effective, either. However, there is room for and benefits of including problem-based learning as *part* of pre-service teachers' development.

This research study focuses on one pre-service teacher's experiences with problem-based learning and development around her initial understandings of multicultural education and her awareness of her self-as-teacher. It occurs in the very first required Education course and so

documents the very beginning of her development. With that in mind, I selected Russian philosopher M. M. Bakhtin's ideas around perception and development as a way to make sense of the narratives from one pre-service teacher.

### **Conceptual Framework**

In his early philosophical essays, Russian philosopher Mikhail M. Bakhtin (1895-1975) explored his notions of architectonics (the study of how entities relate to each other) and of aesthetics (the problem of consummation – how parts are shaped into a whole) (Holquist, 1990, p. x). Tightly woven into his explorations of architectonics were Bakhtin's ideas around perception and awareness. He asserted that human beings are only capable of *situated* awareness, as they occupy a particular time and space in the world. As Bakhtin (1990) explained,

This ever-present *excess* of my seeing, knowing, and possessing in relation to any other human being is founded in the uniqueness and irreplaceability of my place in the world. For only I – the one-and-only I – occupy in a given set of circumstances this particular place at this particular time; all other human beings are situated outside me. (p. 23)

This “excess of seeing,” for Bakhtin, creates a unique relationship between *perception* and *cognition*,

For what the actual perception of a concrete whole presupposes is that the contemplator occupies a perfectly determinate place, and that he is unitary and *embodied*. The world of cognition and every constituent in it are capable of being thought, but they are not capable of actually being perceived. (1990, pp. 23-24)

Because of their situated awareness and the limitations on seeing, human beings cannot completely know a concrete whole but only perceive themselves in relation to it. Bakhtin concluded that there are “two possible ways of combining the outside world with a human being:

from within a human being – as his *horizon*, and from outside him – as his *environment*” (1990, p. 97). The relationship between objects or ideas and one’s horizon or environment cannot be a consummated relationship, as one’s situation changes every moment, as does one’s environment (1990, p. 98). An individual’s understanding is a perception, and one is always in a state of becoming (Holquist, 1990, p. xix). Bakhtin posited:

My own unity, for myself, is one that confronts me eternally as a unity-yet-to-be. It is a unity that is both given and not given to me, a unity that is incessantly conquered by me at the sharpest point of my self-activity. It is not the unity of my having and possessing, but the unity of not-having and not-possessing; not the unity of my already-being, but the unity of my not-yet-being. (1990, p. 126)

The concept of a unity-yet-to-be highlights the iterative process of development and identity formation. It is a process marked by being unconsummated at the beginning and at the end. According to Bakhtin, “in order to live and act, I need to be unconsummated, I need to be open for myself – at least in all the essential moments constituting my life; I have to be, for myself, someone who is axiologically yet-to-be, someone who does not coincide with his already existing makeup” (1990, p. 13). The idea that one is perpetually under construction and constantly shaping parts into a whole emphasizes the idea that the parts can never be and should never be erased in an effort to achieve a whole (Holquist, 1990, p. xxxii).

My research focuses on the implementation of a problem-based learning curriculum in ED 100, the first required Education course for Education majors and minors. The students in the course and the focus participant for this study were at the very beginning of their development as pre-service teachers. I was interested in how they began to make sense of what they knew of teaching and learning as it related to new information they discovered throughout the problem-

based learning process. I was cognizant of the fact that these pre-service teachers were only just beginning their processes of consummation; they were not expected to shape all of the parts into a whole, but, rather be aware of what parts existed.

### **Research Context**

The context for this research is a small, private college situated in a large urban/metropolitan city in the Midwestern United States. I call this institution “Ortler College.” Ortler has roughly 2,000 students enrolled in its undergraduate programs and offers over 60 undergraduate areas of study, organized into four schools, School of Arts and Sciences, School of Business, School of Nursing, and School of Education. Class sizes average 20-25 students.

Ortler is an ability-based learning institution. Students college-wide do not receive letter grades as an evaluation of their performance. Instead, they receive narrative feedback in relation to explicit and transparent criteria for all performance-based assessments. They are also offered the opportunity to earn validations for the eight core “Abilities” offered college-wide. These Abilities are Communication, Analysis, Problem-Solving, Developing a Global Perspective, Effective Citizenship, Aesthetic Engagement, Social Interaction, and Valuing. Each Ability has four undergraduate levels, and each course offers validation opportunities for different levels of different Abilities, depending upon the focus and work to be completed.

Students have the opportunity to pursue a major or a minor in Education, depending upon the license they wish to earn at the completion of the program. Early to Middle Childhood (grades PreK-6) and Middle Childhood to Early Adolescence (grades 1-8) candidates pursue a major in Education and a minor in a content area, such as Social Studies, English Language Arts, Science, Mathematics or Spanish. Candidates pursuing an Early Adolescence to Adolescence

license (grades 6-12) major in a content area and minor in Education. Art Education majors pursue a K-12 license and do not have to declare a minor.

The stated outcomes for ED 100 relevant to this research study are as follows. Students are expected to:

- Develop a *personal* awareness of self (values, personality, cultural background, interests, skills, etc.) as related to various *diverse communities* that are a part of society.
- Develop an emerging awareness of cultural identifiers and their influences on people's lives.
- Understand what diversity means and includes in a pluralistic society.
- Develop an *educational* awareness of self (values, personality, cultural background, interests, skills, etc.) as part of a *professional learning community*.
- Develop an emerging awareness of culture and its influence on student learning.
- Understand the multicultural factors that affect student learning and what it means to be a culturally competent educator.
- Increase their awareness of multicultural teaching strategies to use in the PreK-12 classroom.

