Developing Teachers
Who Are Reflective Practitioners:
A Complex Process

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Introduction

Teachers everywhere are being held accountable for their professional actions through the test-driven curricula sweeping the nation. While teachers are often stripped of their professional voice and given little freedom to make pedagogical decisions, professional accountability demands that they be guided to develop their critical thinking so they may reflect on their practice and make decisions based on sound reasoning.

While required to use specific mandated materials and to prepare their students for standardized achievement tests, they are also asked to rethink their practices and to keep up with the latest knowledge of how children learn. New knowledge of learning and cognition call for higher academic standards, and important discoveries about learning as a socioconstructive process place new demands on all educators as they reconceptualize teaching as a profession (Lieberman & Miller, 2000). Part of this reconceptualization includes the development of goals and standards developed by teacher educators and policy makers. The National Council for the Accreditation of Teacher Education (NCATE, 2002) makes it clear that promotion of reflective practice is an important component of teacher education programs.

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These standards, then, give teacher educators a guide as they work with future teachers. However, developing a reflective teacher is not an easy task. Teacher educators often try to promote reflectivity through assignments specially designed for this purpose such as reflective journals and autobiographical narratives. Although these types of assignments may promote reflectivity during the pre-service phase, educators often find that many student teachers struggle to engage in reflection (Calderhead, 1987; Galvez-Martin, 1997). Based on empirical studies, LaBoskey (1995, p. 30) explains that difficulties may arise because the process requires both a cognitive ability and conducive beliefs, values, attitudes and emotions, which novices may lack. Thus many of the student teachers' writings about their experiences are superficial in nature and can only be categorized as non-reflective.

Although the ability to reflect is linked to logical reasoning, epistemological world views (Schraw & Olafson, 2002) have also been linked to the capacity to engage in reflective thought. Epistemological world views refer to an individual's system of values and beliefs about the nature and acquisition of knowledge. In the teacher, this system of beliefs, often called epistemic stances, defines the attitudes towards teaching. The connection between reflective thinking and epistemology dates back to Dewey (1933). An analysis of Dewey's paradigm of reflective thought reveals that three attitudes are required in the process of reflective thinking: open-mindedness, responsibility, and wholeheartedness.

Of the three attitudes, open-mindedness is the most significant in examining the relationship between reflectivity and epistemology. It refers to the ability to remain open to multiple, alternative possibilities. This means that the open-minded teacher continuously questions routines and practices, their validity and their efficacy. In other words, in order to begin reflection, the individual must have certain values and beliefs about learning that will lead to reflection. Hence, the reflective teacher does not believe in one single truth, or in one right way to teach. Therefore, some specific beliefs about learning, or epistemic stances, promote reflective thought, while others may hinder it. To better understand the development of reflectivity it is necessary to examine epistemic stances of pre-service teachers.

Theoretical Background

To examine the relationship between epistemic stances and reflective thinking, I made use of a set of theories and instruments that allowed for the analysis of these constructs. The participants' epistemic stances were examined through the use of instruments developed by Baxter-

Magolda (1992) while the qualitative aspects of reflective thinking were examined through the use of a theoretical framework developed by Mezirow (1991), an adult learning theorist.

Epistemic Stances

Baxter-Magolda's (1992) work suggests an intimate connection between epistemic stances, which she calls ways of knowing, and reflection. Her longitudinal study of college students over a five-year period shows the developmental nature of these processes since the quality of reflection changes as the student matures and new epistemic stances emerge. Her grounded theory served as the framework for categorically examining the epistemology of the participants within the study presented here. Two instruments developed in her study were the Measurement of Epistemological Reflection (MER) questionnaire and the interview protocol. These instruments examine college students' ways of knowing and patterns of reasoning by asking about their process in choosing a particular career, their views about the nature of knowledge, their individual styles of learning and preferred modes of instruction, how they relate to peers and instructors in their learning process and how they evaluate knowledge.

