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From Tri-Cultural Conflict to Tri-Cultural Connection: How Successful Urban Science Educators Become Culturally Connected

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**FROM TRI-CULTURAL CONFLICT TO TRI-CULTURAL CONNECTION: HOW
SUCCESSFUL URBAN SCIENCE EDUCATORS BECOME CULTURALLY
CONNECTED**

A Dissertation Presented

by

MARLINA N. DUNCAN

Submitted to the Graduate School of the
University of Massachusetts Amherst in partial fulfillment
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DEDICATION

This dissertation is dedicated to my parents and grandparents for instilling in me the confidence to pursue my dreams. Your immeasurable love and support mean the world to me.

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The process of writing a dissertation has been a testimony to the value of a strong network of colleagues, friends and family. Thank you for nurturing me throughout this experience.

First, I would like to thank the science teachers who participated in my study. Your candid accounts of your experiences in and out of the classroom allowed me to gain a better understanding of ways to better support urban science teachers.

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ABSTRACT

FROM TRI-CULTURAL CONFLICT TO TRI-CULTURAL CONNECTION: HOW SUCCESSFUL URBAN SCIENCE EDUCATORS BECOME CULTURALLY CONNECTED

FEBRUARY 2010

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Urban districts suffer from a severe shortage of qualified science teachers.

Therefore, many new science teachers will need to take positions in urban districts with little or no exposure to urban communities. As a result, prospective teachers find it difficult to learn how to negotiate the cultural contexts of urban teaching. Consequently, it is essential for teacher preparation programs to begin to examine the cultural contexts of urban science teaching to understand how to support the personal and professional well being of novice urban science educators.

Through in-depth phenomenological interviews this research documents the experiences, perceptions, and beliefs of veteran urban science teachers and how they navigated pathways to successful teaching careers. Results focus on how the cultural levels of teacher socialization (personal, institutional, and societal) shaped their induction into the teaching profession. In addition, the analysis of the data suggests that teacher preparation programs need to be reconceptualized to include a specific focus on culturally relevant and responsive pedagogy, teacher identity development, and how to develop community networks and connections. This restructuring is key for novice urban teachers to either

increase their cultural sensitivity, or align their own cultural belief systems in-order to develop the necessary skill set to become successful urban science teachers.

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CHAPTER 1

INTRODUCTION

“We do not really see through our eyes or hear through ears, but through our beliefs” - Lisa Delpit

The number of teachers needed to fill K-12 public school classrooms is substantial and growing. Every school day, nearly a thousand teachers leave the field of teaching. Another thousand change schools, many in pursuit of better working conditions, and these figures do not include the teachers who retire (Ingersoll, 2003). A conservative national estimate of the cost of replacing public school teachers who have dropped out of the profession is \$2.2 billion a year; if the cost of replacing public school teachers who transfer schools is added, the total reaches \$4.9 billion every year (National Center for Education Statistics, 2002). Complicating matters, the demand for teachers is uneven, with most acute need in locations serving poor, minority youth in urban areas and teachers new to the profession are far more likely to leave than are their more experienced counterparts (Darling-Hammond, 2002). The largest 100 urban school districts in the U.S. educate approximately 40% of all non-white students and 30% of the students from low income families yet; teacher demographics in these large urban areas do not come close to matching the student population (National Center for Education Information, 2005).

In addition, science has often been identified as a field suffering from teacher shortage. Concern over shortages of science teachers and their impact on the state of science education have reached new heights (Calabrese-Barton, 2001). The most compelling aspect of the effects of poor science instruction in urban districts is the wide disparities

between the education of African American and Caucasian students, as shown by attainment on national and local tests, dropout rates, and post school success in the labor market in STEM fields. For example Berliner (2006) compared the relative performance of African American, Hispanic, and Caucasian students using data from the Third International Mathematics and Sciences Study (TIMSS). When the data were disaggregated by race, and each racial group was scored as an individual country, stark differences were evident in the outcomes of White, Black, and Hispanic students. Berliner noted “in science the scores of White students in the US were exceeded by only three other nations. But Black American school children were beaten by every single nation, and Hispanic kids were beaten by all but two nations”. (p.B3).

Results such as these are a clear indicator of an educational system that is oppressive to minorities, especially in urban schools.

High profile reports from groups such as Commission on Mathematics and Science Teaching for the 21st century, the National Academy of Sciences, and the National Research Council have all directly tied shortages to the quality of science education and in turn to the future well-being of the economy and the survival of the nation (NCEI, 2005).

In response, a wide range of initiatives have been implemented to recruit new candidates into teaching. Among these are career-changer programs, such as "Troops-to-Teachers," designed to entice professionals into mid-career switches to teaching, and Peace Corps-like programs, such as Teach for America, designed to lure the "best and brightest" into under-staffed schools (Viadero,1996). Many states have instituted alternative

certification programs, in which college graduates can postpone some or all of their formal education training and begin teaching immediately (Leland & Harste, 2005). Some school districts have resorted to financial incentives, such as signing bonuses, student loan forgiveness, housing assistance, and tuition reimbursement to aid recruitment (Ingersoll, 2003). These initiatives have often been targeted to the field of science. Despite these initiatives, identifying the problem of teacher supply and demand is still among the most important issues in urban schools, but it is also among the least understood. One theory for urban teacher shortage is a case of a wrong diagnosis and a wrong prescription, and that while policy efforts may be worthwhile, they alone are not solving the teacher-staffing problems schools are facing (Ingersoll & Perda, 2006).

The data show that, consistent with the conventional wisdom on teacher shortages, demand for teachers has steadily increased (Hussar, 1998). More importantly the data document that substantial numbers of schools have experienced difficulties finding qualified candidates to fill openings, especially in science (Berry, 2001).

While it is true that student enrollments are increasing, the demand for new teachers is primarily due to teacher turnover each year. The image that the data suggest is one of a "revolving door", an occupation in which there are relatively large flows in, through, and out of schools (Ingersoll, 2001, 2003). Moreover, while it is true that teacher retirements are increasing, the overall amount of turnover accounted for by retirement is relatively minor when compared to that resulting from other causes, such as job dissatisfaction and teachers seeking to pursue better jobs or other careers (Leland & Harste, 2005). Indeed, teaching is an occupation that loses many of its new members very early in their careers;

between 40 and 50% leave the field altogether in the first five years on the job (US Department of Education, 2002). Although this picture applies to a wide range of teaching fields, some important differences exist. As reported by the National Commission on Mathematics and Science Teaching for the 21st Century, science teachers have about the same rates of turnover as other teachers, but there is not an overwhelming surplus of newly prepared science teaching candidates (2000). The new supply of science teachers in the pipeline is not sufficient enough to cover the losses of teachers due to pre-retirement turnover.

For example, the data indicate that more than 45,000 math and science teachers left teaching just after the 2004-2005 school year (National Education Association, 2006). Only about 11,000 of these departures were due to retirement. More than twice as many of these teachers, almost 24,000, indicated that job dissatisfaction was a major factor in their departures (Ingersoll & Perda, 2006; National Education Association, 2006). This has large implications for fixing the problem. It means that solutions must not focus solely on teacher recruitment, but also on teacher retention. In plain terms, if the nation were able to recruit 30,000 new math and science teachers, as President Bush pledged in his 2006 State of the Union speech, this will not solve the problem if more than 45,000 math and science teachers simultaneously leave teaching. The image that comes to mind is a bucket rapidly losing water because of holes in the bottom. Pouring more water into the bucket will not be the answer if the holes are not first patched. The first step to patching the holes of the science teacher bucket is to evaluate the experiences of science teachers in urban districts.

Researchers in the literature tend to correlate high teacher turnover in urban districts

with the following factors; 1) pre-service and novice teachers not getting enough or the right type of practical training in real settings that would allow them to be properly prepared to be successful teachers of the urban poor, 2) lack of cultural awareness among teachers who seem to have cultural backgrounds vastly different from their students, 3) the lack of a sense of community or a sense of belonging among culturally diverse students, and 4) lack of training on culturally responsive pedagogy (Delpit&Dowdy 2002, Irvine, 2003, Ladson-Billings,2001). Unfortunately, the majority of teachers in urban poor areas are white. Therefore these teachers need to understand issues of representation and how their whiteness shapes the way they see students of color and those in poverty (Irvine, 1990). Consequently, the problem is not only that teachers need to be competent in their subject matter and teaching methodologies, but they also need to address the personal and social realities of race and class and their pedagogical implications.

Statement of Problem

By 2020, it is projected that one child in two will be of color and labeled a minority, with many living in poverty (National Commission on Teaching and America's Future, 2003). Taylor (2003, p9) attributes "the browning" of America, in contrast to the whitening of the teaching force, as the primary indicator for the need for new teachers to become more culturally aware. "As America grows more culturally diverse, so does the need for a more qualified, diverse and culturally skilled teacher workforce" (Darling-Hammond 1994, p185). The cultural education of novice educators is not a priority in all teacher preparation programs and is not seen as crucial during the induction process at

urban schools (Duncan-Andrade, 2005). Urban school districts often place the most inexperienced teachers in the most difficult and challenging schools and classrooms (Ingersoll, 2001). Rarely are new teachers provided support to help them succeed through the challenging first three years of teaching (Ingersoll, 1999). This often leaves beginning teachers feeling like failures and their self-confidence shattered; consequently, only the strong and most determined survive (Colbert & Wolff 1992). Therefore, the urban teacher shortage will continue to be a problem unless improved means of understanding, supporting and training new teachers are developed and adopted by urban districts.

In addition, new teacher support and training needs to include strategies to help novices create a cultural balance among the cultural contexts of teaching. Although there has been very little research in this area, a growing literature on cultural relevance provides insight into the importance of these relationships. The literature suggests that the combination of diverse students in Eurocentric schools results in a conflict of cultures (Ladson-Billings, 1995). Although schools endorse societal beliefs concerning equal treatment and equality of educational opportunities, certain practices such as the hidden curriculum, tracking, and discriminatory discipline practices are in direct conflict with those beliefs (Irvine, 1992). The conflict between a school's beliefs and its practices is characterized on the classroom level by a lack of understanding of diverse students' cultural values, norms, styles, and language (Tobin et al., 2001). This conflict appears to be related to the lack of qualified teachers in urban schools. Lack of "*cultural synchronization*" because of misunderstanding, missed communications, and low or no teacher interaction can result in novices having a negative teaching experience early on

(Irvine, 1992).

Given the staggering numbers at which new teachers leave the field, it is important to examine the experiences that can result in either confidence and comfort as a professional or a sense of isolation and despair as a frustrated novice. Cultural contexts do matter but the question is; how do teacher educators and urban districts prepare urban novice science teachers for the cultural contexts of urban science teaching and ensure that it has an impact beyond the initial year?

Purpose of Study

Many new science teachers will need to take positions in urban schools without working with teachers of diverse urban students prior to taking these positions. With little or no exposure to teachers of urban youth, either as student teachers or through an examination of current research which rarely focuses on a single secondary content area, prospective teachers will find it difficult to learn how to negotiate the cultural contexts of the teaching profession. Therefore it is essential for science educators to begin to examine the cultural contexts of urban science teaching to help understand how to support the personal and professional well being of novice science educators. A current demand for increasing and retaining the supply of quality educators, administrators, and policy makers reinforces the need for this type of research.

Significance of Study

This study is significant because results focus on how successful veteran teachers negotiate the tri-cultural spheres of socialization (personal, institutional, and societal) in the teaching profession, and how this process shapes their induction into the teaching profession. In addition special attention is paid to the relationship between the veteran teachers' image of self in response to school and local community culture. Examining the commonalities and differences in the teachers' experiences will help increase the understanding of how to better prepare teachers to work in urban districts.

Research Questions

The following research questions were the focus of this study:

1. How do veteran urban science teachers negotiate the tri-cultural spheres of teacher socialization (personal, intuitional, and societal) in order to maintain successful careers as urban science teachers? (Move from tri-cultural conflict to tri-cultural connection)
2. What strategies do urban veteran science teachers use to gain access and become legitimate participants in the school and local community culture in which they work?

CHAPTER 2

REVIEW OF LITERATURE

This literature review provides models, ideas, and principles that outline the impact of culture on teacher socialization and pedagogy. The central themes of this literature review are presented in three sections. Section I: Cultural Spheres of New Urban Teacher Socialization; Section II: Improving Cultural Awareness in American Schools--Culturally Relevant and Responsive Pedagogies; Section III: Moving From Tri-cultural Conflict to Tri-Cultural Connection in Urban Science Education.

These concepts are important because of the unique characteristics of novice teachers in urban districts and how culture mediates or conditions the socialization process. The lack of attention devoted to the interface between teacher socialization and cultural systems suggests insight must be provided from other disciplines, especially cultural anthropology and sociology to gain a full understanding of the relationship of culture and socialization.

Section I: Cultural Spheres of New Urban Teacher Socialization

Cultural Anthropology

For the purpose of this review, **culture** will be defined as the shared learned patterns of behaviors and interactions, cognitive constructs, and affective understandings that are learned through a process of socialization (Bourdieu, 1973, Atwater and Crockett, 1996, Connerly and Pedersen, 2005). These shared patterns identify the members of a cultural group while also distinguishing those of another group. It is a way of life and gives people a sense of who they are and how they should behave (Gay, 2000). Culture serves

as the median through which all human activity is transmitted and interpreted.

In K.A. Akoto's book *Nation Building (1992)* he expands this definition to frame culture as a tool used to interpret the world around us. He describes the function of culture as:

1. A lens of perception or cognitive framework in which to view the world.
2. Defines standards of evaluation by which to measure worth or legitimacy, beauty and truth.
3. Defines the conditions and/or means that motivates or stimulates a member (institutional and individual) of society and prescribes sanction for disruptive digression.
4. Defines collective and individual identity, roles, and responsibilities.
5. Provides a common language or means of communication.
6. Provides the basis for social organization.
7. Conditions the mode of production
8. Delineates a process for perpetuation of the culture. (pg. 31-32)

Akoto asserts that cultural functions provide the framework, in which identity is developed and affirmed. Individuals are best nurtured when participating in social institutions (education, work place, etc.) that reflect the values consistent with the familiar experiences of that individual. Therefore, it is a smoother transition for novice teachers to assimilate into a school district that is similar to their K-12 experience. Unfortunately, urban novice educators are usually not familiar with urban school culture, not a member of the local community culture, or socioeconomic

groups of the students they teach; as a result their ability to transition in and out of these cultural environments becomes a challenge (Boyd et al, 2005; Nieto, 2004).

This cultural change results in a “cultural conflict” and the novice is unable to assimilate and adapt to the new environment. The field of educational anthropology is concerned with the general concept and nature of acculturation. Although acculturation is usually in the direction of a minority group adopting habits and language patterns of the dominant group, acculturation can be reciprocal--that is, the dominant group can also adopts patterns typical of the minority group. Assimilation of one cultural group into another may be evident by changes in language preference, adoption of common attitudes and values, membership in common social groups and institutions, and loss of separate political or ethnic identification (Schmomer, 1994) Because a cultural system is in a continuous process of change, its dynamic nature implies varying degrees of change in culture over time (Bellah et al., 1985). Cultural change can occur from any of the following events; innovation in the culture, borrowing of ideas from other cultures, modernization, cultures in contact, and/or environmental alterations (Spinder, 1977). Culture is in constant motion; therefore change does not represent a shift from static to active, but a shift from one sort of change to another. (Ogbu,1995).

Treated as a group phenomenon, anthropologists refer to acculturation as cultural change resulting from direct, continuous contact of two distinct and autonomous cultural groups (Kottak, 2005). Reciprocal changes take place and subsequent alterations of original patters occur in one or both cultures (Kottak, 2005). Acculturation can be voluntary or involuntary. The nature and degree of acculturation depends on how different the original culture is from the culture of the host. According to Born (1970)

the more unrelated and opposing the two cultural systems, the greater frequency of intercultural conflicts. As a newcomer to a culture, one is required to cope with life changes thereby modifying life patterns (Born, 1970). The acculturation of newcomers involves a long-term process of cross-cultural adaptations. Thus, acculturation can be conceived to be the process of cultural learning imposed upon urban novice educators during the induction phase. As a result, making teacher socialization the acculturation into the teaching profession.