In essence, students in ED 100 are expected to *acknowledge* some of the complexities of culture and of multicultural education and be *aware of* some of the factors influencing teaching and learning. They are expected to *begin* to understand themselves presently as well as to *start* to think about themselves as professionals within the complex environments of PreK-12 education.

I implemented a problem-based learning curriculum in the fall semester of the 2013-2014 academic year. A total of sixteen students were enrolled at the time of the implementation of the

new curriculum. All of the enrolled students were female. Eight students were listed as second-semester freshman-status, five students were listed as first semester sophomore-status, and three students were listed as first semester junior-status. The majority of the enrolled students were White (10); there were five Hispanic students and one Asian American student enrolled.

## **Methodology**

### *Procedure*

To frame my research, I focused on the following questions:

- In what ways could a problem-based learning curriculum create a space for a pre-service teacher to begin to formulate her own definitions and understandings of multicultural education?
- How does a growing awareness of multicultural education influence a pre-service teacher's development and awareness of self-as-teacher?

In order to study these questions, I implemented a problem-based learning curriculum into ED 100, the first Education course for all Education majors and minors. I engaged in a narrative inquiry of participants' weekly reflections and bi-weekly response papers written throughout the semester.

The ill-structured problem-scenario I provided to students was adapted from Lee Shumow's (2001) work with an introductory undergraduate course in Educational Psychology (Levin, 2001, p. 29):

*A local school has a 63 percent "minority" population (35% African American, 18% Hispanic, and 10% Hmong). Most (75%) of these minority students come from low-income families, whereas only 6% of the white students in the school come from low-income families. A majority (85%) of minority students is performing considerably below average academically, and the minority student suspension rate is five times the majority student suspension rate.*

*An advocacy group has begun picketing at the school and is seeking ways to eliminate state funding for the school in an effort to close it. It claims academic ability grouping is a form of segregation and that the low achievement scores are indicators of discrimination.*

*A coalition has also expressed concern. It has called upon its membership to support the school in its attempt to address inequities and raise achievement of minority children.*

*The school board has promised the community that they will solve this problem fairly. Their plan is to use the services of educational consultants to help them identify the source(s) behind the low academic achievement and high suspension rate and to work with the staff to help all children succeed.*

*You are one of the groups of consultants working on this “case.” You were selected because of your commitment to improving learning among all students. On December 10, you will meet with the school’s leadership team to present your analysis and suggestions.*

Students were arranged in groups of four. In creating the groups, I attempted to mix the licensure areas so that each group had at least one member pursuing an Early to Middle Childhood, a Middle Childhood to Early Adolescence, an Early Adolescence to Adolescence license, or a K-12 Art Education License. Each team was labeled with a color – Blue, Yellow, Purple or Pink.

Students received the ill-structured problem-statement after learning a bit about what problem-based learning is, including the role of students, the role of the professor, and the ways they would be assessed throughout the process. They had an opportunity to discuss their concerns and to clarify with me any confusion regarding this curriculum, as this was the first time all of the students in the class had experienced problem-based learning.

After receiving the ill-structured problem statement, students brainstormed questions within their collaborative teams, focusing on what they needed to learn in order to make progress toward identifying the causes behind the problem and making suggestions to the leadership team to improve the situation. These questions were shared with the collective whole before more team-based question formation continued.

Coming into the second class session, students were asked to continue generating questions for consideration as well as to generate ideas for resources they might use to begin finding information or answers to their initial questions. In the second class session, individuals shared their questions and ideas for resources with their teams and then shared with the collective whole.

Each week, teams needed to meet together to complete a goal setting sheet. Guided by prompts, teams set a group goal and determined what individual steps would be taken toward the group goal. Teams crafted a rationale to support why they set both the group goal and the individual steps to be taken toward the goal. Throughout the semester, teams created a total of seven goal setting sheets.

Also on a weekly basis, students individually reflected on the group goal, individual progress made toward the group goal and new questions to explore as they reflected on what they learned and what they still wanted or needed to learn. For the weekly reflection sheets, each individual responded to three questions, designed to support reflection on the work that was done and to generate thinking about the next steps. Again, they completed a total of seven weekly reflection sheets.

Students also wrote bi-weekly response papers (a total of four), each responding to a prompt I provided them. In the response papers, they drew on their experiences and any research they might have done for this class, other classes, or personal/professional development outside of the academic context. I designed the questions as a way to encourage students to reflect on concepts related to (for me, at the heart of) the problem scenario. While I did not explicitly tell students of the connection between the bi-weekly response paper prompts and the issues they could be considering as they explored the problem scenario, I did ask them to reflect on the work

they had been doing around the problem scenario and to bring in specific examples of what they were learning throughout the problem-based learning process, as they discussed their responses to the prompts. They were also asked to consider what they included in their response papers as they worked with their group members to set any upcoming goals or questions for consideration around the problem scenario. In essence, the types of prompts I provided for the response papers and the expectations I set for students around the approach to the response papers served as one way I was able to provide guidance to students during the problem-based learning process. The response paper prompts were as follows:

- What is multicultural education? What is a teacher's role in multicultural education?
- Explain what you think "diverse needs" means or includes. How can or should teachers address students' diverse needs? What limitations exist? What approaches are effective (and how does one measure effectiveness)?
- Complete the following two sentences:
  - All learners learn best when...
  - All teachers teach best when...
- What is the purpose of education? Where do you see yourself within this scheme? / What is your role?

For class meeting sessions, groups worked together on exploring resources, generating questions, conducting observations in the field, conducting interviews, discussing individual progress and/or discussing weekly goals. While students were not required to report to the classroom every week (they could use the time to conduct field observations or interviews, for example), most chose to use the class time to collaborate with their group. They often conducted their observations, interviews, etc. on their own time between class sessions.