Baxter-Magolda (1992) categorizes the development of epistemic stances into four stages, which she calls ways of knowing: *absolute knowing, transitional knowing, independent knowing and contextual knowing* (See Table 1). These range from the most simple, dualistic view of knowledge to the most complex view of the world where knowledge is context based. The person who is an absolute knower, the first category in the taxonomy, seeks to learn by receiving knowledge of what is right from authorities (teachers or experts). At the other end of the spectrum lies the contextual knower, a highly analytical person who judges all information on the basis of evidence within context. According to Baxter-Magolda (2001), not all individuals reach this level within the college years, and some may never reach it at all. Within these two extremes are the ways of knowing called transitional and independent knowing representing an evolution in epistemic stances, each progressing from a simplistic way of seeing knowledge as dualistic to one that is analytical and evaluative, based on criteria that are context relevant. Contextual knowers are highly critical in the pursuit of understanding and examine not only the data but also their own and others' perceptions and values.

The first three ways of knowing are further subdivided into patterns of reasoning based on how the learner interacts with others. The patterns on the left of the chart represent an isolationist approach (mastery, impersonal and individual) and the ones on the right side of the chart

Table 1. Ways of Knowing and Patterns of reasoning (Baxter-Magolda, 1992).

Ways of Knowing	Patterns of Reasoning	
Absolute Knowing Knowledge is either correct or incorrect. Correct knowledge obtained from authority.	Mastery Peers debate and quiz each other for mastery.	Receiving Peers talk to create a relaxed atmosphere.
Transitional Knowing Some knowledge is correct; other types of knowledge can never be discovered. Learner should understand rather than memorize facts. Not all knowledge comes from authority.	Impersonal Learner exchanges views with peers and express their opinions.	Interpersonal Learners collect ideas from others who provide exposure to new ideas.
Independent Knowing Most knowledge is uncertain so learner thinks independently. Values knowledge that does not come from authority.	Individual Learners focus primarily in thinking independently; exchange with others is of secondary importance, though appreciated.	Interindividual Learners place equal value on hearing others' perspectives and thinking for themselves.
Contextual Knowing	Peers enhance learning via quality contributions. Learners exchange and compare perspectives, then integrate and apply knowledge.	

represent an interactive approach (receiving, interpersonal and interindividual). As the knower progresses from absolute to contextual knowing there is a movement towards achieving more balance between isolation and interaction. At the last level in the taxonomy, individuals can chose between either pattern as they analyze and evaluate knowledge. Table 1 describes the characteristics inherent in each way of knowing and pattern of reasoning.

The implication in Baxter-Magolda's study is that ways of knowing may impact the ability to reflect. The assumption is that more sophisticated types of reflection can be exhibited by individuals in contextual knowing because the knower views the world with an open mind and an attitude that truth is context bound. There are multiple solutions to problems therefore deep analysis and reflective thought are the ways to find the possible solutions. Conversely, on the other end of the spectrum, the absolute knower is less likely to reflect deeply because the act of thinking is a process of finding and accepting the right course of action

according to some authority. This way of thinking does not allow for any deep analysis or examination of multiple perspectives

Taxonomy of Reflective Thought

To examine reflective thinking, researchers and theorists have developed taxonomies to explain qualitative aspects of reflection and have identified critical reflection as the deepest level of reflectivity. For teachers, critical reflection is the type of reflective thought most closely associated with Dewey's definition, explained earlier, and involves reflections on the teaching practices as they relate to moral and ethical issues in society. Although difficult to measure, these typologies help to identify specific characteristics that determine the level, or quality of reflectivity. This article focuses on the use of a taxonomy developed by Mezirow (1991) as part of his transformational learning theory.

The taxonomy developed by Mezirow (1991) categorizes thinking into levels, which explain the different qualitative aspects of the process This framework for coding reflection includes three levels of depth of thought: *non-reflective action*, *reflective action* and *premise reflection*, which is the equivalent of critical reflection as defined by other theorists in reflective practice (See Table 2).

The first two categories of thought are further subdivided. Non-reflective actions can be: *habitual action, thoughtful action, or introspection*. These constitute very superficial levels of non-reflective thought such as routine actions that are performed automatically, thoughts about

Table 2. Taxonomy of Reflective Thought According to Mezirow (1991).