Teacher Socialization

"While urban schools do not necessarily require of their teachers a different set of skills or competencies than suburban or rural schools, they certainly demand that teachers be cognizant of the particular contextual and cultural variables that pertain to the urban setting" (Montero-Sieburth, 1989 pg. 333).

In this next section I define cultural socialization and concentrate on three primary forms of cultural contexts that contribute to the self-identity formation of urban teachers.

The term socialization is used by sociologists, social psychologist and educationalists to refer to the process of learning one's culture and how to live within it (Clausen 1968). It is the process by which individuals acquire the values, interests, knowledge, skills, and culture of the group, which in this case is the teaching profession (Feiman-Nemser & Floden, 1986). Whether messages are verbal or non-verbal, what is communicated affects members' perceptions of their new environment (Sleeter, 2001). Socialization is a process of learning about an organization or new environment. It is an ongoing exchange between the newcomer and veterans (Zeichner and Gore, 1990). As a reciprocal process, the newcomer negotiates his or her role, while the organization and surrounding community provide important information to the newcomer that helps in the socialization process (Berry, 2001). It is on-going throughout the individual's career with the

organization. The information exchange allows the novice to learn the acceptable values, norms, and required ways of thinking and acting that allow him or her to participate as a member of the profession (Abelson, 1986). The views of newcomers are formed by and reinforced by the interactions with veterans of the profession, the local community, and beliefs and values the novice brings from previous life experience (Irvine, 2001).

Professional socialization, has an influence on teacher quality and longevity. Socialization leads to identification with the local school community and persuading the teacher to take on the school's goals and missions. Socialization for the beginning teacher can determine whether the first year as a professional is a success or a failure. Thus, the process is an important one not only for the new teacher but also for the school community.

In the following section, I will focus on three key cultural contexts related to the development of novices' socialization: personal culture, institutional culture (school culture), and community culture. This design is based on the teacher socialization research that supports a model in which both individuals and institutions shape socialization patterns (Zeichner & Gore 1990). Previous research in this area has only addressed culture as one aspect of teacher socialization. In this review of literature, culture is the nucleus of the design to highlight how cultural contexts shape novices' socialization into the teaching profession.

Tri-cultural Model of New Urban Teacher Socialization

According to the literature, as part of the socialization process, it is important for novice teachers to increase their understanding of the integral relationship between culture and social behavior and the need to view their work within a cultural context (Villegas & Lucas, 2002). In addition, it is important to have a keen awareness of their culture. “For self-understanding, teachers should recognize their own ethnocentrism and bias and realize that their worldview is not universal nor their cultural norms absolute” (Rodriguez, 2001 pg. 1120).

Cultural competent teachers are needed to work with the culturally and linguistically diverse students in our nation's urban schools. Students from urban communities have their own learning traditions, styles, and preferences that are influenced by their cultural backgrounds; these learning styles may be in disharmony with the beliefs and values of their classroom teacher and the latest pedagogical theory used in classrooms (Cartledge & Loe, 2000, Ladson-Billings, 1995; Nieto, 1992).

The racial and cultural incongruence between teachers who are from the dominant culture and students who are not may be one factor that explains high teacher turnover (Ingersoll, 2001). Thus, some researchers think that it is crucial that teachers begin critical discussions about their own cultural identities and the cultural identities and perceptions of their racially diverse students (Morrow & Torres, 1995). The inability of today's middle class teachers to appreciate and understand the cultural capital that each student

and urban community contributes to the classroom may be the reason that minority students are not succeeding in school (Bourdieu, 1973). A major task of beginning urban teachers is to negotiate the conflicting aspects of the following three cultures; personal, institutional, and the local community.

Personal Culture

One's perception is his or her reality; therefore our understanding of knowledge is grounded and constructed within a particular social, political, cultural, economic, historical, and linguistic reality (Agada, 1998). In making meaning of what occurs in the classroom and local community a new teacher uses the filters or lenses of prior experience to interpret what is occurring (McAlpine & Crago, 1995). In other words, prior experience helps novices predict outcomes and make decisions about practice. For new teachers, if the culture is similar to their own experiences, then they can depend on prior experiences with greater conviction on the interpretation of their new surroundings. In addition, novices' past educational experiences are based on an educational system that has a history of racism, exclusion, and debilitating pedagogy (Nieto, 2000). "Hence novices put into practice what they themselves have been subjected to and perpetuate policies and approaches that may be harmful to many of their students" (Nieto, 2000, pg. 185). Unfortunately, novices are not given the opportunity to dispel the past lessons learned and they rely heavily on their own personal cultural beliefs to establish a norm. Subsequently, this norm is used as an instrument to navigate through the first years of teaching.

One's personal culture is derived from a variety of influences; racial/ethnic, religious

affiliation, and class backgrounds all contribute to the basis for social organization (Zeichner, 2003). Socialization into any new environment greatly depends on the lens of perception or cognitive framework in which one views the world. Therefore culture can be viewed as the foundation for adaptation. Other characteristics that influence cultural socialization include extent of teacher training and knowledge of subject matter (Calabrese-Barton & Yang, 2000). Novice teachers come into the profession with developed viewpoints, values and goals about the purpose of education and how students should be educated. These viewpoints, values and goals are influenced by past and present experiences and are tested in the initial years of classroom teaching. A lack of experience and support during the induction years can result in novices only relying on personal value systems for solutions to the challenges of beginning teaching.

During the formative years of teaching, beliefs of novice teachers are often challenged as they assimilate into the profession of teaching (Colbert & Wolff, 1992). Educators just entering the profession develop an understanding about themselves as teachers through experiences within the classroom and the school organization (Huberman, 1995). These beginning educators, as is true for all teachers independent of their career stage, are immersed in a process of self-analysis and reflection involving their teaching and learning (Johnson, 2001). This process can be further advanced through collaborative dialogue, providing an opportunity for interactions that often raise new connections, examples and consequences based on the realities of the classroom/school context (Gold, 1996). Given that both individuals and institutions shape socialization patterns, acculturation into the school community is a critical transition for novice teachers (Zeichner & Gore 1990).

Institutional Culture (Urban School Culture)

The key component to socialization is assimilating into the school culture in which one is employed.

"Urban schools have been described as sites where students defy teachers, parents and administrators; where administrators are concerned with keeping their schools open by trying to raise standardized assessment scores, provide security and uphold schooling as impermeable; where parents are disenfranchised from the schooling effort; where teachers view students as the enemy; where training rather than education takes place; and where daily survival is the paramount concern" (Montero-Sieburth, 1989, p.86).

According to Cochran-Smith, school culture has the greatest significance in the identity formation of most urban teachers for two reasons. One is that the teacher is being more intensely and extensively initiated into the norms and practices of the school than typically occurs in the pre-service level, even including the student teaching experience. (Cochran-Smith, 1995) Second, within the school, the carriers of the local culture and traditions are immediately and inescapably present; it is as if the novice is suddenly thrust into a "totalizing institution" (Cochran-Smith, 1995; Banks et al, 2005). Other factors in the school setting that influence socialization include guidance and support from administration, mentors, teacher colleagues, and access to curricular and professional development resources (Briscoe, 1991).

Unfortunately, urban school mentors, administrators, and colleagues have little or no training in leadership or mentoring (Gold, 1996). What's more, in many cases they are chosen not for their exemplary teaching or leadership potential but rather out of

convenience. Usually an administrator appoints a mentor based on seniority (Holloway, 2001). These senior teachers are often the ones most out of touch with students and least familiar and open to new and potentially more effective teaching and learning strategies. Cited in the literature, in more than a few cases (McAlpine & Cargo, 1995; Schwartz, 1996; Tobin, 2000), first-year teachers had critical comments about how they were advised from their school based mentors to deal with the unique characteristics of urban schools. In addition to poor mentors, urban novices are not informed about the unique cultural characteristics that must be negotiated by the staff:

1. The schools serve highly-diverse population whose cultural model of schooling is often different from and in conflict with that of the dominant culture (Ogbu, 1995).
2. The schools serve a large number of students who are linguistic minorities (Ogbu, 1995; Seller & Weis, 1998, 2000).
3. A lack of funding dictates decisions about teaching and learning (Weis, 2000).
4. High-stakes test results are the primary measure of teaching and learning.
5. Decision-making is centralized and invested in a bureaucracy that is politically isolated from the local communities' main interest (Weis 2000).

Individually each of these items is a challenge, but combined with the lack of strategies to understand or negotiate these unique characteristics can and does result in novices being overwhelmed and dissatisfied with teaching. Hand in hand with the school culture is the influence of the local community culture. Novices are often naive to how important it is to become familiar and appreciate the local community where their students live.

Local Community Culture

Urban schools are usually in communities but often not of communities. That is, teaching and learning are often disconnected from the day-to-day life of the community, and students do not see how the skills they acquire in school have currency in business, at home, and in other communities beyond school. Many culturally and linguistically diverse students come to our nation's schools from communities that have their own learning traditions, styles, and preferences (Atwater, 1994). Their learning styles and preferences, influenced by their cultural backgrounds, may be in fundamental disharmony with the beliefs and values of their classroom teacher and the latest pedagogical theory used in classrooms (Ladson-Billings, 1995; Nieto, 1992). Ironically, a universalized educational orientation or pedagogy that tries to teach students with the “best practices” of the dominant culture may prevent educators from recognizing the actual learning needs and strengths of “other people's children” (Bailey & Pransky, 2005; Delpit, 1995; Ogbu, 2003).

The student's community plays a significant role in the socialization of a novice educator. "The social, cultural, and historical context in which students live defines and shapes students and their experiences" (Atwater, 1996, pg 559). The assumptions, perspectives, and insights that students develop from their homes and community cultures are used as screens to view and interpret the experiences that they encounter in school and in other institutions within the larger society (Blanks, 1997). Regrettably, as stated earlier, most new urban teachers do not reside in the communities in which they teach; therefore their exposure and impact as role models to the local community is limited to the scheduled school day (Presseisen, 1998). The diminished sense of community lessens their communication with students, parents, and community members. As a result, novices rely

heavily on assumptions and stereotypes to interpret the local community surroundings. Novices come into teaching with beliefs about children and families who live in urban neighborhoods. According to the U.S. Department of Education, 84% of U.S. teachers are white and middle-class with limited experience with people of backgrounds different from their own (Wirt et al., 2005). A new teaching reality for which we need to prepare teachers in the 21st century is that "multiculturalism is simply a fact" (Oakes & Lipton, 2003). Another fact is that children spend only 1000 hours per year in schools as compared with 5000 hours spent in their communities and with their families (Berliner, 2006). These sheer numbers alone speak to the issue of the strong impact of the neighborhood. It is a force influencing children's learning that has to be recognized. When new teachers face a classroom of children who may be different from themselves (for example, in race, ethnicity, or language) how do they see and relate to the students and their families? Ayer (1998) believes that school people need to understand and respond to the conditions that shape students' lives rather than trying to "fix" community and family problems. It is important teachers prepare to work effectively with children they may perceive to be at risk and therefore, perhaps "unteachable" (Haberman, (2004). They have to be prepared to be effective in teaching children from a wide range of backgrounds. This is contrary to the idea that the culture of the students is irrelevant. As Ladson-Billings (2001) points out, in a "middle-income, white, English-speaking school community, teachers do use student culture as a basis for learning" (p. 99). That culture is invisible. It is only when the children's home culture is different from the school norms and school culture that it becomes visible and often seemingly problematic. In order for all teachers, and especially teachers in urban areas to be successful, they have to take

responsibility for learning about the culture and the community of the children they teach (Ladson-Billings, 2001). Nieto affirms that prospective teachers, particularly those who are white and middle-class, need cross-cultural opportunities with families and students who are neither white nor middle-class and who often speak a language other than English at home. It can be argued that without connection to diverse schools and local communities, bias and stereotyping of children by teachers may go unexamined and interfere with the success of the children in school (Cochran-Smith, 1995). Schools cannot work successfully in isolation from students' families and communities (Epstein & Sanders, 1998 ; Henderson & Mapp, 2002). Epstein (1995) describes the overlapping spheres of influence determining a child's achievement. Teachers play the central role in the overlapping spheres of family, community, and school. It is clear that it is important for teacher candidates and novices to learn about the inclusion of children's social and cultural contexts in the school experiences.

In addition, despite the cultural diversity of urban communities, the prevailing assumption among many white middle class novice educators is that learning for minority low-income students is the same as it is for any other group (Perry, 2003). But since learning is fundamentally contextual, there are different social, emotional, cognitive, and political competencies required of low-income urban youth (Perry, 2003). In some instances, the rules from family and community may be compatible with those of the school, but, in others, the incompatibility of home/community and school norms can create dissonance for the urban student (Gay, 2000). This conflict creates a gap between the urban community culture and the school culture.

In the book Young, Gifted and Black, Perry (2003) argues that low-income urban minority youth are not successful in American public schools and their families are at odds with the structure and standards due to the following dilemma:

Low-income urban minority youth and adults have a hard time committing to working hard in American public school districts, given that:

1. They cannot predict when or under what circumstances this hard work will be acknowledged and recognized by individuals in and out of school.
2. Achieving in school is separation from the cultural reference group.
3. No matter what other members of the reference group accomplish, these accomplishments are not likely to change how the group is viewed by the larger society or to alter the caste like position in the society. (pg. 4-5)

It is clear that the literature supports new teachers, need to see the big picture of how to relate to families. They also need to know about the specific communities in which their students come from: What are community members concerns? What do they value? Where do families shop? Go to church? Play?

For these reasons, the three cultural spheres (personal, local, and school community) of cultural socialization shape the induction experience of a novice urban teacher. Therefore, the task of a beginning urban teacher is to negotiate the conflicting aspects of these three cultures; personal, institutional, and the local community. If novices

struggle to negotiate these three cultural contexts during the socialization process into the profession, a phenomenon I have coined Tri-cultural conflict occurs. The next section will outline tri-cultural conflict and the importance of cultural balance for novice urban educators.

Tri-cultural Conflict

“Being in the city was radically different from anything I had experienced. I remember clearly my initial train rides. As we approached my destination the train became crowded with high school students headed for the nearby City High School. The students were unlike any I taught or observed. All were African American and many were from conditions of relative poverty. As I listened to them interact in the crowded conditions of the train I could scarcely understand their dialects. I wondered then whether I’d ever be able to teach students like these. The strangeness of the environment was greater than I expected and was analogous to being in a new country with a distinct culture. So much was novel. But I was no tourist. I worked here” (Tobin, 2000, pg 89).

Like researcher Kenneth Tobin’s experience, as a novice urban science teacher, many new urban educators experience the notion I call tri-cultural conflict. They enter the urban teaching profession unfamiliar with the school and local community culture. The experience is analogous to being in a new country with a distinct culture different from their K-12 experience (Tobin, 2000). Therefore, novices come into the classroom with strong beliefs about teaching and learning that may be in direct contradiction with the beliefs and norms of the school and local community. Teachers within impoverished urban schools are so overwhelmed by the demands of their teaching environments that they can barely function (Beijaard & Verloop, 1996). They carry theory around in their heads, but they often do not know how to apply this knowledge in the given context because they are so at odds with the institutional policies and practices of the district and community (Bollin & Finkel, 1995). Compounding their predicament is the instructional grouping design for diverse categories of students, which results in

tracking, bilingual education, and vocational education (Montero-Sieburth, 1998). Therefore, even among the best intentioned urban teacher who believe in differentiated instruction in the forms of constructivist, inquiry based, and critical thinking teaching styles, when applied to low socioeconomic students these philosophies and practices are not implemented and teaching and learning has little relevance to urban students' lives. This existence offers few opportunities for urban teachers to consider their roles in the context of the unique personalities and cultures of their schools and communities.