During final assessment week, groups presented their analysis and suggestions to a group of professors from the College, role playing as the school board for the school described in the ill-structured problem. As a problem-based learning curriculum does not define the product students must generate, groups were able to decide how they would share their information. One group created and navigated a website during the presentation, another group created a school handbook, and the remaining two groups created Prezis to guide their presentation. After sharing their analysis and suggestions, board members and classmates posed questions to the presenters.

### *Participants*

After students completed the course and final progress codes were submitted, all of the enrolled students received information about my research study. At that time, I asked for volunteer participants in my narrative inquiry. Consenting to participation included giving me permission to use the weekly goal setting sheets, weekly reflection sheets, bi-weekly response papers, notes I took about the group discussions, and materials from the final presentations. It also gave me permission to interview them. Twelve of the 16 students in the course, representing the four different collaborative teams, consented to participate in the narrative inquiry. Four students were from the blue team, four students were from the yellow team, two students were from the pink team, and two students were from the purple team.

### *Data Generation and Collection*

For those participants who consented to participating in my research, I engaged in document analysis of the problem-based learning curriculum materials implemented as well as the collection of documents produced throughout the semester. The purpose of document analysis was to explore the ways individuals talked about multicultural education (e.g. terminology, characteristics, and purposes). I also used document analysis to note patterns of

change in individuals as they reflected on multicultural education and the role of teachers. I took note of similarities in progression between individuals as well.

### *Narrative Inquiry*

Narrative inquiry afforded me the opportunity to gather participants' reflections as data. Chase (2010) speaks to the overall experience of the narrative inquiry and narrative inquirer:

...Narrative researchers treat narrative – whether oral or written – as a distinct form of discourse. Narrative is retrospective meaning making – the shaping or ordering of past experience. Narrative is a way of understanding one's own and others' actions, of organizing events and objects into a meaningful whole, and of connecting and seeing the consequences of actions and events over time. (p. 214)

My research focuses on how the participants made sense of the ill-structured problem presented to them, specifically their thinking about how their research shapes their responses to prompts guiding the bi-weekly response papers. It also looks at pre-service teachers' growing awareness the complexities of PreK-12 (multicultural) education. Finally, my research examines how pre-service teachers begin to build a sense of themselves as teachers. Since “consciousness and identities are not matters that lend themselves to precise measurement” (Perry, 2002, p. 199), narrative inquiry afforded me the opportunity to study the unique individuals rather than be forced to draw sweeping conclusions.

For this paper, I chose to focus on one participant's narrative responses to the bi-weekly prompts, looking at the ways Rose discussed multicultural education and her role as a teacher. I chose this student (“Rose”), a sophomore-status Education major, as a case study because she represents categories typical of other candidates at Ortler pursuing an Early to Middle Childhood license. She is a White, middle class, heterosexual, native English speaker from a local suburb

near the College. Despite representing many shared characteristics of those pursuing a similar degree at this particular institution, it is important to note that Rose's narratives are not intended to speak on behalf of the narratives of any of the other participants from ED 100 who also engaged in the problem-based learning curriculum. There was not a "typical" response Rose could represent, as the problem-based process fostered independent reflections based on individual and unique experiences. What follows is how a "typical" candidate made sense of multicultural education and her role as a future teacher.

### *Data Interpretation and Analysis*

For data interpretation and analysis, I engaged in inductive and deductive methods of analysis (Graue & Walsh, 1998). After preliminary readings during which no coding took place, I read through the data numerous times, identifying connections between the weekly reflection sheets and the bi-weekly response papers and patterns between the response papers in the ways the participants talked about multicultural education. Examples of patterns were discussions of equality (vs. equity), students' and teachers' attitudes toward difference, students' and teachers' roles, classroom and beyond-classroom benefits, limitations and discussion of barriers, student motivation, and factors of diversity. Once I coded these patterns, I read through the data again to verify themes and pursue threads that would provide a coherent way of thinking about the research (p. 163).

I also read the data and patterns against my personal and professional knowledge, particularly knowledge of ED 100, as I had previously taught the course using a different curriculum and approach to learning. I also read the data against professional literature on problem-based learning (Barrows & Tamblyn, 1980; Duch et al., 2001; Edwards & Hammer, 2004; Levin, 2001; Murray-Harvey & Slee, 2000; Savery, 2006) and against literature on the

development of multicultural educators (Ball, 2006; Gorski et al., 2013; Larkin & Sleeter, 1995; Noel, 2008). This literature, taken together, examines the types of experiences teacher educators might offer to pre-service teachers to foster their development of a multicultural education orientation, and how problem-based learning as a curricular approach can offer spaces for this development.

### **Participant Reflections**

After having been introduced to the ill-structured problem and working with team members to determine initial questions the problem raised for them, students in ED 100 were asked to write their first response paper, explaining what they thought was meant by multicultural education and identifying a teacher's role in multicultural education. Before Rose wrote her first response, she had completed her first identified step in the research process. She conducted observations at a suburban high school about thirty miles from the College, looking for evidence of inequalities in classrooms and during the lunch hour.

In response to the first set of prompts, she wrote,

Multicultural education is education based on equality, justice and freedom for everyone. Schools based on multicultural education build their school policies, practices and curriculum to ensure equal opportunity and achievement for all students. Building a strong, positive attitude towards the history and cultures of different groups by educating students on diversity will assist in guaranteeing every individual feels they are [sic] accepted and respected.