Non Reflective Action	*Habitual Action*. Learned action, performed automatically with little conscious thought.
	Thoughtful Action. Uses prior knowledge without appraising it.
	Introspection. Awareness of the feelings associated with learned actions.
Reflective Action	*Content Reflection*. Reflection on perceptions, thoughts, feelings or actions. (What)
	Process reflection. Reflection on the processes of perceiving, thinking, feeling or acting. (How)
	Content & Process Reflection. Combination of both content and process reflections.
Premise Reflection. Awareness of reasons behind one's perceptions, thoughts, feelings and actions. (Why)	

which mandated methods or instructional techniques to use, or introspective feelings about teaching actions. It does not include the careful consideration of reasons for acting in specific ways. The next category, reflective action is divided into three subcategories: *content reflection, process reflection*, and *content and process reflection* (a combination of content and process reflection).

The final category, *premise reflection*, is what others call critical reflection. It represents the highest level of reflective thought involving an analysis of the premises and assumptions inherent in the personal perspectives of the one who reflects. In other words, critical reflection includes, not only questioning how to teach, but also why specific ways of thinking and questioning are part of the reflective process and not others. Transformational learning theory (Mezirow, 1991), has contributed to the current understanding of reflective thought, in particular critical reflection. It refers to a learning process that results in the transformation of beliefs, attitudes, assumptions, and the perceptual and conceptual codes that form and limit the way we think and learn. Critical reflection is a crucial aspect of reflective practice because teaching is a complex activity; and solutions to teaching problems are often not found because practitioners fail to examine their own perceptions, or premises. Although Mezirow views critical reflection, as a way to transform the individual's way of knowing, this study examines how certain epistemic stances, and in turn certain ways of knowing, may prevent pre-service teachers from reaching this desired level of reflection.

Methods

This multiple case study involved the collection of data from four student teachers in their last semester of an undergraduate teacher preparation program for elementary grades. However, to illustrate the intricacies of reflective thought development, this article focuses on two participants who exhibited ways of knowing that are adjacent in the Baxter-Magolda's framework (1992) and represent a natural progression through maturation.

None of the four participants exhibited epistemic stances that lay at either end of the spectrum presented by Baxter-Magolda (1992). This means that no one viewed knowledge as being either right or wrong as in absolute knowing. Nor were there any participants who exhibited the complex level of contextual knowing. The two cases presented here were chosen to illustrate the development of reflective thought through epistemic stances. One case represents the highest level of complexity exhibited in the study in terms of epistemic stance and reflectivity. The

other serves as a comparison and illustrates the process of development of ways of knowing and its impact on the level of reflectivity.

The participants were adult learners between the ages of 28 and 35 who were instructional paraprofessionals. Using paraprofessionals helped to clarify some of the current assumptions about reflectivity. Some researchers have associated deeper levels of reflective thinking with experience in the classroom (Galvez-Martin, 1997; Galvez-Martin, Bowman, & Morrison, 1998), which they call knowledge of teaching. Thus, the assumption is that pre-service teachers are not highly reflective because they lack knowledge of teaching. Since the participants in this study were practitioners in the classroom, they possessed practical knowledge of the problems and issues in the classroom, which is not typical of the traditional pre-service teacher.

The participants in this small teacher education program were chosen because they were the only students who fulfilled the criteria for selection, which meant they were enrolled in the first of two student teaching semesters and were currently working in the classroom assisting teachers. This article focuses on two questions examined by the study:

1. What levels of reflection do preservice teachers who are instructional paraprofessionals exhibit in reflective journals?

2. How do the epistemological beliefs of preservice teachers who are instructional paraprofessionals relate to their level and quality of reflection as exhibited in reflective journals?

The full research included the use of a variety of methods to collect data and utilized triangulation in the analysis to maximize construct validity. This article focuses on three sources of data, an interview protocol and the MER questionnaire, both developed by Baxter-Magolda (1992), and a set of 15 weekly reflective journals, which were part of the normal course work associated with student teaching.