Based on the results of my pilot study, Tri-cultural Conflict: How Cultural Contexts Affect Urban Novice Science Educators, part of succeeding as a teacher and staying in the profession is socializing into the urban teaching community. In a suburban setting, the suburban new teacher begins to teach in a school with a familiar culture and teach students with a familiar cultural background. The socialization process is smooth because there are fewer cultural differences. When the new suburban teacher goes to teach in the urban setting the school culture is different from what he/she experienced as a student or student teacher. The culture of the local community, students, and school is different from that of the novice teacher. There is conflict among cultures making it difficult for urban novice educators to negotiate the cultural spheres of socialization.

Many novices find adapting to the cultural spheres of socialization the most challenging component of their new job. They were never taught how to negotiate the unfamiliar school and community cultures in contrast to their own cultural beliefs.

In order to better understand the cultural conflict with teachers and students in urban poor districts, we need to explore the communication mechanisms that exist in the classroom between middle class, usually White teachers, and urban poor students. Gay and Howard

(2001) and Morrow and Torres (1995) believe that, with increasing cultural diversity of students present in urban schools, it may be wise for new teachers to enter the workplace with an expanded cultural awareness, skills and knowledge to be able to communicate with and instruct these diverse populations. A key pedagogical approach is for teachers to design and develop culturally relevant teaching strategies (Howard, 2001, 2003).

Section II: Improving Cultural Awareness in American Schools-Cultural Relevant and Responsive Pedagogies

Culturally Relevant Pedagogy

The need for culturally responsive and culturally relevant pedagogy prompts one to examine the relationship between suburban, middle class teachers and urban students, and to ask the question, what does culture and cultural awareness have to do with academic success? Does a lack of cultural awareness and culturally relevant pedagogy contribute to academic failure among urban minority students?

Research by Delpit (1995), Foster (1997), Irvine (2003), Ladson-Billings, (2000) suggests that there are some aspects of teaching important to student learning that may be differently valued and represented in the repertoires of successful teachers in urban, minority contexts. Although referred to by different names, each researcher stresses the importance of urban teachers being “culturally relevant”. Their work emphasizes “cultural solidarity” as a key characteristic of successful urban teaching, linking classroom content to students’ experiences and focusing on the whole child and incorporating familiar communication and cultural patterns.

Culturally responsive pedagogy may reverse the perennial underachievement that has become the norm for an increasing number of minority students (Gay, 2000). Bourdieu

(1973) cautions that such a critical reflection should not be an indictment against teachers. Rather, it should be a process of improving practice, critically examining philosophies, and becoming effective teachers for today's growing diverse student population. Howard (2003) believes that "given the current cultural and racial demographics of our schools and society, the stakes we face as a profession and as a nation are too high to fail in this endeavor" (p. 6). The processes of learning cannot be divorced from the cultural contexts in which they occur (Freire, 1993). Pedagogy in the United States flows out of middle class and affluent, mainly European-American, cultural ideology. Children from the dominant culture in these communities have been trained in their homes to learn in ways consistent with these beliefs, but that is not true for children who are not members of the dominant culture.

Therefore, an equitable multicultural classroom cannot be based solely on dominant culture norms.

Culturally and linguistically diverse students are disadvantaged by educational practices that do not build on the cultural capital they bring to the process of schooling (Gay, 2000). When teachers fail to actively incorporate these students' varied orientations into classroom learning processes, disempowerment is the inevitable result.

Therefore, just because a teacher believes in equity does not mean that a teacher creates an equitable classroom environment, or even knows how to initiate the process of creating such an environment (Bailey & Pransky, 2005). Bailey and Pransky (2005) suggest that it is the responsibility of educators to (a) understand that learning processes are inextricably enmeshed in cultural practices; (b) take on the challenge of investigating the cultural roots of their most cherished theories as well as the beliefs and values that

animate their own teaching practices; and (c) create more equitable classrooms by bridging the complex mismatches between their own preferred ways and those of their culturally diverse students. The need for critical self reflection is important for teachers to recognize if they consciously or subconsciously subscribe to deficit-based notions of culturally diverse students, for such an examination places emphasis on the academic success of students in culturally diverse urban classrooms. Gay suggests the key to success for all is the incorporation of caring and nurturing, which is an integral component of culturally responsive pedagogy (Gay, 2000). Increased cultural awareness, along with culturally responsive pedagogy and caring, set the foundation for a sense of community within the classroom.

Therefore what is important, within a culturally relevant pedagogical framework, is for teachers to ask themselves if “who we are” contributes to the underachievement of culturally-diverse students, if we as educators are responsible for creating a “culture of silence” (Freire, 1993; Weis & Fine, 1993) among minority students, where students rebel against the pedagogy of the dominant culture with silence and non-participatory behaviors in the classrooms that lead to extremely poor academic and career related success.

To provide meaningful knowledge and strategies for teaching within today’s cultural context, it is important for teachers to be able to analyze important issues such as culture, ethnicity, and race to recognize how these concepts shape students’ learning experience (Shade, Kelly, & Oberg, 1997). Furthermore, it is important for teachers to construct pedagogical practices that have relevance for students’ social and cultural realities if the learning process is to be effective, especially since it is very common for teachers to be

attracted to ways of thinking that affirm and embellish the culturally influenced ideals, beliefs, and values that they already hold (Bailey & Pransky, 2005; Freire, 1993).

Therefore, educational “best practices” should be predicated on a set of cultural ideals, beliefs, and values that are grounded in the context of the students that are being taught (Erickson & Mohatt, 1982; Philips, 1983).

There is a need to examine and document teaching methods and techniques, which have been shown to be effective toward the science education of minority students, which are reducing the inequity in academic and science achievements among students of color noted by Valverde & Schmidt (1998). Numerous researchers suggest that pedagogy should meet the academic and social needs of all the students within the classroom, in the form of culturally relevant and culturally responsive pedagogy (Gay, 2000; Howard, 2001; Ladson-Billings, 1994, 1995; Shade, Kelly, & Oberg, 1997). Phuntsog (1999) suggests that: culturally responsive teaching encompasses respect for diversity; creation of a safe, inclusive, respectful environment; integration of responsive teaching practices in all disciplines; and transformation of curriculum to promote social justice and equity in society. (p. 1)

Gay (2000) defines culturally responsive teaching as “using the cultural knowledge, prior experiences, and performance styles of diverse students to make learning more appropriate and effective for them (p.29).

Gay (2000) also describes culturally responsive teaching as having the following characteristics:

1. It acknowledges the legitimacy of the cultural heritages of different ethnic groups, both as legacies that affect students' dispositions, attitudes, and approaches to learning and as worthy content to be taught in the formal curriculum.
2. It builds bridges of meaningfulness between home and school experiences as well as between academic abstractions and lived sociocultural realities.
3. It uses a wide variety of instructional strategies that are connected to different learning styles.
4. It teaches students to know and praise their own and each others' cultural heritages.
5. It incorporates multicultural information, resources, and materials in all the subjects and skills routinely taught in schools (p. 29).

Therefore, culturally responsive pedagogy is more about responding to the individual personal needs of the students, while culturally relevant pedagogy speaks to the use of appropriate curriculum. The idea of cultural relevancy in teaching was introduced by Ladson-Billings (1992), as “a pedagogy that empowers students intellectually, socially, emotionally, and politically by using cultural referents to impart knowledge, skills, and attitudes” (p. 382).

Ladson-Billings (1992) found that teachers most successful with African American students, encourage children to choose academic excellence, maintain their cultural identity, and are aware of the position of African Americans in society and how it affects expectations of students (p. 389). These teachers are concerned about the inequities in society and schooling. They see their role as helping students become aware of these inequities and use pedagogy that is liberating, rather than maintaining the status quo, by explicitly teaching students how to gain social and political access (Ladson-Billings

1992, p. 388). From additional research on successful teachers of African American students, Ladson-Billings (1994) found that these teachers encourage individual achievement and help students develop a broader socio-political consciousness allowing them to critique cultural norms, values, and institutions that produce and maintain socio-economic inequities (p. 118). These teachers have a strong sense of efficacy, believe that one has or can acquire the skills and resources to teach a child regardless of race or class; rely on personal and professional experiences, as well as students, parents, and communities as resources for teaching and need to demonstrate that they believe all students are capable of learning and believe they are capable of making a difference in the educational lives and communities of their students.

According to Haberman (1995), successful teachers of students in poverty see how education, schools, and teachers contribute to the failure of students and work against perpetuating these practices and policies (pp. 52-53). Effective teachers of students in poverty believe that regardless of the life conditions their students face, they as teachers bear the primary responsibility for sparking their students' desire to learn (Haberman, 1995, p. 53).

To be culturally relevant, the literature and the lesson plans in the classroom should reflect multiple ethnic perspectives and literary genres. For example, math instruction should incorporate everyday-life concepts, such as economics, employment, and consumer habits of various ethnic groups. In order to teach to the different learning styles of students, activities would reflect a variety of sensory opportunities, such as visual, auditory, and tactile (Gay, 2000).

Culturally relevant teaching could help subjects like science come alive for many students, especially those who have traditionally been uninterested in science; and examples, analogies, and investigations based on students' personal experiences and on cultural contexts could promote curiosity and help students build a personally meaningful framework in subjects such as science (Atwater, Crockett & Kilpatrick, 1996; Ladson-Billing, 1995) and in school in general (Phuntsog, 1999).

According to Hollins (1996) education designed specifically for students of color incorporates "culturally mediated cognition, culturally appropriate social situations for learning, and culturally valued knowledge in curriculum content" (p. 13). Culturally responsive teachers realize not only the importance of academic achievement, but also the maintaining of cultural identity and heritage (Gay, 2000).

Evidence That Culturally Relevant and Culturally Responsive Pedagogy Works

Ladson-Billings (1994) studied actual instruction in elementary classrooms and observed culturally responsive and culturally relevant values being demonstrated. She saw that when students were part of a more collective effort designed to encourage academic and cultural excellence, expectations were clearly expressed, skills taught, and interpersonal relations were exhibited. Students behaved like members of an extended family-assisting, supporting, and encouraging each other.

There are research studies that suggest that culturally responsive and culturally relevant pedagogy work (Barton, 1997; Beauboeuf-LaFontant, 1999; Blank, 1997; LAB at Brown, 2004; Cooper, 2003; Delpit, 1998, 2003; Gay, 2000; Howard, 2001, 2003; Ladson-Billings, 1992). For example, in a study by the LAB at Brown University (2004), thirteen 1st-12th grade urban educators selected from seven cities across the United States examined their successful classroom management strategies to determine which represented culturally responsive or culturally relevant teaching. The LAB at Brown University (2004) then compared the teachers' list with a list that they had already compiled as being representative of culturally responsive teaching. The characteristics of culturally responsive teaching developed by the LAB at Brown University are (2004):

1. Include parents and families in the learning process - invite parents to come to school to view their children's work, not just during open house.
2. Call parents often just to chat about student progress, especially accomplishments.
3. Communicate high expectations - constantly challenge students to do more difficult work.

4. Allow students to learn within the context of culture – become culturally responsive to the needs of all of the culturally diverse students in the classroom.
5. Student-centered instruction - let students lead and do work and express themselves in small groups.
6. Culturally mediated instruction - become culturally aware and culturally responsive to all students in the classroom.
7. Reshape the curriculum - to be more culturally responsive to the needs of all students.
8. Teacher should be more of a facilitator - let students work in small groups, constructing their own meaning from classroom activities.

Characteristics of culturally responsive teaching that emerged from the teachers included:

1. Development of personal relationships with students - get to know each student personally through one-on-one conversations.
2. Creation of caring communities - demonstrate to students through one on one conversations that you care about each student.
3. Establishment of business-like learning environments - establishes firm guidelines for how you want assignments to be completed, establish high expectations.
4. Use of culturally and ethnically congruent communication processes that demonstrate mutual respect for students - you do not have to speak the language, but you should learn to understand the language of each cultural group in order for each student to derive meaning from each lesson plan.
5. Demonstrations of classroom management- students need to know that the teacher is in charge and is able to control the class.

6. Utilization of clearly stated and enforced expectations - students need to know that you think that they can do more challenging work.

After comparing the culturally responsive teaching characteristics developed by the LAB at Brown (2004) with those developed by the teachers, a great deal of agreement was found in all areas, except “caring” and reshaping the curriculum. The LAB at Brown (2004) did not include the very important component, “caring.” It would be interesting to explore why the LAB at Brown (2004) did not include something that the teachers thought be to very essential. The teachers did not include “reshaping the curriculum,” perhaps because it is something that they automatically do each day, as implied in #4 of their list, and because of what they said about everything in the classroom being a constant state of trial and error.

Although the thirteen urban teachers thought that their strategies were necessary in culturally responsive teaching, they expressed concerns over the ability of teacher education programs to effectively prepare pre-service teachers to successfully use these classroom management strategies because they did not learn these strategies in teacher training workshops. They reported that they acquired the strategies through trial and error over time in the classroom, and as a result of personal pursuits to establish success for all students in their classrooms. The high attrition rate of new teachers in the first 5 years of their teaching careers (Crosby, 1999; Darling-Hammond & Sclan, 1996; Haberman & Rickards, 1990; Ingersoll, 2001, 2003; Rowan et al. 2002) may be due to not being around long enough to acquire the necessary skills to ensure their success in the classroom.

The research results by the LAB at Brown (2004) study indicate that dedicated, committed teachers can make a difference in the successful outcomes of minority students. Therefore, it is clear that more teachers should re-think, re-develop, and redesign pedagogical practices if more underachieving students are going to be successful in school (Davies, 1990). According to Tomlinson (2002), it is important for teachers to recognize that students want to:

1. Feel safe, cared for, and listened to.
2. Feel that they make a difference at school.
3. Do significant work that relates to them and their world.
4. Believe that they are making a choice that adds to their success.
5. Do work that meets and then exceeds their ability.

Helping Teachers to Become Culturally Aware

There are specific areas that should be essential to the development of culturally relevant teaching practices (Stempelski, 1998). First, teachers should acknowledge commonly held deficit-based notions about students of color. We all look at the world from our own cultural background, e.g, teachers bring their own cultural backgrounds that affect their thinking, practices, and placement. Second, culturally relevant pedagogy recognizes or should recognize the explicit connection between culture and learning, and see students' cultural capital as an asset and not a detriment to their school success. Third, culturally relevant teaching considers how traditional teaching practices reflect middle-class, European American cultural values, and thus should seek to incorporate a wider range of dynamic and fluid teaching practices (Davies, 1990).

A deficit-based approach to the education of African American students ignores the concept of teaching from the knowledge base of the learner (Henderson, 1996).

Henderson (1996) proposes that the deficiency lies in a system of education that refuses to adapt itself to differences among students.

In order to become culturally aware and culturally responsive to the needs of the various cultural groups in the classrooms, Rabinowitz (2004) suggests that teachers should consider, in a reflective process:

1. How frequently and what types of interactions have I had with individuals from other racial backgrounds?
2. Who were the primary persons that helped to shape my perspectives of different racial groups?
3. Have I ever been prejudiced against people from different racial backgrounds?
4. If so, what effects do my personal thoughts have on students within my classroom.

Cultural Relevant Pedagogy in Urban Science Education

As stated in the prior section, teachers' classroom practices are framed in specific social, cultural, and educational contexts (Calabrese-Barton, 2001; Rodriguez, 1998). This concept is especially important in relation to specific contents areas in urban districts, as teaching and learning situations are more complicated in terms of socio-cultural aspects.

Sociocultural studies in science education have taught us that it is just as important for urban educators to help students become legitimate participants in the science learning community as it is teaching the content of science (Aikenhead & Jegede, 1999; Seiler, 2001). For some authors (i.e., Aikenhead & Jegede, 1999), this process involves teachers learning to cross borders between cultures. These studies are grounded in the belief that the science classroom is its own subculture, with particular ways of knowing, talking, and doing that do not always clearly align with the social worlds that youth bring to learning science. In this instance, educators need to be able to build a bridge between these two worlds.