She cited from the optional course textbook (Tiedt & Tiedt, 2009), which uses the idea of a tossed salad to represent diversity in the United States. Rose explained that each individual brings unique characteristics to the classroom, and it is the teacher's responsibility to get to know

his/her students, to educate them about “diversity and acceptance,” and to make their students “aware of how multicultural education will benefit them and help them grow, how it will strengthen their work ethic, how multicultural education will build a better world and who they can turn to for help or additional education on diversity.”

She went on to identify that diversity includes “different ethnicities, sexual orientations, religious beliefs, cultural traditions, factors that may be affected by age and/or sex, and social class standing” and explained that, in order to “give” students the information they need to be accepting of differences, teachers “must be knowledgeable in diversity and welcome all students and the different lifestyles they may bring into the classroom.” As evidence to support her claim that “multicultural education must be applied not only in the classroom, but throughout the entire school community, such as team sports and organizations,” she cited a news story about a high school football coach who kicked the majority of his players off of the team because of their bullying behavior in school and online. Later, she explained that administrators at a local high school recently addressed issues of age discrimination during pep rallies, ending the long-standing practice of upper classmen chanting “stupid freshmen” to intimidate the underclassmen.

She asserted that “teachers must be aware of bullying, racial slurs or jokes; [sic] and act accordingly to put an end to discrimination in the school” because she believes (without providing evidence in support) that students who feel safe and welcome will be more engaged in school. From this line of reasoning, she identified that she wants “every student to attend school with a positive outlook and the will to learn, without the stress of feeling unaccepted or the concern of being intimidated or harassed.” Her first response paper ended with an assertion that “the knowledge students will gain in the classroom will extend out into the community making students more successful in the future.”

In the time between Rose's first response paper and the second, she and her group members set additional goals and conducted observations, interviews and surveys to gather information in response to their questions. Rose and one of her group members also attended a community conference, "The Art of Happiness," hosted by Ortler with key speaker Parker Palmer. Representatives from Ortler's School of Education facilitated a session entitled "Happiness in K-12 Schools: The Joy Factor;" Rose and one of her team members attended this session during the conference. The bulk of the information Rose reported during this time period related to what students have to say about qualities of effective teachers, and she claimed that "teacher qualities clearly play a large role in the Joy Factor in schools." The teacher qualities she reported in her weekly reflection sheets reappeared in her second response paper, organized around prompts about serving students' diverse needs.

Rose began her second response paper explaining what "diverse needs" meant to her:

Diverse needs are this idea that everyone, regardless of gender, race, social standing, sexual orientation or cultural background is granted the chance to achieve. Diverse needs goes hand in hand with equal opportunity. Each teacher needs to be accepting of the different cultures, experiences and interests that every student brings to the classroom; [sic] and teach them in a way that is suitable for their learning experience.

There was a great deal of overlap here in her explanation of "diverse needs" and her previous reflections in the first response paper about multicultural education and the role of the multicultural educator. She went on to identify some specific strategies for determining students' diverse needs – conducting student inventories, having students create an All About Me poster, and keeping a portfolio of student work.

She asserted, “in order to provide the equal opportunity that every student deserves, it’s in the hands of the teachers to make changes to curriculum, assess using different methods or use various teaching apparatuses.” Rose also advocated for giving students choices in how they demonstrate their knowledge, setting goals for students, and being clear with expectations for their learning experiences. She cautioned that “teachers need to be aware that not all students are exposed to the same privileges and resources, so lesson plans may have to be altered,” referencing access to technology, transportation, and language barriers as potential limitations “a teacher may come across when trying to effectively teach a diverse learner.”

In the weeks between the second response paper and the third, Rose conducted surveys with high school students and discovered that the majority of responses indicated “students feel they are less motivated in classes that the teachers don’t relate with them and don’t make the classroom enjoyable.” She set out to find educational theories/theorists that could help her make sense of her research, and she discovered some of John Dewey’s readings. Research into some of Dewey’s educational theories gave her evidence to support her assertions that the “Joy Factor” is critical in establishing a teaching and learning environment that best supports all students. Her research during these weeks was reflected in her third response paper, in which she had to complete the sentences, “All learners learn best when…” and “All teachers teach best when…”

Rose opened her response with the claim that “in order to be the best possible teacher, a teacher must center their [sic] teaching techniques and curriculum around the child’s needs…[because] teachers teach best when their students are engaged and enjoying class.” She went on to cite Dewey’s work around creating an interactive environment for students. Since her research around the ill-structured problem scenario focused on students’ needs and had not yet explored the ways teachers could be supported in their efforts to establish and maintain an

environment around principles of multicultural education, Rose's reflections on how/when teachers teach best ultimately revert back to a discussion of supporting students' needs. She rounded out her discussion of teachers by stating, "I strongly agree with John Dewey's theories on education and believe the best teachers are those that follow his ideas of centering their approach around the children and helping students enjoy learning by applying student information and interests to the curriculum planning." With this statement, it is clear she was reflecting on what makes the best teacher (for students) and not the conditions in which a teacher could be his/her best.

To complete the sentence, "All students learn best when...", Rose responded by stating, "Students learn best when they have the desire to learn. Without this desire students will not enjoy school or learning." She supported her assertion by referring to research she conducted in previous weeks around the ill-structured problem, observing an elective, high school art class, explaining that the students who were excited to come to class were the students who were most engaged with the material. She posited that it is the teacher's responsibility to encourage and motivate students because not all students are able to motivate themselves.

The final response paper came at the end of the research period for the ill-structured problem scenario, just days before the final presentations to the board. In the weeks leading up to the final response paper, Rose reported reading *The Secret to Better Schools* by Deborah Lukovich, a book discussing methods for improving urban education, and *Teaching with Joy*, a book providing information about the role environment plays in creating the Joy Factor as well as methods for how teachers can develop the Joy Factor in their classroom experiences. Rose located these resources on her own, after conducting some searches using Ortler's library

databases. In her final response paper, Rose was asked to respond to what she thought was the purpose of education and what she saw as her role in education.