Since the study was founded on the assumption that knowledge is socially constructed, it examined the participants within their sociocultural and educational contexts. The interview protocol and MER questionnaire were analyzed for ways of knowing and patterns of reasoning according to specifications developed by the author of the instruments (for a full explanation of the instruments and analysis see Baxter-Magolda, 1992). The reflective journals were coded for evidence of reflective thinking according to the taxonomy developed by Mezirow (1991).

At the beginning of the semester students were given instructions to write weekly reflective journals for a total of 15 weeks. In each journal, they were asked to focus on one lesson they taught, or observed being

taught. They were also asked to analyze the most important aspects of the lesson, evaluate it and discuss possible alternatives. Each lesson presented in the journals was coded according to Mezirow's taxonomy of reflectivity (1991). Feedback on these assignments was limited to pedagogical aspects of the experience and not on levels of reflectivity.

As a participant observer, I was the university supervisor for the participants. Thus, I was able to understand aspects of the setting that may have influenced their responses from an inside perspective (Yin, 1994, p. 88). The effects of power relations between student and teacher were minimized by the humanistic dialogical nature of the educational methods used in the setting (Flecha, 2000). Furthermore, steps were taken to minimize the effect of power relations by collecting data from naturally occurring events, and withholding analysis of data until after the term's coursework was completed and evaluated.

As a qualitative study, the analysis included rich, detailed descriptions of the responses of the participants within the natural context of the setting and used the triangulation of data from multiple sources to fully explain conclusions (Merriam, 1998). In particular, allowing the participants to review the data was a significant way to insure that the interpretation was grounded in the context and persons whose development was being assessed (Baxter-Magolda, 1992). The completion of the MER questionnaire and the interview protocol were spaced three weeks apart, then they were coded according to ways of knowing and patterns of reasoning discussed above.

Although beyond the scope of this article, it is important to note that the findings were examined against the data from additional sources which included personal narratives and audio taped classroom discussions. This multi-layered process provided a rich and detailed view of the reflective thinking process in relation to the participants' epistemic stances and development. Sociocultural factors that impact the development of reflective thinking became evident and a more complete conceptual model of the process emerged from the inquiry.

Results and Discussion

The Case of Elena

Elena is a 23-year-old woman born in New York of Puerto Rican parents. She spent part of her childhood in Puerto Rico and went back to New York when she was 10 years old. She had been a teacher's assistant in a kindergarten classroom within a Christian parochial school for one year, at the time of the study.

Based on the analysis of interview protocol and the MER question-

naire, Elena's responses showed that she uses the transitional approach to knowing favoring the interpersonal pattern of reasoning. As a learner, she focuses on understanding new knowledge rather than memorizing it as expressed in this excerpt from the interview:

> The key to doing well in college courses is to do research on the work taught and go around asking teachers to give you their opinion so that you can investigate and be on top of the class. You also need to see and read the news to know what is going on around you that deals with school.

As a transitional knower, she views knowledge as both certain and uncertain. Thus, some knowledge is based on facts; being either right or wrong, while others may have a more ambiguous nature. Uncertain knowledge is difficult to discern and must be judged by the individual since it is not necessarily the possession of an authority. The learner must exercise judgment to make decisions about what is right or wrong according to their own opinion. People who use the interpersonal pattern of reasoning are inclined to focus on the uncertain areas of knowledge. They concentrate on understanding knowledge by engaging in lively discussions with peers who in sharing experiences may clarify important issues. This is why they favor instructors who use classroom discussions as a method of instruction and who focus their discussions on practical application of concepts. As a learner, Elena focused on understanding new knowledge that is practical. This was evident in many instances. Here is an example taken from her response to the MER questionnaire where she expressed her liking for the methods course taught through a series of modules:

> By doing the modules you can implement what you learn into what you are doing at work. I like the fact that you learn from them because they are based on experiences and things that we see in schools and they enable us to be prepared.

In another statement made during the interview, Elena focused on understanding new knowledge rather than memorizing it.