Aikenhead and Jegede (1999), among others (i.e., Bailey & Pransky, 2005; Rodriguez, 1998; Freire, 1993), write about how learning to participate in the subculture of school science is often treated as a process of assimilation rather than enculturation. In this view, science instruction is at odds with students' worldviews, and successful science learning forces students to "abandon or marginalize their life world concepts and reconstruct in their place new scientific ways of conceptualizing" (Aikenhead & Jegede, 1999, p. 274). Therefore, the challenge for novice urban science educators is to consider how science teaching and learning might look if students were supported in becoming fluent in the subculture of school science while not simultaneously abandoning their worlds.

The question remains can novice educators learn how to build a bridge between the student's world and the science world through cultural relevant pedagogy?

Much of the literature addressing the challenges of preparing teachers for teaching students of color and those in poverty is increasingly focused on culturally relevant pedagogy.

Culturally relevant pedagogy, in relation to science instruction, questions the relevance of science to students who have been underrepresented by the education system and argue that science education should start where the student is.

Shujaa (1995) asserts that the intent of culturally relevant pedagogy is to increase student achievement, to help students develop the skills to achieve self-sufficiency, and to develop citizenship skills based on a realistic and thorough understanding of the political system (p. 200). Mehan, Lintz, Okamoto, and Wills (1995) argue that when culturally relevant pedagogy is not accompanied by an academically rigorous curriculum, minority students will most likely not benefit from it (p. 141).

Therefore, culturally relevant pedagogy works to assist students from marginalized communities by focusing on academic achievement. This requires teachers who possess in-depth knowledge of students, subject matter, pedagogy and the social implications of education.

The following section focuses on how tri-cultural conflict contributes to poor science education in urban districts in the US.

Section III: From Tri-Cultural Conflict to Tri-Cultural Connection

Tri-Cultural Conflict and Urban Science Education

The studies in this area focus on how cultural conflicts emerge in science classes between the culture of urban schooling, the culture of science, and the culture of urban students' homes.

In a series of articles, Tobin and his colleagues (Tobin, 2001; Tobin, Roth & Zimmerman, 2001) illustrate how institutionalized low expectations and teacher's cultural misreading fuel poor science education in urban districts.

Tobin reports that the cause for poor academic performance by urban youth is a result of low teacher and school expectations. Tobin's studies are supported by similar findings from another study: Griffard & Wandersee, 1999) report that in depth case studies of two African-American female high school students provided evidence for a cycle of "cognitive disengagement' perpetuated by complex cultural factors that permit cognitive passivity, confidence-without-- competence, and attention to behavior over learning"(p.9) Both of these young ladies were considered high achievers and attended a half day science/math academy. Despite their accomplishments on paper, both young ladies had poor conceptual understanding and skills in science as well as other academic subjects, creating a conflict between the culture of schooling and the culture of science. Their grades and opportunity to attend the math/science academy were rewards for appropriate behavior in school, therefore reinforcing the institutionalized low expectations of urban districts.

Tobin's experiences teaching in a high-poverty urban high school led him to conclude that breaking the cycle of institutionalized low expectations and social reproduction among inner city youths is an extremely complicated and deep-seated issue. He argues that if we are to uncover these damaging dimensions of schooling, we need to rethink not only curriculum practices but also the role of the teacher and the practices implemented consciously and unconsciously for and against students in the classroom. He argues that a master teacher of non-inner city youths alone cannot break this cycle, even with the best of intentions, without paying attention to how the worlds of teachers and students collide; we will never change the culture of urban districts (Tobin et al., 2001).

Other studies in urban science education have dealt with the cultural clash between home and school and also directly with the culture of power. A case study of Miguel, a young Puerto Rican father raising children in a US inner city, reported by Calabrese Barton & Yang (2000), provides a contextualized glimpse into the culture of urban high schools and how that process is linked to who has access to the culture of power of school science. Their detailed portrait of Miguel reveals a life filled with contradictions. Outside of school, Miguel enjoyed, excelled at, and was supported in science as was evidenced by his successful black market herpetology business. Inside of school, however, Miguel was counseled away from science, and other academic courses, and eventually dropped out of school all together, a decision supported by his family who saw more relevance in his role as worker than as a student. Family and community cultural expectations and differences taught Miguel that science was not for him, kept the rules for participation in the school science culture of power invisible, and reinforced Miguel's belief that only 'special people' were invited to become scientists. Miguel's science story is supported by

earlier research that revealed that students of color were more likely to have a difficult transition between home and school, whereas white middle class students were more likely to have a smooth transition into the world of school science (Costa, 1995).

These studies begin to reveal how the implicit purposes and goals of schooling in urban science education work against social justice. These studies describe how high-poverty urban students' rejection of school science rests in some sort of conflict between the culture of schooling, the culture of science, and the culture of home. Yet, each of these studies also shows how all of the cultures collude to keep inner city students out of science. Although cognizant of these contradictions, none of the studies presented use cultural conflict as a tool to push forward our understandings of culture, power and a just education. Finding and analyzing these spaces of conflict and using them, may help to enhance our understandings of what teachers need to know and the roles they need to play in urban districts to improve science education. As well as what students know, and need to know, and the role(s) they play in urban science education. Furthermore, an in-depth understanding of cultural conflicts in urban science education will help create implicit purposes and goals of urban science education that will drive science for all.

Tri-Cultural Connection-Successful Urban Educators

The studies in this area focus on the characteristics of successful urban educators and how teacher education programs and urban districts can help novices move from cultural conflict to being culturally connected. In addition to looking at pedagogical and content knowledge as a measure for successful practice, the following review of literature will

expand the paradigms of practice to include additional knowledge, skills, and dispositions for successful urban teaching.

Although teachers cannot change the culture into which they were born and raised, they can gain a better understanding of their own culture, those of their students, and the historical relationship between the two and become culturally connected (Delpit, 1995). Literature on culturally connected teaching considers it as a subset of culturally relevant teaching. The term “culture” is used to denote how teachers do and understand their craft, referring to the behaviors, beliefs, and artifacts of the local community of the particular students in their classrooms and or schools (Ensign, 2003). According to Irizarry (2005), “cultural connected teaching extends the current discourse regarding culturally responsive pedagogy by creating a framework for understanding the fluidity of culture and the variety of ways that members of a cultural group express their identities” (pg 34). The development of culturally connected teaching is active and constant. It requires teachers to go out into various cultural communities as opposed to just waiting for students to bring their cultures to class. A culturally connected framework does not conceptualize culture solely in terms of ethnic characteristics of a specific group. Rather, it takes into account the development of hybrid identities that emerge as a result of members various cultural communities negotiating their identities and forging new socioculturally situated identities (Gee, 1999; Yon, 2000). It also highlights the potential for teachers who are not members of the same racial or ethnic group as their students to become connected and improve their practice.

Culturally connected teachers have a unique set of characteristics to help their students “live decent, productive lives, regardless of the conditions under which they are forced to live and grow” (Haberman, 1999, p.3). In addition, they must be able to work with “burned-out” colleagues in dysfunctional urban school bureaucracies and be able to relate to a highly diverse set of parents and caregivers. Haberman also asserts that culturally connected teachers and teacher candidates must be able to convince students who do not see the value of succeeding in school of its importance.

There are limited studies in the literature that focus on culturally connected teachers and their practices and there is a gap in the literature of subject specific culturally connected teachers.

In summary, the findings from the literature review corroborate the view that tri-cultural conflict does matter. Being able to adapt to new cultural contexts is essential for novice urban teachers to understand the impact of teaching in an environment that is different from their own. The review of the literature also provides evidence in support of the view that it is valuable for teacher educators to understand the importance of helping pre-service teachers create a cultural balance during the induction phase of their profession. With a better understanding of the cultural contexts of teaching we can help promote the professional and personal well being of beginning urban science teachers.

After reviewing the literature to learn what others think about the impact of culture on teacher socialization and urban science teaching of low socioeconomic urban students of color, it would be beneficial to explore;

1. How veteran urban science teachers negotiate the tri-cultural spheres of teacher socialization (personal, intuitional, and societal) in order to maintain successful careers as urban science teachers? (Move from tri-cultural conflict to tri-cultural connection)
2. What strategies do urban veteran science teachers use to gain access and become legitimate participants in the school and local community culture in which they work?

Answers to these questions will be explored by examining the experiences of veteran high school science teachers, who are thought to be excellent in their field and are currently producing positive outcomes among underachieving students in urban districts.

CHAPTER 3

METHODS AND PROCEDURES

After a careful review the literature to learn what others have learned about the impact of culture on teacher socialization and urban science teaching of low socioeconomic urban students of color, I found there is a limited amount of information regarding the following questions;

1. How do veteran urban science teachers negotiate the tri-cultural spheres of teacher socialization (personal, intuitional, and societal) in order to maintain successful careers as urban science teachers? (Move from tri-cultural conflict to tri-cultural connection).
2. What strategies do urban veteran science teachers use to gain access and become legitimate participants in the school and local community culture in which they work?

The answers to these questions were explored by examining the experiences of veteran high school science teachers, who are thought to be excellent in their field and are currently producing positive outcomes among underachieving students in urban districts.

Overall Approach to the Study

Although quantitative research is very effective for many studies, social science researchers interested in knowing such phenomena as why an event occurred, the perspectives held by participants, or how settings affects behaviors, frequently choose qualitative research methods (Bogdan & Biklin, 2003). The intent of this research is to gain an in-depth understanding of the cultural contexts of urban science teaching. I used in-depth phenomenological interviewing (Seidman, 2006) as the primary source of data collection to examine the perceptions of the participants' life experiences, professional stories, and reflections of veteran urban science teachers.

Of the many techniques used for in-depth interpretive research methods, interviewing is recommended as one of the most suitable and valuable tools to discover how humans construct multiple social meanings (Seidman, 2006). Therefore, in-depth phenomenological interviewing (Seidman, 2006) was the primary source of data gathering. In addition to the in-depth interviews, I also used classroom, field trip, and staff meeting observations, member checks and group interpretation and analysis of data for triangulation purposes. This methodology design created a non-threatening environment where researcher and participants could share and explore the pleasant or sensitive issues around their induction into the urban teaching profession in an in-depth and honest way.

According to Seidman (2006), a qualitative method is reliable and valid if it demonstrates rigor in its data gathering, if it is reproducible, and provides evidence for, adequacy in its selection of its participants, as well as for appropriateness of the instruments used in data collection. The following section provides discussion and documentation of how this was achieved in this study. Rigor, adequacy, and appropriateness, in a qualitative research study are paramount to any scholarly research and the literature has cited many approaches and ways in which qualitative researchers can achieve this goal (Creswell, 1998; Miles & Huberman, 1994; Rossman & Rallis, 2003; Seidman, 2006).

For example, Creswell (1998) suggests that qualitative studies should use at least two of eight methods of verification procedures to determine rigor and validity; I employed five verification strategies. I used the following verification strategies to increase the standards and rigor of this study (1) In addition to in-depth interviews, which provided

meaningful engagement with each participant, prior to the interview one of my first tasks was to meet in person and interact with each participant in order to build trust, respect, and genuine interest in the study; (2) I also performed classroom observations to establish prolonged engagement;(3) I conducted frequent peer debriefing with critical friends to help provide and maintain objectivity: (4) The frequent and ongoing meaningful meetings and discussions with mentors and with the members of my committee proved invaluable for determining credibility and interpretations of the findings; (5) Finally, I conducted member checks with the participants after interviews to ensure accuracy and credibility of the interpretation.

In-depth Phenomenological Interviews

According to van Manen (1990), phenomenology “is the study of the world as we immediately experience it pre-reflectively rather than as we conceptualize, categorized or reflect on it” (pg 9). The purpose of phenomenological research is to identify phenomena as they are perceived by the participants. The goal of is not to prove that a phenomenon exists but to help understand a situation and the particular context under which it unfolds (Patton, 1990, Seidman, 2006). Patton contends that the understanding gained by the researcher is the goal and not the ability to generalize the findings to predict future behaviors. The research highlights “what it means for the participants to be in that setting, what their lives are like, what’s going on for them, what their meanings are, what the world looks like in that particular setting” (Patton 1990, pg. 7). Therefore the goal of the research was to paint a portrait that might allow others to gain insight into the complexities of teacher development and culturally responsive teaching. In this interpretive qualitative research method of inquiry, I was responsible for data collection

and analysis. This approach allowed me to do a cross analysis of the fine details of each veteran teacher's experience and meaning in his/her everyday social interactions which, provided a composite picture of a) how veteran urban science teachers negotiate the tri-cultural spheres of teacher socialization, b) how the needs and concerns of veteran urban science educators differ based on the relationship between image of self in response to school and local community culture, and c) what strategies do urban veteran science teachers use to gain access and become legitimate participants in the school and local community culture in which they work wider social context of the scientific community.

In-depth phenomenological inquiry is one in which the researcher engages each participant in three separate interviews (Seidman,2006).

The interviews had three different foci; the first focus was the participant's life experiences in the context of the phenomenon being studied, urban science teaching, second, the exploration of the participant's life experiences as they presently exist, and third, the meaning making and responses of the participants to the events and experiences relative to the focus of the study (Seidman, 2006).

The interview protocol used in this study reflected techniques from Creswell (1998) and Seidman (2006). The protocol is best described as a combination of semi-structured and open-ended interviews because some broad sample guideline questions were given to the participants to help them better understand each of the three separate interview themes, and open-ended because for the most part the conversations were driven by the participant's responses. As was recommended by Seidman (2006) and discussed earlier, the three separate interview focuses were: (a) Interview one focused on the

Social/Biographical Context of the participant. The intent of this interview was to find out as much as possible, in light of the topic of interest, about the participant from birth up to the present time. In interview one my goal was to give each participant an opportunity to reconstruct his/her life experiences in the context of the different kinds of interactions within his/her social institutions (such as the family, the school, friends, the neighborhood, and the larger community). (b) Interview two focused on the present experiences in his/her career as an urban science teacher. The critical question answered during this session was, “What is it like to be a veteran urban science teacher?” (c) Interview three had a reflective focus. The reflections on the meanings my participants constructed, i.e. intellectual, social, emotional, spiritual, connections with life, work, and the social reality of his or her world. The critical question was, “How did you negotiate the tri-cultural spheres of teacher socialization in order to establish a successful career as an urban science teacher? This question was not asked directly during interview three, but was answered through a series of questions (see Appendix B)

Teacher Observations

In addition to the in-depth interviews, I also conducted a minimum of three classroom observations for each focus teacher, attended a field trip in which two of the focus teachers’ classes attended, and observed a department meeting.

I attended these events to witness what occurs during the course of a typical day and to gain a clearer understanding of how the participants’ demonstrate culturally connected teaching.

During the classroom observations and field trip I paid attention to the general classroom environment, interactions between students and the teacher, classroom management,

community style, and subject matter content. A conference with the participant followed each observation for the purpose of discussion and clarification of events. During each observation, I wrote field notes that I later analyzed.

Participants Selection

The process for the selection of participants for any qualitative study must be “purposeful” (Creswell, 1998) with “set boundaries” (Miles & Huberman, 1994). In order for the selection to be purposeful, a narrow range of sampling strategies was used. According to Creswell, (1998) the best technique for phenomenological studies is “a narrow range of sampling strategies” because it is of utmost importance that all the participants in the study “meet some criterion” (pp. 118, 119). This principle is central for quality assurance in any qualitative research (Creswell, 1998). Seidman (2006) also recommends that the sampling technique used should be fair to the larger population, both in the selection of the range of the participants and sites from which the participants are selected.