In response to the prompts, Rose wrote, “The purpose of education is not only to educate the student on the required curriculum, but [sic] to help students realize how those lessons can benefit them and their futures.” She reiterated ideas discussed in previous response papers around the individuality of students, meeting students’ diverse needs, and the importance of fostering student motivation and engagement. To close the response paper, Rose reflected on how she situates herself as a teacher:

It’s my dream to become the person that inspires students, the person that sparks imagination, encourages curiosity and creativity and gives students hope to brighten and further their futures. In the grand scheme of the education world, I hope to be the teacher that gives the classroom back to the students. Their education is theirs and they deserve a say in how they want to learn. I want to be the change in a school that reintroduces the joy factor back into the classroom. Too many teachers have lost the joy in their classroom, which is resulting in a large number of students not appreciating their educations. I’m anxious to get involved in helping students learn not only what is required now, but [sic] to help students build off of that knowledge in a way they will enjoy and apply it to real life situations.

### **Conclusions and Implications**

Rose’s thinking about multicultural education, as evidenced by the ways she wrote about it in her four response papers, did not *change* drastically by the end of the semester. In truth, had I not used a problem-based learning approach in ED 100, Rose likely would have had *different*

ways of talking about multicultural education by the end of the semester than she did at the start to the semester.

Based on my previous experiences teaching the course using a more traditional approach, students would attempt to explain what they thought was meant by multicultural education at the start of the course, producing musings similar to Rose's first response paper. Then, the semester would be used to assign students readings from the course textbook on multicultural education and to invite guest speakers to come in and highlight aspects of the course textbook. At the end of the semester, the students would often give a *different* explanation of multicultural education – one that included the characteristics from the textbook, from the guest speakers, and from what I said in class. The responses were often almost identical. They were “accurate” because they gave back to me what I offered to them, and they were *different* from the ones given at the start of the semester. But, even though the responses were *different*, there was no solid evidence that there was a *change* in their convictions, beliefs or values. The responses simply evidenced regurgitation, not a reflection of a commitment to or change in their values, or of the pre-service teacher's immersing sense of self-as-teacher.

ED 100 is the first course in a multi-year sequence of Education courses designed to prepare pre-service teachers for student teaching and licensure. While it might be more efficient in this course to explicitly direct students to the conventional or accepted sources of information about multicultural education, there were benefits of allowing pre-service teachers at this very early stage of their development the opportunity to “wander.” The students might not end up together in the exact same space, but they will have traversed similar ground, just on different paths. These paths of their choosing ultimately reflect the experiences they bring with them as

socially constructed individuals, and what they discover along their individual paths will serve to change their thinking or solidify their convictions. Noel (2008) contends,

For individuals who have not incorporated the issues of multicultural education into their own identities, being told about the need for multicultural education does not help them internalize the importance of the issues in the field. [They] do not necessarily internalize the importance of multicultural education when [they] do not actively...make multicultural concepts a part of their own identity. (p. 1)

For Rose, there was much terrain to cover when it comes to learning about multicultural education – its purposes, its foundations, its expectations of teachers, its benefits to students – and she still has a long journey in building her teacher identity. She did not leave ED 100 knowing all there is to know about multicultural education. Within a more traditional approach to the curriculum, she would not have left under those conditions, either. The difference, as evidenced by her four response papers, is that she left ED 100 with firm convictions about what she wants to do as a (multicultural) educator and why it is important to her. She did not yet have all of the language or a complete sense of the challenges, structures, or implications, but she was building a sense of how multicultural education fits with her sense of self at the beginning of her development as a teacher. She might not have had the exact same understandings as her peers, but she had a deeper understanding of the content in terms of how she relates to it as a developing teacher. The professors in the next courses have the option to implement a more traditional approach to gather the students back together before they might have a chance to wander down divergent paths again further along in their coursework.

The research in which Rose engaged as she worked with her group members to analyze and find solutions to the problem scenario centered on developing and maintaining the “Joy

Factor” in the classroom. Central to the Joy Factor, based on Rose’s reflections, is creating an environment around students’ needs, interests and learning styles. Rose often wrote in her response papers about the importance of teachers learning about their students so that teachers can offer students learning experiences and choice in assessments, tailored to the ways they enjoy learning. Her responses aligned with Noel’s (2008) discussion of learning styles and intelligences as another characteristic of multicultural education:

Although schools traditionally have required students to learn in a very structured environment, with patterns of participation and ways of thinking already preestablished, not all students fit into that traditional teaching-learning setting. Some learn better with different types of settings and methods...[Teachers] need to look at student differences in learning, in cultural background, and in race, gender, and income, not as problems to overcome, but rather as positive resources. (p. 126)

Noel (2008) and Gorski et al. (2013) advocate teachers adopt a “difference orientation” when teaching diverse students. At the core of this orientation is the belief that “*I could teach these students better if I just know more about them*” (Noel, 2008, pp. 128-129), a sentiment Rose echoed throughout her four response papers. As Noel (2008) explains, “this orientation requires the teacher to take action – not to ‘fix’ the deficient child or family, but rather to examine his or her own teaching practices to determine how to teach in a way that includes the experiences of all learners” (p. 129). Critics to the learning styles approach (Gregorc, 1979; Ladson-Billings, 1992) contend that more important than implementing changes to curriculum around students’ learning styles is the teacher’s awareness of his/her own teaching style in order to make a concerted effort to teach beyond his/her preferences. Rose’s perception of multicultural

education and its relationship to the Joy Factor in the classroom does not yet include these alternate viewpoints.