Elena demonstrated the interpersonal pattern in transitional knowing which led her to seek understanding by collecting ideas from others as evidenced in this response to the interview:

> The method of instruction that has been most beneficial to me is when the professor explains in full detail and instructs the class with knowledge of how to teach it. What made it beneficial is that not only am I learning from my professor but I'm also learning from my classmates. For example, in an Anthropology class, we were talking about cultures and we were able to share the customs of our culture.

Although she valued the interaction with peers, the knowledge came from the professor and interaction with peers helped to clarify the lesson.

Elena submitted 15 journals. Her journals show evidence of content reflection 10 times, making this the level most frequently used. The highest level of reflective thinking was the combination of content-process reflection but it was reached only on two occasions. Therefore this participant's levels of reflective thinking most often remained in the lower range, but not so low to be considered non-reflective. Elena's reflective thinking was focused on the content of her experience, which were the actions taken by her or her supervising teacher to promote learning in the students. These included teaching specific skills, such as choosing the correct punctuation in declarative or interrogative sentences (journal 3), measuring items with a ruler (journal 6), matching two words according to initial sound (journal 7), following written directions (journal 8), writing words in the correct order to form a sentence (journal 10), telling time (journal 13), and recognizing differences between short and long vowels (journal 14). One way to foster understanding was to make learning fun and meaningful by connecting it to their own experiences as expressed in journal 9: "The students were very excited and they wanted to learn more. I was able to integrate reading with science. I allowed them to share their experiences, if any, with thunderstorms, volcanoes, earthquakes and tornados."

It should be noted that although Elena never reached the highest level of reflective thinking, that of premise reflection, but on one occasion, she engaged in the combination of content and process reflection which can be considered high. This is evident in journal 11 where Elena first discusses the content of the activity and what actions led to greater understanding. Like her other journal entries, she focused on teaching a skill (in this case phonemic awareness.) She broke the activity down into simple steps, and provided support as needed. This was the content of her reflective thought. The process was articulated in the end of the journal:

> We were observing how they (the students) answered these exercises. Most of them were taking their time in answering the questions, while others were just choosing the first answer without reading the questions or the sentences. By observing them doing this exercise, we were able to see who was following instructions and who was not. One way that I helped the students was by sitting down with them and reading them the sentence without telling them the answer.

When Elena analyzed her observations of student performance, she was able to make insightful conclusions about the success of the lesson. Her focus on how she observed the children at work is a process reflection

because she was reflecting on her process of observation and how it impacted her understanding of the children's learning process. It was an important way to evaluate learning in individual children.

In sum, the epistemology of this participant interacted with her reflective thinking process in that patterns of reasoning led her to think about her practice in specific ways that were congruent with her knowing and reasoning pattern. This way of knowing led her to remain in the lower range of reflective levels as evidenced by the coding of the data.

The Case of Shakira

Shakira, an African American woman who had been an instructional paraprofessional in an inner city public school for 3 years favored the independent knowing approach with the interindividual pattern of reasoning. This pattern is a natural progression from the pattern of knowing used by Elena, the transitional knower with interpersonal pattern of reasoning. Shakira's way of knowing is a more complex type in the continuum since it begins to view knowledge as more relative and context based than the previous categories. For this type of knower, most knowledge is uncertain; therefore, authorities are not necessarily reliable sources of information. Instead, Independent Knowers are more autonomous in their search for knowledge as articulated in the following responses from the MER questionnaire:

> I focus better on ideas and concepts because they show you how to use your own theories out of concepts learned . . . . In these types of classes the instructor gives you a chance to experiment with what works and what doesn't work. And you get a chance to learn from your own mistakes . . . when you know something because of experiences you have gone through, you learn how to organize your thoughts by using concepts that you have learned to support the theories you have created.