In addition, central to participant selection is that each participant in the study is experiencing the phenomenon. The phenomenological inquiry is the experience of veteran secondary urban science teachers and how they negotiate the tri-cultural spheres of teacher socialization in order to establish successful careers as urban science educators. Therefore, the following criteria were established for each participant; a minimum of five years of successful secondary (grades 6-12) urban science teaching experience, do not live in the community in which he or she teaches, K-12 education was in a public or private suburban or rural setting, and prefers to teach in an urban district.

Teacher Participants

I selected the participants based on recommendations from informal conversations with teachers, administrators, and/or students; about whom they thought were outstanding science teachers. Also, all participants met the above outlined criteria. From their recommendations, I selected four secondary urban science teachers. Three of the teachers currently have Master's Degrees and one has a Bachelor's degree. All four were classified as veteran level teachers with six or more years of urban teaching experience. Additionally, I learned from informal conversations with administrators and the teachers themselves that the students in their classrooms tended to receive higher grades and score higher on standardized state tests.

The participants provided rich narrative that described the essence of their experiences as urban educators. Creswell's and Seidman's (2006) both recommend a maximum of ten participants in data collection for phenomenological genre, which consists primarily of long and engaging interviews. Because this study employs Seidman's (2006) more in-depth form of interviewing which entails not just long engaged interviews but three ninety-minute interviews for each participant, for this reason, I believe four participants is a sufficient number. Through the in-depth interviews, classroom, field trip, and staff meeting observations and member checks, I collected sufficient data; therefore I believe four participants was an adequate number.

It is necessary to establish at an early onset a relationship of equity and trust between each participant and the researcher (Seidman, 2006); it is paramount to this method of inquiry that the site selected for each interview session should be agreed to by the participant and the researcher at their first introductory meeting. During the initial

meeting I recommended to each participant that we meet in a convenient, quiet, and comfortable place, which had a minimal amount of human trafficking, interruptions, or other distractions (Seidman, 2006). My participants were responsible for the place and time selected for all their interview sessions. An introductory meeting was scheduled for each participant prior to the scheduling of the interviews. This meeting served as an icebreaker. At this meeting I reviewed the goals of the research study, the rights of the participant, and the three focus areas of in-depth–phenomenological interviewing (Seidman, 2006) as outlined in the Informed Consent Form. The participants also signed an Informed Consent Form and scheduled the dates, times, and place(s) for all three interviews.

Selection of School Sites

School sites, Wilson High School and Western MA High School (both pseudonyms), were selected based on the demographics of the districts.

Wilson High School is located in a predominantly low-income minority community in Connecticut. The characteristics of the school and the students are typical of a low socioeconomic urban district. There are about 700 students in grades 9-12. Fifty-three percent of students receive free or reduced lunch; the state average is only 27%. The students' ethnicity composition is 89% African American, 6% Hispanic, 4% White, and 1% Asian. The state ethnicity composition is 14% African American, 16% Hispanic, 66% White, and 4% Asian.

In 2008 approximately 40% of grade 10 students at Wilson High School were below the proficiency level in Math, and Science; the state average for both exams was 20% below the proficiency level (greatschool.net). Although these scores seem low, Wilson High

School has made significant gains in the last year to improve standardized scores in all areas.

In 2007 approximately 60% of grade 10 students were below proficiency level in math and science.

Western MA High School is also located in a predominantly low-income minority community in Massachusetts. The characteristics of the school and the students are also typical of a low socioeconomic urban community. There are approximately 1,500 students in grades 9-12. Sixty-six percent of students receive free or reduced lunch; the state average is only 30%. The students' ethnicity composition is 30% African American, 54.4% Hispanic, 12.7% White, and 2.3% Asian. The state ethnicity composition is 8.2% African American, 14.3% Hispanic, 69.9% White, and 5.1% Asian.

In 2008 approximately 62% of grade 10 students at Western MA High School were below the proficiency level in Math, and Science; the state average for Math was 20% below the proficiency level and 45% in Science (greatschool.net).

Researcher Profile

Throughout my doctoral coursework, comprehensive examinations, and professional experiences, I have been investigating culturally responsive pedagogy and the cultural contexts of urban teaching. I am approaching this research project from many different perspectives, as a former urban science teacher and urban K-8 administrator, a woman of color, a product of urban education, and currently the director of the Northeast Alliance of Graduate Education and the Professoriate (NEAGEP) - a program to increase the number of domestic underrepresented minority students receiving doctoral degrees and entering the professoriate in the sciences, technology, engineering, and mathematics (STEM).

All of these perspectives and experiences influence my work. My roles at times may provide me with an insiders' perspective, and a bias of what a culturally connected educator looks like. The frequent and ongoing meaningful meetings and discussions with mentors from the community of practice, and sharing ideas with the members of my committee, prove invaluable for determining credibility and interpretations of the findings. Member checks clarify the participants' stories after interviews and by providing each participant a rough draft of his/her words, phrases, or excerpts as used in the document. This was done to ensure accuracy and credibility of the interpretation and language used to describe what I believe were their accounts of their stories.

Table 1. Data Collection Table

Data Sources	Participants	Timeline	Purpose
Interviews	Four focus veteran urban science teachers	90-120 minute interviews	To examine the life experiences, professional stories, and reflections of veteran urban science teachers.
School Visit and Classroom Observations	Four focus veteran urban science teachers	1 class room observation and 1 school visit (Spent one day at each focus teacher's school)	To gain a better understanding of the school and classroom culture, teacher/student, relationships, support systems, and teaching pedagogy.
Field Notes (Science department staff meetings and field trip)	Four focus veteran urban science teachers	Field notes recorded from two science department staff meetings (meetings were approximately one hour long)	Seek to understand teacher-to-teacher interactions and relationships. Peer mentoring relationships (do teachers support other novices during the induction years)

Data Analysis

My goal was to describe the meaning of the participants' life experiences as they relate to a particular concept or phenomenon, therefore I utilized a phenomenological approach to data analysis. Pre-conceived categories for coding were derived from the research literature and my pilot study on the tri-cultural conflict phenomenon, for example personal, community, and school cultural conflict. In addition to the pre-conceived categories, once I completed all of the data collection I read and reread the transcripts from interviews, field notes, observations and other supporting data to become reacquainted with the information and intuitively identify what was generally interesting and important in answering my research questions. I analyzed the data from a constructivist approach and derived emergent categories from the data. I used Strauss and Corbin's qualitative research guidelines for grounded theory research and constant comparative analysis using open and axial coding to explain patterns that emerge in a particular context (1994). The grounded theory methods focused on the discovery of relationships between and among themes relevant to a particular phenomenon (Strauss & Corbin, 1994). The themes that emerged provided greater insight into the construction of culturally connected teacher identities. A phenomenological approach also demonstrated how the lived experiences of veteran teachers constitute an important body of knowledge that is rarely included in the discourse regarding how veteran urban science teachers move from tri-cultural conflict to tri-cultural connection and become legitimate participants in the school and local community culture in which they work. The themes that emerged among the participants provide greater insight into moving novices from cultural conflict to being culturally connected. It is my contention that

examining the experiences of veteran urban science teachers will present teacher education programs and urban districts with the opportunity to help novice educators combined content knowledge with subjective experiences for a deeper understanding of urban science teaching and strategies to negotiate cultural conflicts.

CHAPTER 4

FINDINGS

I examined the experience of four successful urban science educators teaching in a culture different than their own. Results focus on how the cultural levels of teacher socialization (personal, institutional, and societal) shaped the participants' induction into the teaching profession. Their stories demonstrate the challenges of teaching in an urban setting, and offer suggestions for novice educators who may be experiencing what I have labeled tri-cultural conflict.

Through in-depth phenomenological interviews and observations this research documents the experiences, perceptions, and beliefs of veteran urban science teachers and how they navigated pathways to successful teaching careers. In addition the analysis of the data suggests that teacher preparation programs need to be reconceptualized to include a specific focus on teacher identity development. This restructuring is key for novice urban teachers to either increase their cultural sensitivity, or align their own cultural belief systems in-order to develop the necessary skill set to become successful science teachers in urban districts.

The findings chapter is organized by the research questions. Part one of the findings focuses on how the participants negotiate the tri-cultural spheres of teacher socialization. In part two, I highlight the strategies the participants use to gain access and become legitimate participants in the school community cultures in which they work.

Tri-cultural Conflict

Based on the participants' stories, all of the teachers experienced tri-cultural conflict during their initial years of urban science teaching. The accounts of their novice years, demonstrate the cultural socialization challenges of teaching in an urban setting and their struggles with tri-cultural conflict. Tri-cultural conflict (figure 1) is a clash between ones personal beliefs and value system (culture), with the culture of the institution of employment, and the local community. Thus, for an urban teacher, acculturation into the profession is confounded by a need to also become acculturated to a new set of school and local community values, and in some instances language. Participants' stories reflect if an urban teacher, who is not from or familiar with the community he/she works in, is able to resolve his or her personal cultural conflict they are more likely to stay and establish successful careers in urban districts.

The figure below depicts the tri-cultural conflict phenomenon. Personal culture is illustrated as the largest gear because, for middle class white teachers to appreciate and understand the cultural capital that each student and urban community contributes to the classroom can be a challenge (Morrow & Torres, 1995, Ingersoll, 2001).

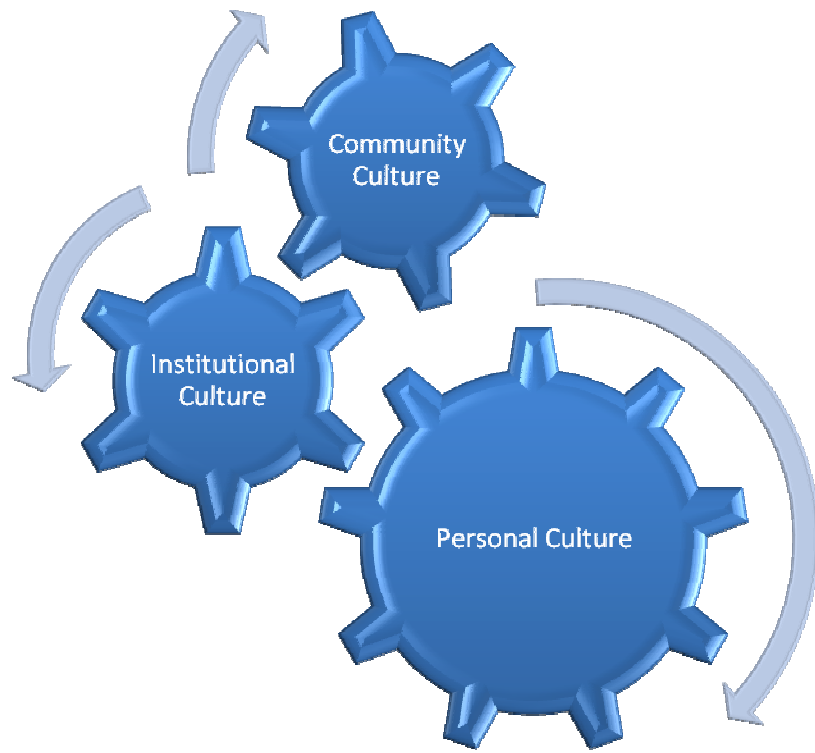


Figure 1: Tri-cultural Conflict

Findings Part I: Tri-Cultural Conflict to Tri-Cultural Connection

In this section I present the accounts of four veteran urban science teachers as they reflect on their initial years of teaching in a culture different than their own and address the primary research question; how do veteran urban science teachers negotiate the tri-cultural spheres of teacher socialization (personal, institutional, and societal) in order to maintain successful careers as urban science teachers? The profile descriptions highlight the process of how the participants negotiated the cultural sphere of teacher socialization in order to establish maintain careers in urban districts.

The following vignettes are the participants' responses to the question "What were your greatest challenges during the initial years of teaching science in an urban district?" The voices of the participants were taken from the interview transcripts. As part of the transcription process, I eliminated fillers that did not add meaning to their response. I have made every attempt to ensure that I represent their perspective as accurately as possible.

Thomas

Thomas is a 39-year-old white male who was raised in a predominantly Portuguese catholic community in a suburban town in Rhode Island. He attended private Catholic schools for grades K-12, received a BS in Biology from Holy Cross College in Worcester, MA, and pursued a graduate degree in plant ecology at the University of Rhode Island. After one year of graduate school, Thomas decided he did not want to pursue an advance degree in science and decided to take a high school biology position in Worcester MA. He stayed in the Worcester MA district for four years and then took a position in an urban district in CT. Thomas has been teaching secondary science for over twelve years, currently he teaches biology and environmental science at Wilson High School. Thomas is committed to cultural relevant and hands-on environmental science education. For example during his time at Wilson High School he created a national renowned farm-to-school program. The program is collaboration between the environmental/agricultural science program and the culinary arts program at Wilson High School. Students in the environmental and agricultural science classes grow crops which are used in the culinary arts classes and the high school food service department. In addition to students growing arugula, cilantro and tomatoes they also grow food like kale, collards greens, and calaloo which are popular vegetables in the African American and Caribbean cultures. Some of the food is the used in the preparation of school lunch and in the fall of 2008 the students in the program prepared a meal at the Governor's mansion for Senator Lieberman. The program has also been featured in a number of newspaper

and magazine articles including Everyday with Rachel Ray, Hartford Courant, The New York Times, Food Management Magazine, and the Edible Nutmeg.

Despite his success as an urban science teacher, Thomas experienced tri-cultural conflict during his initial years of teaching. Due to his limited exposure to diverse groups, there was a racial and cultural incongruence between him and his students. Prior to his teaching position at an urban district, he had no relationship with a person from a cultural background different from his. Therefore during his first year of teaching he not only had to learn to navigate the multiple day to day tasks of teaching but he also had to evaluate and transform his attitudes regarding race, class, and ethnicity. He was conflicted with how to communicate and teach science to diverse urban students.

My first year was challenging. It was hard to balance the curriculum, classroom management, and working with the students. At first I didn't know what to do. I didn't know how to get across them, but it got better by Christmas. Before my first year of teaching I had no friends who were Black or Hispanic. I knew Black people but honestly I didn't know anyone of color who I would hang out with or go to dinner with until I met Eric (African American male). He became a good friend of mine and I think hanging with him helped me relate to the students better.

I didn't grow up in an environment where there were people of color on my street. I didn't have any Spanish or Black kids who were my friends. Even in college and graduate school there were not that many people of color.

My first real encounter with people of color was with my students at my first teaching assignment in Worcester.

Thomas was able to recognize his limited exposure to diverse groups after working in an urban district. He identified his first relationship with a person of color as significant in the development of relating to his students. Due to this positive relationship with Eric, Thomas was encouraged to reevaluate his belief, experiences, and values about diverse

groups. This self-awareness process enabled him to identify the importance of becoming more knowledgeable about his students' cultural backgrounds.

Worcester had a large Hispanic, African American, and International population. I loved the diversity. I think what helped me adapt was who my parents are; they are immigrants and we never had a lot of money and although I grew up around all white people I never felt like I fit in. My family spoke a different language, ate different food, and dressed a little different. In my neighborhood I was the outcast and I think that is part of why I am drawn to working with diverse groups and can relate to my students. I have found that most students are reasonable. I'm not saying I understand or can relate to everything, but if you treat them like young adults they will respond. You have to talk to them and not be afraid to talk to them.

My parents raised me to respect people, and yeah, there were some racist comments every once in a while from my dad, but I was raised to respect everyone despite race.

Thomas was able to focus on how he shared similar cultural experiences with his students instead of only focusing on how they were different. Growing up as a child of immigrant parents, he could relate to not sharing the same cultural values as mainstream society.

Evidence that Thomas was now personally culturally connected was demonstrated in the way he described his current relationship with his students.

I am upfront with them (students). I feel like I can be upfront because I respect them. I tell them you know you have to try hard and do better than the average white student because you are Black. I was surprised when I started working here that the people from the surrounding towns form their opinions of this place from the newspaper and how the students score on standardized tests. This is a rich state and there are upper class neighborhoods in the surrounding areas but people don't want to send their kids here if they can afford to send them somewhere else. So I tell them look around you, what message are you sending. You have to do better because of who you are.