In relation to Bakhtin's (1990) "excess of seeing," perception is unique to and limited by the individual's horizon and environment, and "cognition constructs a unitary and universally valid world, a world independent in every respect from that concrete and unique position which is occupied by this or that individual" (p. 23). Rose uniquely perceived multicultural education from where and how she was situated as a socially constructed individual. She explored her perceptions in the four response papers and strengthened her convictions in who she wants to be as a multicultural educator. Engagement in the problem-based learning curriculum allowed her the opportunity to wander and contemplate her unique position. However, she was limited by her horizons and environment. Forever wandering would be detrimental to her overall development as a teacher. The wandering she does at the very start of her development, however, gave her the chance to understand her situated position before she explores the "consummating environment" future professors can create for her to "fill in" her horizon (Bakhtin, 1990, p. 25). She will eventually need more pointed guidance from her professors because as Bakhtin asserts, "the aesthetic *whole* is not something co-experienced, but something actively produced, both by the author and by the contemplator" (1990, p. 67). At this very early point in her development, though, it was critical that Rose develop her situated awareness prior to working with professors to co-produce her aesthetic whole.

As teacher educators evaluate the benefits of a problem-based learning curriculum, they have to give consideration to pre-service teachers' trajectory of development. They need to consider at what points it is valuable to allow the novice to find authority in his/her own experiences, questions, and chosen sources of knowledge. Pre-service teachers can deepen their

self-awareness and can build a sense of self-as-teacher more deeply in a problem-based learning curriculum, but they might not cover as much ground as they could in a more traditionally directed approach. Before embracing or dismissing problem-based learning as a way to develop pre-service teachers, teacher educators need to examine from where pre-service teachers are coming, where they are going next, and where they ultimately need to end up.

## Conclusion

I did not go into this research particularly attuned to factors around pre-service teachers' stages of development. While I was cognizant of the fact that I was implementing a problem-based learning curriculum into the first required Education course in the sequence of courses designed for Education majors and minors, I did not purposefully set out with a goal of studying the impact on candidates who are very early in their development as teachers. The base of literature I reviewed prior to implementing the problem-based learning curriculum in ED 100 did not differentiate the needs of pre-service teachers in their various stages of development throughout their time in a teacher education program. While it was clear that pre-service teachers have different needs as they prepare for licensure, as opposed to the needs of teachers who are already serving in the field, I had not discovered a base of literature discussing ways to approach teacher education for candidates in the beginning stages, the middle stages, or the final stages of preparation. However, after collecting and analyzing my data, I became aware of the significance of my implementing a problem-based learning curriculum at such an early stage of the pre-service teachers' development.

After reviewing my data and my analyses of the data, I realized the importance of clarifying for my readers the expectations I had *because* the pre-service teachers were in their first Education course. I made sense of the data through the lens of the participants' level of development; I discussed how the freedom of the problem-based approach was beneficial *because* of where the pre-service teachers were coming from and of where they were heading in their program. I began to notice connections between my discussion of the data and Perry's (1999) scheme of intellectual and ethical development in the college years.

To provide a brief summary, Perry's scheme, first published in 1970, was the result of his fifteen-year study of Harvard undergraduates, examining their cognitive development. His work provides a nine-stage framework that outlines the steps undergraduates take from a simplistic, categorical view of knowledge to a complex, contextual view. In general, he posited that most undergraduates, in their first year, are in a stage of Dualism on their way to Multiplicity. In the Dualism stage, students believe that professors (the Authorities) have the right answers, and they, as students, must receive knowledge from them. There is a break from the dichotomous views of right and wrong, authority and novice as students move into the Multiplicity stage, marked by an awareness of diversity and that much knowledge is still unknown. The focus in this stage is around the process of finding information and on self-processing and ownership of ideas.

My research at Ortler College can be informed by Perry's "scheme" in that a benefit of implementing a problem-based learning curriculum very early in pre-service teachers' development might serve as a way to move students out of the Dualism stage and onto the more generative Multiplicity stage. Additionally, when evaluating the goals of this first Education course and the students' experiences in it, Perry's scheme informed my thinking about what is most important – asking questions or probing deeply for answers?

The goal for my dissertation was to explore the question: How does engaging pre-service teachers in a problem-based learning curriculum impact how they build a sense of self-as-teacher and what they understand as their role within multicultural education? My research at Ortler College demonstrated that, ultimately, pre-service teachers have opportunities to build a sense of self-as-teacher and understand their role(s) within multicultural education through engagement in a problem-based learning curriculum. However, it was important to understand the correlation

between the impact and the pre-service teachers' development. This conclusion is driven by the work I represented in each of the three articles in this dissertation.

The first article, "The Potential for Problem-Based Learning in Pre-Service Teacher Development," explored the literature around developing pre-service teachers, how current approaches tend to perpetuate systems of teacher-control and student-mimicry, what needs to change, and what potential problem-based learning holds. A review of the literature around control, management and mimicry relates to Perry's (1999) scheme of undergraduates' intellectual development. When approached with a focus on pre-service teachers' early stages of development, the inherent trust students place in the authority of professors and their tendency and willingness to accept professors' lectures, presentations and readings as Truth, there is a clear alignment with Perry's stage of Dualism. Early students allow themselves to be controlled and managed, and choose to mimic what they hear and read because they are situated in an early stage of intellectual development.