Thus as a learner, Shakira relies less on authorities for her source of knowledge and is more inclined to develop her own perspectives. Consequently, as an Independent Knower she prefers teachers who provide the context for her own exploration of knowledge and promote the expression of personal points of view. To her, evaluation of learning should be a mutual process involving both the instructor and the student. Independent knowers who use the interindividual pattern of reasoning value peers as sources of information as much as they value their own discoveries and constructions of knowledge. Although Shakira demonstrates a certain amount of independence and self-reliance in constructing her own meaning, she also values learning from her peers. During the interview, she described a favorable collaborative learning activity:

> Everybody had his or her part to do. In getting a project done together, one person might do the writing, another person might do questioning, another might do the research; and then you have the teacher. So I like that best because everyone's doing something and it's not all on one person. We were doing something where we all sat around and we all had our parts to do and when we finished, it came out all right.

This pattern of reasoning was also evident in her journals where she focused on her role as a teacher who promotes sharing of ideas and experiences. She described activities where knowledge was derived from group interaction in journal entry 11:

> The students created a map (of the school) and drew a line to show how they would travel around when they are going from one place to the next. They also had to include the travels they do with the class. This was interesting because Mr. Maxwell had me take the students . . . around the school to test the suggested routes they created and see if they were the easiest. One student found out her way was the longest and takes too much time. So we used the map to figure out the quickest way to get from place to place.

In this activity, students attempted to create the shortest route between two points in the school. Then they tested their hypothesis and discussed among themselves. The knowledge was constructed from the experience and the collaborative work.

The analysis of Shakira's journals revealed thinking in both non-reflective and reflective actions. Non-reflective action occurred only four times while reflective action was demonstrated on 15 occasions.

As an Independent Knower, Shakira looks at knowledge as being both certain and uncertain. In her 15 journals she focused on both types of knowledge. She concentrated on learning activities where knowledge is certain such as completing sentences with the correct verb tense (journal 2), looking for definitions of words in the dictionary (journal 4), identifying the placement of positive and negative numbers in a number line (journal 5), and matching words to their meaning (journal 6). On other occasions, she focused on activities where knowledge was not certain such as creating a web of ways to stay healthy (journal 3), learning about careers from a presentation made by parents, and designing hats (journal 12).

She also reached the highest level, that of premise reflection on one occasion. In journal 13 she showed this very sophisticated critical level of reflective thinking.

> As I was teaching I thought about how I could gain the attention of the class because it was obvious that they weren't with me. It was very hot in the classroom and the students were restless. There was a need for an air

conditioning but there wasn't any. The atmosphere wasn't good at all. I also noticed I really needed to work on how to carry on a lesson to captivate the students' attention. I felt that this lesson could have been done better with the right instructor. When I finished the lesson I walked into another fifth grade class and saw a more successful teacher. I explained to her what happened during my observation and she assured me it wasn't just me it was also the students. This is the lowest performing fifth grade class. But this information still didn't justify how I performed. This I will work on because I want to reach children and elevate them. If I can't do this, I am damaging them instead of helping them.

This journal entry shows how Shakira views knowledge as uncertain and seeks to find answers in different ways. The premise reflection lies in her critical judgment of the fifth grade teacher's comments. This is an example of critical reflection and requires a certain epistemological stance. Since the knowledge she was seeking concerning how to engage students in a learning activity was uncertain, she had to seek her own answer to the problem. She considered an authority for a possible source of the knowledge she sought but did not close her mind to the possibility that even the authority could be wrong. This openness to critically view the problem from different angles and to examine assumptions required at least the open-mindedness (Dewey, 1933) of the independent knower. Her openness to view authority as an equal, rather than someone with power above her also helped her to critically examine the assumptions of the successful teacher. This typical way of reasoning for the Independent Knower who uses the Interindividual Pattern, led her to reach the highest level of reflection. Shakira viewed her role of learner as an inquirer who sought answers to questions outside and within herself, considering all sources of knowledge equally valid. Yet, she only engaged in this type of reflection once during the study.

The journals from both participants showed a relationship between the epistemology and type of reflective thinking exhibited. Higher levels of reflective thinking were demonstrated by Shakira, who was an independent knower. Conversely, Elena who was a transitional knower, exhibited lower levels of reflective thinking.