Thomas still struggles with the school culture. Early in his career he adopted the attitude that the efforts of the administration were not genuine. He believes the school is poorly managed and there should be more of an effort placed on the students instead of politics.

To avoid institutional cultural conflict he works with a core group of colleagues with similar institutional cultural beliefs and stays disconnected from the dominant practices of the school community.

I learned early on not to get involved in the politics. I know who to trust around here. There is a revolving door of superintendents and principals. The administration performs smoke and mirror acts. They come here to work and stay a year or two and make claims of increasing tests scores, graduation rates and teacher retention. If you dig deeper you will find there is nowhere to go but up if you are at the bottom.

In addition to struggling with the school culture Thomas is disconnected from the community culture. He has a negative view of the parents and perceives his students' home culture as a setback instead as a resource. When asked about his relationship and interaction with the parents and local community Thomas replied:

There is no parental support here, too many broken homes, too many parents with multiple kids and jobs and they do not have enough time to get involved. We can't change where our students are from but despite what goes on at home it doesn't change the fact that I have high expectations and require respect in my classroom

Despite Thomas' disconnection from the dominant school culture and local community culture he is very satisfied and committed to his career as an urban science teacher.

I wouldn't want to do anything else or work anywhere else. I love teaching these students.

Another participant, Sydney, grew up in a very different environment than her students. She struggled with personal cultural conflict during her first year of teaching and also found that self-reflection, building relationships and openness to diversity were essential to personal cultural socialization.

Sydney

Sydney grew up in upstate New York living a very rural life with her parents, her younger brother, two goats, a dog, two ducks, several chickens, and many cats. She went to only three years of high school before she left for southern France for her senior year as an exchange student. When she came back, she went to Vassar College and got her BA in Biology. Two years after college, she taught environmental education to students from New York City before she moved to Portland, Oregon. Out there, Sydney kept very busy working at a high school and working for an AmeriCorps program. She then returned to the East Coast, got her MS in Environmental Studies with high school biology certification. She has been teaching for six years, this is her third year at Western MA high school.

Sydney is a big advocate of exposing her students to the world outside of their neighborhood. Her experiences as an exchange student in high school lead her to have a great appreciation for other cultures. As a result she regularly incorporated aspects of different cultures in her science lesson plans. For example she taught a lesson on “Is Science Universal?” She had students examine non western cultures perspectives and beliefs about science and the environment. This lesson was a result of the work she did in India. In 2008 Sydney and two other colleagues received the Funds for Teachers grant and spent eight weeks in India. The Funds for Teachers grant provides teachers the opportunity to enrich their personal and professional lives by supporting them as they identify and pursue opportunities around the globe that will have the greatest impact on their practice. During her time in India she researched how globalization impacts the environment, the culture, and the economy. She decided to travel to India to improve her

teaching by challenging herself and gaining first-hand knowledge of how hard it must be for learners with different styles and strengths to adapt in a new, unfamiliar, and challenging place.

Despite Sydney's interest in different cultures, she also experienced tri-cultural conflict during her novice years of teaching. She struggled at first because her expectation of teaching in an urban school was different from reality. School always came easy to her and because of her own experience she initially believed her students' poor behavior and lack of motivation during her first year of teaching was a result of them not being challenged. She learned the reason for her students' poor behavior was primarily due to their lack of confidence and academic preparation.

My first couple years of teaching were difficult you have big dreams and then there is reality. There was a lot of head butting going on in my classroom. I could tell my students wanted something different (better opportunities) I believe they wanted to do well in school and I thought if I pushed them hard enough and showed them I cared they would do well. I thought all they needed was a challenge. Growing up I hated high school because I wasn't challenged and I assumed they were experiencing the same thing. I soon found out my students didn't have the basic skills to do what I was asking. My first year, I learned, I had to teach science, basic reading, writing and math. Getting use to the level the students was hard at first. I expected the best from them and implementing high standards was hard at first.

It was crazy my first year, I experienced a lot of the first year stuff; setting boundaries, being clear, getting through the curriculum, picking my battles and having a thick skin. I had confrontations with kids. There was no help from home or the administration and there were kids who loved me or hated me there was no in-between. I learned quickly the key to success is getting a good reputation by building relationships. I was able to build relationships with some of the toughest students and they told their friends I was cool, and it made my life easier. Building relationships with the students is important. The students here need a reason to do their work. They are not motivated by grades alone. If they have a good relationship with you they will want to try for you. I tell some students "do

the homework for me or try on the test for me”. Most of them don’t want to disappoint me.

Sydney was able to negotiate personal conflict by reflecting on her own experiences and identifying ways to connect with her students. She maintained her values of having high expectations, but she discovered she could not have high expectations without caring relationships first.

I learned that children from poor urban environments often come to school with a lot of frustration about things in their personal lives. I think that it is important to understand that when students lash out about something, not to take it personally, and to try to get students to open up about their problems. Often having private conversations can help to calm a student and show that I care and I’m concerned about whatever is troubling them. Maybe I can offer some suggestions, or point them to a school counselor or someone else who can help.

She also learned to embrace her student’s culture of relationship building as an essential factor of teaching but unfortunately she was unable to develop those same relationships with the parents, administration, and community members. Instead of viewing these individuals as support networks she removed herself from these communities and channeled her efforts towards developing a strong classroom community.

The students can be rough; this year I watched a new teacher leave in March because she could not take the abuse from the students and there was no one to help her. I understand what she was going through; I had some very low points my first year. It was hard to adjust to a new environment. I am not from the area and I moved here alone. My first year I lived here but I moved after a year. Work was draining; I needed a separation between work and home. I felt so overwhelmed by the job and living in the same place I worked. I felt like I couldn’t escape my job. I know it is important for the students to see you outside of school in the community but I just wasn’t happy living here. I am a better teacher now that I live twenty miles away.

Even though Sydney understands the importance of being involved in the community where her students live, she believes she is a better teacher for not living there. Not living in the community allows her to separate work from her personal life.

Another participant Janet also struggled with tri-cultural conflict in the novice years of her teaching career. She negotiated the cultural spheres of teaching socialization through relationship building and developing a strong learning community within her classroom.

Janet

Janet is a 30-year-old white female who was raised on a 150-acre farm in a small rural Connecticut town with a population of less than 6,000 people. She is from a close-knit family; all of her immediate family members still live in the town where she was born and raised. She has worked on a farm as long as she can remember and she received her bachelor's and master's degree in agricultural science education from the University of Connecticut. Janet currently teaches animal science and general science at Wilson High School.

She is a big advocate of hands-on science education and developing learning communities in her classes. She starts each year with having her classes take part in an overnight field trip with Project Oceanology at the University of Connecticut's Avery Point campus. Students participate in a two day one night learning experience focusing on team building through problem solving. The trip is funded by grants and donations. Janet believes this activity is helpful in developing learning communities and students take her class because of this unique opportunity. Despite her current popularity as a teacher at Wilson High, Janet experienced tri-cultural conflict in her novice years of teaching.

I have been teaching for six years. I can't say I loved it at first, but now I love my job. My first couple years of teaching were difficult, but I stuck with it because I was taught to always give things a chance. The most difficult challenge my first year was getting use to the culture. Everything was different; I had to learn about a new group of students. My first couple years here the students challenged me. I had trouble with classroom management and I relied on colleagues for help on what to do. I eventually learned the best classroom management is building relationships and earning the students' respect. There is no one size fits all. You have to treat the students as individuals and be open to let them teach you. I am not saying I don't have problems now, but I do have students tell me this is their favorite class.

Janet was very aware of her personal cultural conflict. She was able to articulate that one of her greatest challenges as a novice urban educator was adapting to the culture. Her unfamiliarity with the culture of the students led to problems with classroom management and teaching. Janet relied heavily on her colleagues to advisor her on what were effective ways to communicate and work with diverse urban youth. Like the other participants, Janet found that building relationship was crucial to be an effective urban science teaching. In addition, Janet had to take a true assessment of her own personal culture and how her experiences and values impacted her teaching. Because of her ability to recognize the negative values and beliefs of her personal culture Janet was able to be aware of the problem and start to develop relationships with her students from diverse backgrounds. Her understanding of the importance for everyone to interact with diverse groups is demonstrated in her efforts to introduce her niece to cultures and people outside of her comfort zone.

I grew up in a small town and my first interaction with people from other races and cultures was in college and it was limited there. My student teaching was at the high school I attended. I worked with my old agriculture teacher. I knew most of the staff and I was familiar with how to work with that type of student; the experience did not prepare me for my own classroom. The students I worked with during my student teaching were very snotty and I didn't enjoy working with them and I knew I didn't want to stay at that school.

I still live in the same town and I have been offered jobs at my old high school but I have no desire to leave. Despite my forty-five minute commute each day I love working here.

There is very little diversity in the town I live in, and some of my family members are very racist. My brother still makes comments about me working here. I don't condone his beliefs but I understand why he acts this way. His exposure to different people is limited and he buys into negative stereotypes. Some of his beliefs have spread to my niece, so whenever I get the opportunity I bring her to activities at the school. I think it is important to expose her to different cultures. I don't want her growing up afraid of different people. One year I was junior class advisor and I took her to the prom and the junior class trip, she really enjoyed it.

When I began teaching I had a strong tendency to gravitate toward the students who looked like me. The students were very intuitive and could tell right away I did not treat them the same as the White students. I now make it a point to treat all students the same, regardless of ethnic backgrounds.

When asked about the limitations and on going challenges of teaching in an urban district, Janet talked about the lack of parental support.

The parents just aren't involved. It is hard not living around here, but I try to go out of my way to call and contact parents. I know it's hard for them to be involved because they have to work, but if there was more parental support we could teach more instead of parent.

Janet is aware of some of constraints of the parents' involvement with the students but instead of tackling the problem with possible solutions for greater opportunities for more parental involvement she remains distant.

The fourth participant Chloe started her teaching career later in life. She worked in industry for over ten years and decided to go into teaching after having children. She also had no experience or exposure to working in urban communities and therefore struggled with the transition.

Chloe

Chloe is from Northern Maine, where she grew up speaking French, picking potatoes, and watching moose. She proceeded to study Chemical Engineering at MIT. She moved on to a fast paced career in industry. After having her first child she became a stay at home mom. During this time she volunteered with PTO and School Council, moving on to being elected to the School Committee. She also volunteered in the classroom, doing everything from copying classroom materials to teaching math concepts to small groups of sixth graders. She was hooked and decided to pursue her teaching certificate in secondary chemistry, which she received in 2003. She began her formal teaching the following year at Western MA High School.

Chloe is a career changer and worked in very structured corporate working atmosphere. Her personal culture was based on measurable goals and she structures her teaching around analysis. In 2008 Chloe was recognized by the school for her dedicated work as a Massachusetts Comprehensive Assessment System (MCAS) leader. She created individual educational plans for each of her students based on summative, formative, and previous MCAS assessments.

Like Janet she also described her first year of teaching as working in a completely different culture. The culture of corporate America was based on measurable goals. She was not familiar with the culture of an urban school district.

I was hired on a Friday and I had to start work on that following Monday. I got very little support from the administration or other teachers. I think there is high turnover here because of the lack of support. I believe all teachers want to get better at what they do. My first year, I had one visit/observation from administration. The only feedback I received (from the observation) was “your room is not teachery” I didn’t even know what that meant. I was a first year teacher and I only had one observation and

no one ever bothered to check on how or what I was doing. I'm assuming like many other teachers, my first year was a disaster. I had no clue what I was doing and this is very different from volunteering at my children's school. I was not prepared. It was a completely new culture.

What helped Chloe initially was creating her own measurable daily goals. At the end of each class she would quiz students either verbally or through writing journal entries on what they have learned for the day.

What got me through is I kept telling myself, I want them to leave class everyday having learned something and if they leave without learning something, I haven't done my job. They can't use excuses and neither can I. Teaching kids inspires me.

During Chloe's classes, the students are alert and look forward to learning the fact or concept of the day. Her relationship with her students is very professional but at the same time caring. She believes they all have the capability to attend the top colleges and universities and works hard to get them there.

My goal for these students is to be able to compete with any students from the top districts and to get into any college or program they desire. I tell them there is no difference between you and them (suburban white students), in the end you are all taking the same SAT exam, competing for the same scholarship dollars and college admission slots. I want them to be prepared despite their circumstances.

Like the other teachers in the study Chloe had poor relationships with the local community and the parents' of her students.

As a teacher, I try to contact students' parents or guardian if they are having behavioral or academic problems. Most parents say they are going to help out and talk to their child. Often there is no change or it is short lived. Parents and community members are more of a distraction than any else. Earlier this year there were two fights in front of the school; one fight was between two parents and the other one was between two adults from the community. These people are poor role models for the students.

Chloe's language about the parents and community was negative. She refers to them as a distraction. She also creates a distinction between herself the parents and the community. She doesn't see the positive aspects of becoming involved with the community where she works.

Findings Part I: Data Analysis

These stories suggest that the negotiation of personal and institutional cultural conflict involve: a celebration of diversity, a strong sense of self with openness to self reflection, an understanding of the influence positive student teacher and colleague relationships, disconnect from the dominant institutional culture, and a focus on culturally relevant and responsive pedagogy. (Figure 2)

Unfortunately, the participants did not see the value of developing strategies to negotiate community cultural conflict. They had no desire to live or be part of the local community and continued to have conflict in this area. They managed to be successful urban science teachers without finding ways to negotiate community cultural conflict.

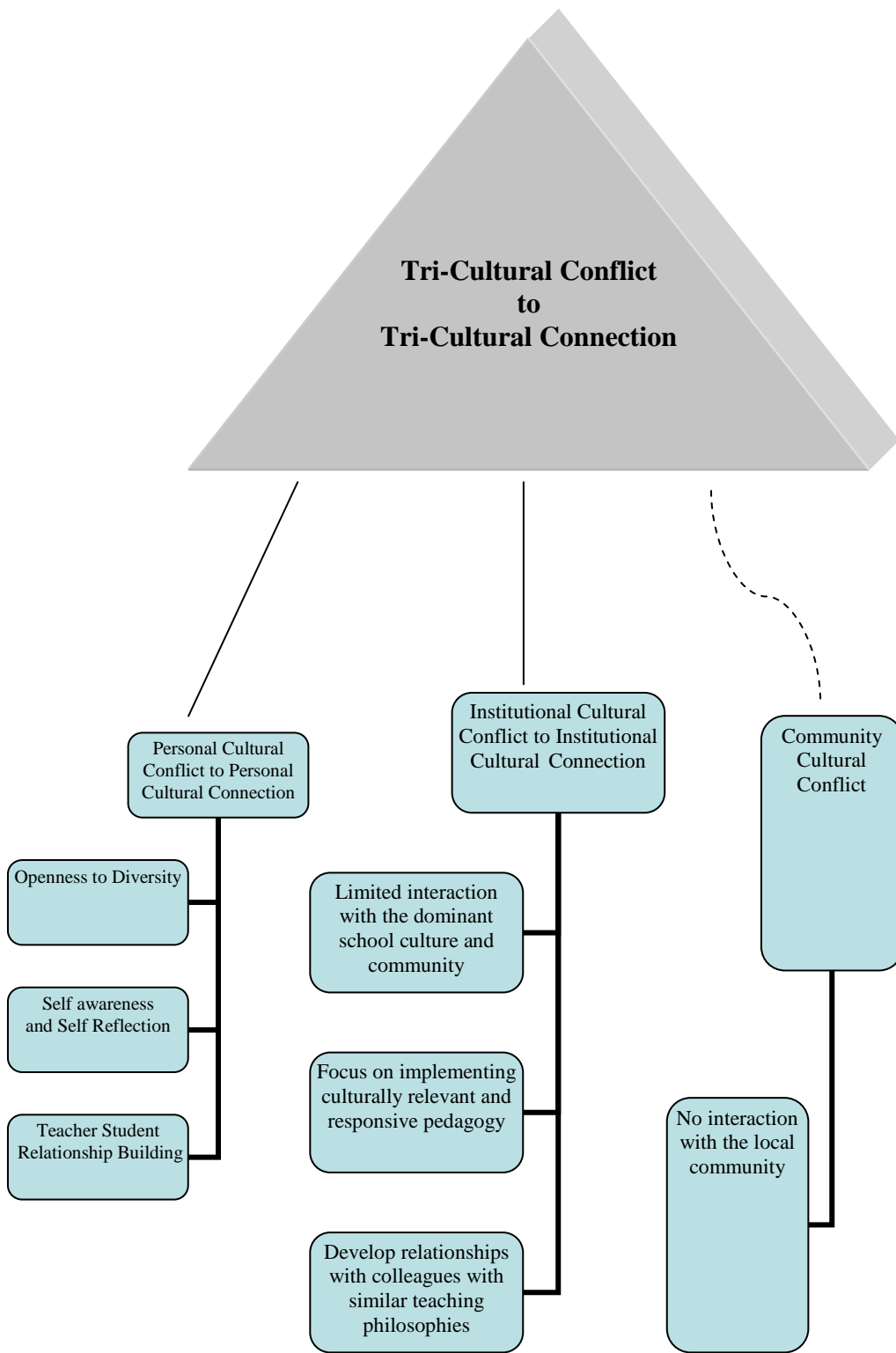


Figure 2. Tri-Cultural Conflict to Tri-Cultural Connection

Personal Cultural Connection

Personal cultural conflict to personal connection emerged as the most significant in the transition from tri-cultural conflict to tri-cultural connection. Based on the participants' interviews there were key events and indicators which helped the teachers' transition from personal cultural conflict to personal connection. The three primary dispositional factors for negotiating the personal cultural sphere of teaching were: 1) openness to diversity, 2) self-awareness and self-reflection, and 3) relationships building.