The second article, "Problem-Based Learning, Divergent Thinking and Teacher Identity," took a look at four pre-service teachers' reflections and questions throughout the problem-based learning process in their first Education course. What I found was that a problem-based learning curriculum gave the pre-service teachers a chance to independently discover many of the influences on and complexities of the field of education. The participant responses showed that they understood *that* the space is complex, but they often did not dig deeply into many of the complexities they uncovered. The number and types of questions might have been overwhelming, but they showed evidence of being situated in Perry's Multiplicity stage as they engaged in self-processing and explored the processes of problem-based learning.

The third article, “Problem-Based Learning, Multicultural Education and Self-Awareness,” focused on one participant’s narrative responses to bi-weekly response paper prompts and questions. The response paper portion of the problem-based learning process provided more guidance than any other portion of the process. From the pre-service teacher’s responses there was a clear sense of who she wanted to be as a teacher. There was evidence of her convictions building throughout the response papers, and in the end, she was able to passionately state what she wanted to do and who she wanted to be. Even though the research showed that there was much more for her to learn about multicultural education (a fact I believe the participant realized, too), her ownership over the ideas in the response papers situated her in Perry’s Multiplicity stage. A question remains: If she experienced a more traditional and controlled approach to this first Education course, would she have been in this stage at this point in her development?

### **Implications**

While Perry’s (1999) scheme of undergraduate intellectual development is helpful in thinking about the participants’ view of knowledge, there is still much to consider around the impact of a problem-based learning curriculum on pre-service teachers’ development, particularly in the ways they build a sense of self-as-teacher and in how they construct their role in multicultural education. There are implications beyond this research study, particularly in the ways teacher educators can structure the implementation of the problem-based learning curriculum to best scaffold pre-service teachers’ independence.

### **Fostering Divergent Thinking**

While a problem-based learning curriculum can foster in its participants divergent thinking about a problem, simply being immersed in a problem-based learning curriculum does

not fully provide the skills or ability to think divergently. Without having learned how to think divergently, it is easy to get lost in the questions and possibilities. There is a fine line between guiding problem-based learning participants and leading them down specific paths, particularly when the participants are mostly in a developmental stage that speaks to their viewing professors as the authority and source of knowledge for them to acquire (Perry, 1999). At what point, then, does guidance become control? How does a teacher foster divergent thinking in students?

There is potential to use problem-based learning to teach divergent thinking, but the implementation of it would need to be modified. With a modified implementation, professors could build in more explicit opportunities for students to talk about their experiences with the process of problem-based learning and with the development of their divergent thinking along the way. Professors could be more explicit with the types of questions students might consider asking and those they might consider avoiding. Because the focus would be on teaching a skill (divergent thinking), there would be less pressure around a professor questioning whether the guidance s/he is giving crosses the line into managing what the students should or could know about the discipline. In that way, the goal of the problem-based learning situation would have to be simply to teach about and explore divergent thinking, rather than to also expect that the participants meet discipline-specific goals as well. They would engage in a problem scenario to begin to learn to think divergently, not to begin to think about multicultural education, for instance. After at least beginning to develop the necessary skills to thoughtfully probe questions, students would be better equipped to engage in a problem-based learning scenario around a significant issue in their discipline.

## **Feedback and Criteria**

The role of feedback and criteria is important to consider in any learning environment, especially at Ortler College where there is a consistent and heavy emphasis on both. Criteria serve as a way to communicate with students, and through this communication, to guide them by being transparent and explicit about expectations. Criteria also lay a foundation for providing targeted and equitable feedback to all students.

Having more explicit criteria around proficient participation in a problem-based learning curriculum might have provided more guidance to the students who were experiencing this type of learning for the first time. Students received criteria for the final presentation, but providing them criteria for the process of arriving at the final presentation would have provided more transparency for students around my expectations for them in their work grappling with the problem scenario, posing questions, setting goals, synthesizing information, and reflecting on their process.

The students and I would have also benefitted from criteria around the questions they posed throughout the process. As my second article illustrated, the participants were asking a flurry of questions, not always explicitly connected to the problem scenario. They asked new questions before they had fully probed the previous ones, sometimes asking questions they did not bother to research at all. They often did not ask sub-questions to show their growing understanding of a larger, more overarching question; instead, they posed entirely new questions that, if explored, would take them miles from their original question(s). Having criteria centered on question formation and follow-up could better guide students through their question-formation processes.

Providing targeted feedback with respect to established criteria would serve as another way of helping to guide students through the problem-based learning process. However, the use and purpose of the feedback in the problem-based learning process presents a challenge to the professor facilitating the process. Too much feedback during the process might take away the students' autonomy and discourage the independence and originality of thought; too little feedback, however, could leave the students feeling abandoned and floundering. Balancing the amount and types of feedback becomes especially challenging when working with undergraduates in Perry's (1999) Dualism stage. If the students see the professor as *the* source of authority, the professor must be especially careful in what s/he provides as feedback so as not to give the impression that it is the *Truth* or the *only* knowledge that counts.

### **Time**

A problem-based learning process takes time. Learning how to participate in a problem-based learning process takes time. Learning about a concept, issue, or discipline while engaged in a problem-based learning scenario takes time. Like a problem-based learning process, developing a teacher identity takes time. Developing professional, humanizing dispositions takes time. None of the above-mentioned processes should be or can be rushed. Taking the time needed for development to occur within or from a problem-based learning process requires a shift in thinking about teacher development that might not be comfortable for all teacher educators. Relinquishing the certainty of the paths pre-service teachers take at various points in their development can be difficult; it is important, however, to note that problem-based learning does not have to (and should not) replace the existing approaches used in every teacher education course in every teacher education program. Relinquishing the control at select points, then, might be more feasible for some to consider.