It can be inferred from the analysis that the ways of knowing that are more complex lead to more frequency of reflective thinking and higher levels of reflectivity. The implication is that the more complex the epistemological stage, the more reflective the person will be. Furthermore, experience in the classroom did not seem to be a factor in the level of reflective thinking. In this comparison Shakira, who had been a paraprofessional for 3 years exhibited a more sophisticated level of reflective thinking than Elena, who only had worked in the classroom for

one. This finding contradicts studies that compare the reflective thinking of preservice and inservice teachers, but further study in this area is warranted. Nevertheless, Shakira demonstrated the highest level of reflectivity of all the participants, even surpassing a participant who had 15 years of experience in the classroom.

Conclusion

Studies have shown that teachers' views of teaching and learning are socially constructed (Connelly & Clandinin, 1994; Lortie, 1975,). These views impact on their ways of knowing and are the building blocks of their epistemology, which form their educational philosophies. These systems of beliefs create epistemic stances that in turn influence their professional practices such as reflective thinking. If teacher educators want to promote reflective thinking in teachers to the point where it becomes a habit of mind in their professional lives, a habit that lasts beyond their teacher preparation programs, then it is necessary to promote a development in their values about learning, a change in their epistemic stances. In other words, if teacher education programs are aimed at promoting educational reform, or aiming to prepare teachers who use sound, effective teaching methods, then these programs have to include activities aimed at promoting such transformation. This transformation needs to be situated at the very core of their being, at the affective level, where the values about practice are forged.

The connection between professional values and the professional practices of teachers is not a novel idea, certainly Dewey's (1933) prerequisite attitudes for reflection (open-mindedness, responsibility and wholeheartedness), are based on specific sets of values. Yet the magnitude of the task of developing teachers' professional actions is yet to be fully realized and others have alluded to the complexity of developing habits of mind such as reflective thinking (Mezirow, 1991). The study presented here though limited in generalizability, strongly suggests that this type of development requires a transformation through years of experiences and activities that will promote an epistemic stance leading to open-mindedness, and in turn, to the possibility of engaging on critical reflective thought. This deep level of development may be beyond the scope of four-year teacher preparation programs. It requires a carefully orchestrated curriculum during teacher preparation along with the appropriate professional setting after graduation, where teachers can engage in reflection and inquiry about their practices. Programs that infuse inquiry and action research in teacher preparation courses and educative mentoring in field experiences (Feiman-Nemser, 2001, p. 17)

can set the stage for the initial phase of such a development and are good examples of ways to promote critical reflective thinking in teachers at the pre-service level.

In providing the space for such development, pre-service teachers need to feel safe to explore their values and develop their practice. Therefore teacher educators need to possess the necessary open stance in themselves to allow for a multiplicity of perspectives in professional practice. This open-minded stance is implied in NCATE's standard that aims to promote reflective thinking in teachers yet, it is often overlooked. It is clear from this examination of the relationship between epistemic stances and reflective thinking, that the standards and policies currently being enforced presuppose the viewpoint that values multiple perspectives and context based knowledge. Thus, a way of knowing based on a receiving or transitional knowing stance (as the case of Elena) rather than inquiry is often considered less sophisticated. Yet, even this assessment of students' abilities can limit their development because it presupposes a correct way of thinking. Teacher educators therefore need to question their right to impose their own professional values on their students through their instructional practices, assigning grades to reflective journals where students are penalized when there is a lack of a critical perspective. If critical reflective thought requires specific epistemic stances, which are grounded in values, then teacher educators may be assessing their students' values, instead of their ability to reason logically on the pedagogical issues they face in their field experiences. Assignments that impose and judge the ability to think reflectively as being purely a cognitive process needs to be carefully examined.

In sum, this study indicates that reflectivity seems to be grounded on specific epistemic stances that are socially constructed. Therefore, the promotion of reflective teachers is a complex process that may require close attention in every aspect of a teacher preparation program. Most importantly, reflective thinking can not be taught through a few simple techniques but requires education that transforms the preservice teachers' ways of knowing, their views about knowledge and the roles of teachers and students. When reflective thinking becomes a habit of mind based on specific epistemic views that promote its development, then teachers will be able to make sound pedagogical decisions.

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