Openness to Diversity

Urban districts reflect great variations in culture. All of the participants were born, raised, and educated in predominantly white rural or suburban communities. Their exposure to racial and ethnic diverse groups was limited and their first true interaction was during their first year of teaching. Their lack of contact with different cultures left them at a disadvantage for working in an urban district.

Their openness to gain an understanding of a new culture, helped them adapt to working in this context and learn to teach and build relationships with diverse communities.

Self awareness/Self reflection

Although the participants were never introduced to the concept of tri-cultural conflict, when asked about challenges as urban novice teachers, each described their struggle with aligning their own personal culture with the culture of their students as being one of their greatest obstacles. Two of the participants, Janet and Chloe specifically described their challenge as a problem adjusting to a new culture. Additionally, each participant also seemed very aware of how their limited interactions with diverse groups and their prior beliefs, values and background experiences with diverse groups impacted

their novice years. They were all able to identify and challenge prior beliefs and values which may have impacted their success as urban educators. For example, Janet and Thomas talked about racist family members and having to deviate from their beliefs in order to adapt to a new culture.

Evaluating and challenging prior beliefs, values and experiences seems to be a key component for moving from tri-cultural conflict to tri-cultural connection.

Building Relationships

Developing a mutually respectful relationship with students was imperative to the transition from personal conflict to personal cultural connection. Recognizing the differences between them and their students, responding as a listener, and designing instructional activities that reflect students' needs are critical to developing a positive teacher student relationship and a productive classroom learning environment

"You're there to teach kids--not subject" This response from Chloe, demonstrates a critical aspect of her philosophy of teaching building relationships with students. All of the participants emphasized the importance of initiating and cultivating positive relationships with their students. "I try to get to know as many kids as possible on a personal level. So when I see them in the hall, I can ask about their lives outside of school (Janet). All of the teachers interviewed described actions that demonstrated genuine care for students. The development of trusting and respectful relationships allowed them to achieve a better relationship with their students and develop a cultural connection.

Institutional Cultural Connection

The participants negotiated institutional cultural conflict by implementing the following strategies; creating a cultural disconnect from the dominant school culture, creating a

culturally relevant and responsive pedagogy, and developing relationships with colleagues with similar teaching philosophies. The teachers had limited or no interaction with the dominant school community. They focused on creating positive classroom communities and developed relationships with colleagues with similar teaching philosophies. By creating an institutional cultural disconnect the participants were able to avoid or reduce institutional cultural conflict and focus on implementing culturally relevant and responsive pedagogies. Part II of the findings goes into more detail about how the participants used culturally relevant and responsive pedagogies.

Community Culture Conflict

Community cultural conflict remained a struggle for all of the participants. Although the educators in the study were open and receptive to making things work in urban multicultural classrooms, they lacked the experience of knowing how to personally interact and communicate with the local community outside of the school setting. Given that none of the participants lived in the community they worked in, except their involvement as teachers during the school day, they had no interaction with the local community members or parents; therefore community culture remains a problem. The teachers adopted the theory of don't expect help or support. They took on the sole responsibility of educating their students.

Findings Part II: The Habits of Effective Culturally Connected Urban Science

Teachers

In this section I address the second research question and highlight the pedagogical strategies teachers use to gain access and become legitimate participants in the school community culture in which they work.

All four teachers believed that it was important to develop more culturally relevant and responsive pedagogy in order to provide more equitable learning opportunities for their minority students. Culturally responsive pedagogy is more about responding to the individual learning needs of the students, while culturally relevant pedagogy speaks to the use of appropriate curriculum. (See chapter 2, pages 33-37 for more detailed definitions of culturally relevant and responsive pedagogy). All four teachers believed that if concepts were presented and explained according to the learning styles of their culturally diverse students, comprehension would increase.

Although all of the participants were successful veteran urban science teachers, their teaching styles were very different from each other. For example Thomas' and Chloe's styles were very structured and regimented using daily routines and activities. Chloe required her students to keep a scientific notebook to record observations and laboratory procedures and Thomas posted a daily agenda for class. Janet and Sydney were more unstructured and learning seemed to emerge from student initiation. Sydney liked to start with a question or news article to discuss and some days spent the entire period on that one item. Janet brought her golden Labrador retriever dog to work everyday and she allows the student to visit with the dog at the beginning of class. There were no common threads to pull from their teaching practice, which initially made it difficult to identify

successful classroom teaching strategies of the participants. However, when I went back over the data, I could see that in order to understand their practice and their transition from institutional cultural conflict to institutional cultural connection, it was necessary to go beyond their day to day teaching practices and look at their philosophy and ideological of their practice (Ladson-Billings, 1995). Despite their different teaching methods the common theme was their teaching philosophy was based in culturally responsive and relevant pedagogy. They were able to link the science content to their students' experiences, incorporate social justice issues, and empower their students to become productive citizens in and out of the classroom.

The Habits of Effective Culturally Connected Urban Science Teachers

The findings discussed here are not presented with the intention of offering a rigid rubric for good urban science teaching. Rather, they were created to offer various perspectives to help inform the creation of teacher identities that are culturally connected, influence teaching practices, and allow teachers to effectively work in urban school cultures. The findings presented in this section address commonalties among the teachers in the study. The following are descriptions of some of the strategies teachers use to implement culturally relevant and responsive pedagogy. The following strategies are organized into three categories 1) integrating social justice into science education 2) stress hard as well as soft skills and 3) create a classroom culture of achievement.

Integrating Social Justice into Science Education- Culturally Relevant Pedagogy

The participants found ways to engage students in the learning process by integrating social justice and transforming the curriculum to make it culturally responsive. The study of social justice education is a look at inequities that people experience on the basis of

their social group memberships, through systems of constraint and advantage reproduced through the social processes of exploitation, marginalization, powerlessness, cultural imperialism, and violence (Young, 1990). Social justice education pays attention to the resources that individuals, families, and communities bring to personal and social change and to the transformation of educational institutions and practices. The participants emphasized the importance of empowering their students through science education. Although the teachers cannot change the culture into which they were born and raised, they understand the importance of gaining a better understanding of their own culture, those of their students, and the historical relationship between the two. (Delpit,1995). Topics such as race, socioeconomic class, and gender were discussed and used to tear down the barriers that separate and label urban students.

Sydney: Observing the poor people in India caused me to be more aware of the poor people and social injustices in the United States. Since science was so easy for me, I thought that it would be a great opportunity for me to use my knowledge to make science easy for kids who don't think that they can do science, like low achieving urban minority students. I wanted to show that any student could do science, because I never had any special guidance and I could do science. All that I had going for me was my belief in myself. If I could train students to believe in themselves, believe in their potentials, I could get any student to do well in science.

Thomas: I'm not a big advocate of having my students memorize applied science facts. I think it is important to bring social justice into the curriculum. I like to embed the facts in lessons that relate to students' real world. Whenever possible, I help students see how science impacts their world. For example when I cover mitosis, I discuss designer babies, human cloning/testing and the social implications of these procedures in a world with institutional racism.

Because of my love for science, I spend considerable time making my lesson plans more relevant and interesting. Almost every evening, I read science magazines and journals as I eat dinner, looking for interesting ways to present science to my students. I am always looking for new approaches to make my lesson plans more relevant and meaningful. When I finish with my readings, I go online to research interesting new approaches to present my lesson plans. I like to

challenge my students with the latest scientific concepts. I constantly invite my professional friends and professionals that I meet at local conferences to come and give presentations to my students. I especially seek out women and minorities. I think it's important for them to see the real world application of the topics we are studying.

While curriculum design and implementation are a standard part of urban school districts and departments, culturally connected teachers transform existing curricula to address issues of social justice without sacrificing teaching the skills outlined by the state and local polices. Teachers in the study openly shared their desire to address topics of importance to their students' lives, and integrating the way status characteristics like race, socioeconomic class, and gender impact aspects of science. Integrating social justice in science allowed the students to connect to the curriculum content in a meaningful way. The participants saw their overall goal as being able to help students become leaders by preparing them for college, successful careers, and a lifetime of informed choices.

Janet: I try to connect with the community often. I design projects that expose them to community leaders and get them to identify and solve scientific problems in their world. Last year one of my students wrote a report on the poor energy design of local schools. She did energy audits at four schools and made recommendations based on the data. The recommendations were given to the administrators, and the news paper did a story on her project. Hopefully changes will be made based on her report. She was so proud of her work and she was excited about doing science.

In addition to these examples, I attended Chloe and Sydney's Connecticut River Watershed Symposium. The symposium was collaboration between Western MA high school and a local rural charter school.

Chloe: I have the students work on a community science project each year. This year the focus was the Connecticut River Watershed. Each group was given a research question related to the water quality of the CT river. Both groups collected data on the water quality of the river and presented their results at the symposium. My primary reason for collaborating with rural and suburban schools

is I want my students to see they are just as or more intelligent than these kids and they are doing the same caliber of work

I try to involve all students in community based activities. It is critical that students are genuinely involved in all classroom activities. It is important to motivate students' thinking and learning and I think projects are the best venue to engage students. In an urban environment, scaffolding and trying to make connections to ensure the lesson is relevant and meaningful is very important. When students are given procedures for lesson plans, I often spend a lot of time discussing the vocabulary and scientific terminology. I define words used in the lesson plan. I want to make sure that students from different racial backgrounds have the correct understanding of the concepts. I post vocabulary words with definitions all over the classroom for each lesson. I know that vocabulary is an important part of state testing and the vocabulary can be culturally bias. I want to expose them to as much as possible.

All the projects mentioned above involve a community and social justice component. The teachers understand science holds a uniquely powerful place in society. It opens doors to high paying professions and it provides a knowledge base for more informed conversations. Our society has a history of hierarchical relationships between those who know science and those who don't (Gay, 1992). Thus science education is political and science knowledge promotes particular images of power and intelligence. In Freire's Pedagogy of the Oppressed and in his later texts (1993, 1996, 1997, 1998) he states that education, at its core must be about working with people to tear down the barriers that separate, sort, and label individuals and social groups hierarchically based on their social cultural and economic backgrounds.

Through the integration of science content with social justice education these educators were able to challenge their students academically and empower students to become more socially just.

Along with social justice education the participants stressed the importance of teaching soft as well as hard skills to help prepare student academically and socially

Stress hard skills as well as soft skills-Culturally Responsive Pedagogy

The culturally relevant urban science teachers taught their students not just science content but how to act according to what are commonly traditional, middle-class values of being successful in school; one of the participants called this teaching soft skills. Soft skills, such as helping students build confidence, learn appropriate behavior, defeat their fears and learn the unspoken rules of being successful in school the community.

Chloe: Having had many experiences working on departmental team projects in the business world, I know the importance of understanding how to effectively work on group projects. I think that it is very valuable process to teach to students. I believe that learning how to work on group projects is very good preparation for college and the jobs that await students.

Janet: Last year 80% of my 10th graders passed the science portion of the Massachusetts Comprehensive Assessment Exam (MCAS). I think it's a result of stressing hard skills as well as soft skills. I get to know my students well. Building relationships is important. I know what they struggle with academically and socially. I teach them how to build a safe learning environment. We have a lot of conversations about what is getting in the way of their learning and how they can avoid those obstacles. We also talk about the importance of cooperative leaning, peer learning, and time management. I don't think that occurs in most schools never mind urban schools.

These teachers engage in explicit character building aimed at creating a culture of kindness, decency, integrity and hard work. They just don't mouth vague instructions like "be kind" and "work hard"; they translate abstract goals into concrete benchmarks and rules, check constantly to see how everyone is measuring up — and intervene whenever necessary. For example, each year Thomas has a Power of Agriculture seminar series in his environmental science class. He invites science professional from the local area to give a talk about their career and how it relates to the material they are covering in class.

Students are evaluated in two ways for the assignment, a paper summarizing the talk (hard skills) and participation and etiquette during the talk (soft skills). The students are given a list of seminar etiquette expectations which include; arriving on time, be attentive during the seminar, research the speaker prior to the presentation, ask questions, take notes, dress neat and clean, introduce yourself and thank the presenter.

Thomas: I include a professional seminar series each year because I want to teach them that seminars are a part of professional life. Whether they become research scientist, physicians, college professors or a CEO of a company, professionals use seminars to disseminate information and exchange ideas. I believe it is important to cultivate the habit of attending seminars early in your academic career. It is also a good way to teach proper etiquette.

I have three objectives for the monthly seminars; first to introduce the students to a board spectrum of the science being done in the field of environmental science and its related industries, second to stimulate students to think creatively by exposing them to current scientific research processes, ideas and results, and last to teach proper etiquette for professional venues

The teachers acknowledge the multiple influences on the lives of their students and adjust their teaching based on that knowledge.

The school culture can also sometimes be at odds with a student's home environment and community, particularly in families where no adult speaks English or has graduated from high school, much less attended college. As a result, those students who tend to be successful in school have values the school deems appropriate. However, those students who fail to assimilate or culture switch to the dominant culture of school are at a greater risk for failing (Irvine, 1990, 2003). Therefore, the participants' felt one of their chief roles was to help steer their students in the right direction. Chloe stated, "I believe the down fall of urban education is disorder, not violence or poverty". That is why they devote inordinate attention to making sure that shirts are tucked in, students speak

politely, are on time for class, trash is picked up, and students are trained to ask questions and how to engage in intellectual conversations. At first glance, the character training and rituals of these urban educators have a very traditional feel. Simply put, these teachers stress old-fashioned virtues. They presume that young people who grow up in poor neighborhoods, surrounded by street culture, may well embrace middle-class values in theory but will often fail to learn these values in urban schools, so they show their students exactly what it means to “behave accordingly”. Despite the sometimes chaotic culture of the urban schools the participants are not conflicted because they create an environment counter to the dominant school culture.