With respect to time, it is also important to note that significant growth and development might not be apparent immediately or by the end of a course. For example, the professional, humanizing dispositions about which I discussed in the first and second articles might take the entire program for a candidate to develop. One might not see the complete development until the teacher has been teaching full time for a few years. Not seeing significant growth at the end of one course does not necessarily make the approach faulty. It is more important to consider what the development looks like; for instance, what performances would illustrate growth in developing a particular disposition? Do teacher educators consider it growth if teacher candidates can only talk about it, or if they can only echo what they heard the professor say? It takes less time to foster mimicry, but does that “count” as development? Is there benefit in allowing more time for independent explorations at carefully timed points in a pre-service teacher’s development?

### **Impact on Current Practice**

I taught ED 100 in the spring semester of the 2013-2014 academic year, again implementing a problem-based learning curriculum. However, I made adjustments to the structure and implementation of the problem-based learning process, and I have plans to make additional changes when the course runs again in the fall semester.

The instructional services faculty members who facilitate the first one-third of the course around preparation for the PPST were willing to facilitate a smaller problem-based learning process around the PPST/test preparation material. This smaller unit was modified to allow for more teacher guidance. It gave students a sampling of what problem-based learning is before they engaged in the larger, more encompassing one around multicultural education; however, it still carried the goal of students learning about discipline-specific content. As stated earlier,

students would benefit from engaging in a modified problem-based learning process detached from discipline-specific content in order to learn how to better function within the problem-based learning space.

In the multicultural education problem-based scenario, I organized more focused class sessions. While students still had the majority of class time to work with their group members in thinking about questions, seeking sources of information, synthesizing information, setting goals and reflecting, I began each class session by asking students to explore a particular source of information as they thought about their questions and growing bank of information. I also invited guests to the class sessions to serve as resources, available only to answer questions from the groups and not to present information. This semester, all students were asked to find a school where they could conduct a field observation or interview, select a book that all group members would read, use databases available through the Ortler College library website, connect with a faculty member in any teacher preparation program and/or connect with a member of leadership in any community organization, find and explore at least one educational theorist, and bring in at least one piece of opposition to their stance. Setting these more explicit expectations is a way of guiding students to balance the information they use to make sense of the problem scenario.

This semester, I have also required that groups use Google Docs or the discussion board feature on our educational management system at Ortler College to have virtual discussions and to record notes during any group meetings. Having students use these programs allows me access into more of their thinking and more of the question formation and information synthesis stages. It also allows me the opportunity to more frequently provide guidance through questioning and redirecting, if necessary.

In addition to considering implementing a practice problem-based learning process in the fall semester of the 2014-15 school year, I am considering ways to orient the pre-service teachers around the constructs and language of the discipline, recognizing the challenges of expecting students to evaluate and challenge structures and approaches they do not yet know exist. At the same time, I remain cognizant of their overall development in how they view knowledge and sources of knowledge. With that in mind, I hope to begin the semester by providing the ED 100 students some readings about multicultural education, to orient them to some of the concepts, people, and terminology in the field. After engaging in a short practice problem-based scenario to orient them to the process, students would then explore a problem scenario designed around a problem emerging from the literature they explored at the start of the semester. They would have the opportunity to problematize the readings I offered them, rather than accept the readings as the *Truth* because they came from their professor.

I have also begun having conversations with colleagues in the School of Education at Ortler College around at what other points in the program sequence it might be appropriate or beneficial to offer more problem-based learning experiences.

### **Future Research**

The process of implementing a problem-based learning approach and studying its impact on teachers' building a sense of self-as-teacher and conceptualizing their role(s) as multicultural teachers has pushed my thinking about teacher preparation and has resulted in significant changes to the way I approach ED 100. This research, though, also raises questions for future research.

*1. How should learning experiences vary along different points of pre-service teachers' development?*

It would be unrealistic to create a map of what pre-service teachers should universally learn at various stages of the teacher preparation program. However, more research could be done around how the teaching and learning experiences vary between the early stages, the middle stages and the final stages of pre-service teachers' development. At what points along pre-service teachers' development would it be appropriate to give them more voice in determining what and how the material is learned? At what points might asking questions be more important than having answers?

*2. What is the role of a teacher preparation program within a more expansive liberal arts program?*

Learning to think divergently and developing self-awareness through reflection are not skills limited to teachers. Undergraduates are likely engaging in experiences that foster these skills in their liberal arts / general education courses prior to their work in the Education sequence of courses. In what ways could teacher educators study how and where pre-service teachers are introduced to work around these skills prior to engaging in Education coursework? How might teacher educators work with their colleagues to be more intentional about interdisciplinary work in developing the skills and abilities that are useful in pursuing any degree?

*3. How can teacher educators help pre-service teachers become aware of their own dispositions?*

There is research around what professional dispositions are critical for teachers, and there is research that addresses ways to develop professional dispositions. More research could be

done around how to raise pre-service teachers' awareness of their own developing dispositions.

How explicit should educators be about the experiences they create with the objective of developing dispositions? If a pre-service teacher is not aware of his/her own developing dispositions, to what extent are they "genuine?"

*4. How might fostering pre-service teachers' divergent thinking and self-awareness prepare them to work within the frameworks of their PreK-12 school? How do these skills benefit them as they negotiate the complex environments influenced by government, communities, families, the media, etc.?*

Research, such as some of the studies referenced in this dissertation, identifies the importance of developing pre-service teachers' divergent thinking and self-awareness. However, little research exists that illustrates some of the specific ways these skills benefit teachers once they are licensed and teaching in PreK-12 schools. Do the skills need to be fully developed before teaching in the PreK-12 context, or might more experience in the field be necessary to the full development? What structures and supports might be in place for maintaining divergent thinking and self-awareness in PreK-12 contexts?

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