When asked why it is important to teach character skills Janet replied:

Janet: No student can openly bring a gun, other weapons, or drugs to school or assault a teacher without getting expelled or suspended. But teachers and the principals have pretty much abandoned any serious effort to teach character or reinforce appropriate behavior. Students get away with using street language in class rather than proper English. Being tardy, calling out in class out-of-turn, swearing, drifting off task, teasing other students, failing to turn in homework, turning on an iPod, chatting or texting on a cell phone, or talking disrespectfully to other students rarely brings serious or consistent consequences. When teachers do punish students for acting disruptive or failing to do their work, the consequences for misbehavior differ from teacher to teacher. Before long, they realize that the school’s code of conduct is not really a code after all. So I make it a point to teach what appropriate behavior. It is just as important as the science content.

Much in the manner of a responsible parent, these teachers go beyond the curriculum and teach students to value freedom, curiosity, and self-expression, but not at the expense of politeness and a strong work ethic. These teachers go beyond just teaching values as abstractions; they tell students exactly how they are expected to behave and their behavior is closely monitored, with real rewards for compliance and penalties for noncompliance.

The last significant trait I recognized was the participants' ability to create an ethos of achievement.

Create an Ethos of Achievement-Culturally Responsive Pedagogy

The participants challenged their students to assume an ethos of achievement and overcome their personal limitations to achieve. These teachers demanded, reinforced and produced academic excellence in their students. They created a classroom environment that fostered achievement. Despite their students' gaps in opportunities and or academic preparation, they spoke about the significance of convincing their students that they all are intelligent. These teachers created an ethos of achievement through motivating, challenging, and encouraging all of their students to do well in science.

The teachers in the study gave what Bluestein (2000) and Brown (2004) referred to as giving positive regard. They gave students verbal as well as non-verbal affirmations and compliments on their classroom activities and homework, which built self-efficacy, convinced students of their abilities.

Within these classrooms it was important that role modeling, self confidence building, and a sense of belonging be provided.

Sydney: My biggest struggle is to get my students to have confidence and to embrace the concept there are no limits. It's one of my biggest problems because you can't teach confidence. What I do is support them and give them multiple chances in a variety of ways to meet the target so their confidence does grow and they can perform at their full potential. I know I am doing something right because I can see their growth. They are eventually able to intelligently articulate their goals and participate in science

For Thomas, the ethos of achievement extended beyond his classroom. He believed in preparing students to always have an attitude and character of excellence.

Thomas: One out of four students who enters college will graduate, and my goal is to teach these kids how to get in and out of college I tell them below a C is not going to cut it. You can't go to college with Ds. The message I tell them is reaching the minimum will only get you the minimum. We have conversations about institutionalized racism and the soft bigotry of low expectations and it's really touching and powerful that kids, at such a young age, understand these issues. For my students this is part of their world. A lot of my students, especially the young black males talk about how people react to them. This one student told me, I'm sick of old white ladies looking at me in the store when I'm just their buying a soda.

The students want us to hold them to high expectations. In many ways the system has failed them. It is amazing to see the transformation.

Even though the participants do not agree with the culture of the school, they find comfort in creating a safe empowering culture to help build confidence and dispel negative stereotypes.

Janet: My primary task is to help students overcome their fears and discover they can do more than they think they can I think my teaching philosophy is pretty simple; I want them to be successful. There are a lot of people here who don't challenge them and don't expect much from them.

It is the philosophy of people here that they (students) are going to be mediocre. Teachers and administration make a big deal if students do the basic requirements. We can no longer get away with this, the stakes are too high

Based on their in-depth interviews and classroom observations it was evident these teachers believed in their students. They were motivated to develop their strategies through their own self-efficacy, through a desire and a belief that they could make a difference in providing equity in learning in their classrooms. They actively and intentionally developed pedagogical practices that led to the transformation of educational outcomes. For example by the end of the school year Sydney's and Chloe's students felt comfortable participating in a science symposium.

Chloe: I have fun with my students, I tell them that I am giving them harder work to do, but I know that they can do it. When they accomplish difficult tasks with

ease, I tease them by saying that I made the difficult things too easy because everyone got A's and B's on the assignments.

By establishing personal relationships through culturally responsive communication, and getting students to face and overcome their fears, the participants were ensuring that their students are prepared to realize extraordinary professional science opportunities. Also a culture of achievement prepares urban students to live and act more fully in the world outside the classroom (hooks, 1989), by gently guiding them into learning the rules of the dominant society.

Focusing on integrating social justice into science, stressing soft and hard skills and creating a classroom culture of achievement allowed the participants to overcome the sometimes negative urban school culture. They learned not to let their cultural surrounding shape their perceptions of their students or their abilities.

Findings Part II: Discussion

Urban districts reflect great variation in culture, ethnicity, social, emotional and socioeconomic conditions. The findings suggest that for novice urban teachers, attempting to negotiate tri-cultural conflict and meet the needs of urban students involves a delicate balancing act. This balancing act requires urban educators to develop awareness and explicitly respond to their students' ethnic, social, community, emotional and cognitive cultural characteristics in comparison to their own. For the four teachers in this study the transition from cultural conflict to cultural connection is an ongoing process.

Despite community cultural conflict, these teachers managed to show genuine interest in each student, create effective classroom communities by focusing on culturally relevant and responsive pedagogy, and develop nationally recognized secondary science programs. They gained student cooperation by being assertive through the use of explicitly stated expectations, teaching appropriate student behavior, and promoting academic growth through empowering students to defy social injustice in classroom and society. On the surface they seem like successful teachers in poor urban communities. However, are the participants truly culturally connected? What impact does their disconnect from the dominant institutional and community culture have on their career development and their students. What message are these teachers sending by not drawing on the cultural strengths of their students' community? Can these teachers be successful and culturally connected if they do not recognize who their students are?

Partially Culturally Connected

Researchers like Ladson-Billings, Haberman, and Delpit contend that successful culturally connected urban teachers are part of and understand their students' cultural community, a community defined by institutions, beliefs and familial relationships. Student life experience must be legitimized as part of the curriculum. "A teacher can not achieve any of the other goals he establishes if they reject who the students are" (Ladson-Billings, 2000). These researchers suggest that it is not enough for teachers to have the courage and the empathy to deal with tough situations from 7am-3pm; the motivation has to be something deeper. Parents and the community have to be involved. Gone are the days where teachers come from the same community as students and families. Now schools and educators have to develop those relationships intentionally. Dealing with parents many times is just as hard if not harder than dealing with students but teachers must involve parents and community. The lack of community cultural connection resulted in the teachers blaming parents that look nothing like them, talk nothing like them, live nothing like them for the ills of urban education. The parents and the community become the ones with the problem, with the bad attitude, with the messed up culture and the wrong skills if they changed everything would be fixed. The parents want the best for their children just like the teachers; both groups are working towards a common goal.

I believe the findings reflect the important problem of urban teachers not being aware of the significance of being culturally connected to the community. These teachers have managed to be satisfied with being partially culturally connected. How can teacher

education programs and urban districts place more emphasis on the cultural capital of the parents and the community? The following chapter addresses how urban district and teacher education programs can better prepare and meet the needs of urban educators.

CHAPTER 5

IMPLICATIONS

“In the end we will conserve only what we love. We will love only what we understand. We will understand only what we are taught” Baba Dioum

“As America grows more culturally diverse, so does the need for a more qualified, diverse and culturally skilled teacher workforce” (Darling-Hammond 1994, p185). The cultural education of novice educators is not a priority in all teacher preparation programs and is not seen as crucial during the induction process at urban schools. All too often, when teachers are hired for positions in urban districts they do not have realistic views of the community, the district, and the students. These unresolved feelings and ideas can lead to tri-cultural conflict.

The voices of the teachers in the study suggest that preparation programs should expand their scope to address fostering the development of negotiating the cultural spheres of teacher socialization. As they are currently designed, teacher preparation programs place significant emphasis on content knowledge, curriculum development, and pedagogy; there is very little directed at cultural identity. The new version should include personal identity development, raising critical consciousness by integrating culturally relevant and responsive pedagogy and developing meaningful community networks and connections. Placing more emphasis in these areas will help teachers develop cultural connections.

Personal Identity Development

Teacher preparation programs and urban districts need to consider placing more emphasis on helping urban teachers develop cultural connected identities, like those expressed by the participants in the study. There needs to be a safe environment for pre-service and novice teachers to evaluate how their experiences or lack of experiences will impact their teaching in diverse communities. Teacher educators and pre-service teachers have to be willing to reveal their sometimes uncomfortable beliefs about race, class and injustice. Once these values and cultural beliefs are identified, teachers will be aware of what areas they need to build upon to become successful urban educators.

Raising Critical Consciousness

Prospective teachers' beliefs have a great impact on their attitudes and behaviors towards culturally different students; therefore teacher educators need to make beliefs an important feature of preparation programs and legitimate sources of inquiry (Sia & Mosher, 1994). Courses in social foundations provide opportunities for such examinations and can scaffold teacher candidates from their own experiences and belief system to complex understandings of educational access and equity.

Teacher candidates need to be familiar with the critical discourses of social foundations, examining the historical and sociological aspects of education, to heighten their awareness of their socialization and foster an understanding of how instructional methods are shaped by these forces (Gold, 1996). Teacher education can sometimes be a series of isolated courses rather than a program reflecting the integrated nature of teaching, lacking explicit connections between the social contexts of schooling, the actual content taught,

and the methods used to teach that content (Irvine & Fraser, 1998). Social foundations courses can provide an integrated experience where content is wedded to the practice of teaching in such a way that students can see how individual and social issues have real implications for everyday pedagogical practice (Delpit, 1995).

Through historical and sociological inquiries into education, teacher candidates have the opportunity to raise their awareness of past and current social inequities and the role of schools and teachers in perpetuating and resisting them (Darling-Hammond, 2002).

“While teacher candidates may assume access to universal public schooling is a given, courses in the social foundations allow them to examine the gradual and often times reluctant move toward this reality by focusing on the evolution of public schooling and the educational experiences of diverse groups at various points in the history of the United States” (Grant & Secada, 1990, p.420). Teacher candidates begin to distinguish between historical and contemporary perspectives on access to schooling and come to understand the efforts that led to wider educational access and the challenges that remain in providing educational equity for all.

These types of understandings are critical in preparing teacher candidates to practice culturally relevant pedagogy and begin to address the long-standing crisis of achievement for students of color and those in poverty, especially in the area of science.

Teacher preparation curricula should address issues of urban education, cultural diversity, and social justice. As they are currently structured, many teacher preparation programs are very credit intensive to meet state requirements. As a result, there is very little flexibility for students to develop other interests that can inform their work as teachers.

Teaching in an urban setting is a unique experience and teacher preparation programs should provide more coursework addressing issues of diversity and social justice. These courses should not be just stand-alone diversity courses but core aspects of the curriculum. Teachers need to be trained how to integrate social justice concepts. Multicultural education should extend beyond a model of practice that emphasizes the inclusion of cultural holidays, culturally significant people, or treating all students as culturally homogeneous. Placing student teachers in environments that are not conducive to their own pedagogical growth only perpetuates a limited model of classroom practice. For pre-service science teachers, they should have a sound background in science and science education, while understanding the complexity of working with diverse students. In multicultural education settings, Ross and Smith (1992) suggest that supervisors of pre-service teachers encourage pre-service teachers to reflect specifically upon issues related to multicultural education. For multicultural science education students, this would mean contrasting and comparing science classes that are conducive to diverse learners, reflecting upon access to scientific knowledge, and examining how students establish connections between their culture and the culture of science.

Community Networks and Connections

As more teachers prepare to work in environments that are increasingly diverse and urban, it is imperative that pre-service and novice teachers are in direct contact with the community with whom they work. Although most teacher educators and urban districts agree that an understanding of the community culture is important to effective urban teaching, there are few examples of teacher preparation programs or in-service programs

that provide opportunities for teachers to explore or learn about the community and its citizens (Cruz, 1997).

As seen through the participants' this lack of exposure can lead to negative attitudes about minority families and the community. Research on minority family support reveals family and community support networks can provide considerable strength, resilience, and agency for students (Irizarry, 2007). Some of these families are the main reason young urban students sometimes manage to excel in school.

Unfortunately the participants in the study were unable to see this connection. Despite their commitment to teaching and the potential benefits of working with community members and families in an urban district, they were missing out on participating in activities on the student's turf. Consequently, they didn't experience first-hand some of the multiple sites from which their students and their families draw to create their identities (church, community-based organizations, sports leagues, etc.).

The benefit of teachers sharing memberships in communities with their students is a shared sense of responsibility; they have roots and a vested interest in the community. Prior research on urban teaching reveals community is a valuable theme for teachers to explore as part of their students' learning (Brown, 2002; Cary, 2000; Delpit, 1995; Gay, 2000; Howard, 2001, Ladson-Billings, 1994; Weiner, 1999).

There is evidence that when student teachers complete their internship in an urban public school, their confidence and commitment to teach in culturally diverse areas is strengthened (Pagano, Weiner, Obi, & Swearingen, 1995). Field-based experience and shared membership in multicultural communities has also shown to be important in the

reduction of stereotypes and misconceptions among educators (Darling & Ward, 1995), even when the field experience is short (Wolffe, 1996).

While being from the same cultural background and living in the same city or neighborhood as one's students has obvious advantages, teachers who do not share membership in these communities should have opportunities through teacher preparation programs and or urban districts to develop meaningful relationships with these groups. Learning and understanding urban students' community helps educators capture how social and institutional structures, students' identities, and relationships intersect (Pierce, 1996).

As suggested by the participants, it is difficult to gain meaning experiences in the local community and with the parents. Therefore teacher preparation programs and urban districts should create meaningful opportunities for teachers to connect with the local community outside of the school setting.

More specifically, teacher educators and urban districts may consider inviting community members into courses and professional development trainings to help expose teachers to urban demographics and issues, and to help teachers learn the history of the community and the contributions of underrepresented groups. Readings and discussions around these topics can equip student teachers and novices with the knowledge to help improve their teaching. In addition to trainings and discussions, direct experiences in urban communities are invaluable. Participation in firsthand activities in the community has immediacy that can not be duplicated by reading a text or in a classroom setting.

Pre-service teachers spend the majority of their preparation in classroom at their institutions of higher education. When they do engage in fieldwork it is typically confined to schools. While spending time in schools is a vital component of teacher preparation, teachers should also have to engage in community work outside of schools. Teacher candidates and novice teachers working with families in non-school settings develop a broader understanding of the communities and individuals they work with. Participation in the local community should not be left to happenstance but must be made an integral part of teacher preparation programs.

Culturally Relevant and Responsive Pedagogy- Implications for Teacher

Preparation

All of the participants relied on culturally responsive and relevant pedagogies as a means of effective urban teaching. The complex demands of culturally relevant pedagogy pose urgent challenges to teacher preparation programs, especially since the demographic reality is one of an increasingly diverse student population and a considerably homogeneous teaching population. As a result, teachers are more frequently being asked to teach students who have different backgrounds and life experiences from their own. This demographic reality makes it necessary for teacher preparation programs to better prepare their teacher candidates for the diversity of students they will teach.

Exploring the connections between racial and ethnic identities and pedagogy is essential for all teachers, since teachers and students belong to a host of microcultures (Schempp

& Graber, 1992). Zeichner (1990) argues that even if efforts to recruit and retain students of color in teacher preparation programs are successful and there is an increase in their number, the need to bridge cultural knowledge and pedagogy is still of great importance (p. 133). This also holds true for teachers who share a significant part of their cultural background with students.

It cannot be assumed that teachers can easily translate cultural knowledge into culturally relevant pedagogy (May, 1994). Although a teacher may share many cultural aspects with his or her students, including racial or ethnic background, other differences, such as socio-economic status, can create challenges for teachers. Hence all teachers need to become aware of the many cultures they are a part of and how it might affect their teaching and their students' learning.

Teachers holding high expectations, scaffolding from home to school, and involving parents and community members in schools are essential to increasing teachers' effectiveness with students of color and those in poverty (Villegas, 1991; Zeichner, 1996). However, an increased emphasis on the importance of teachers having a clear sense of their own cultural identities and their relationship to teachers' understanding of socio-economic inequities is evident in recent literature (Villegas & Lucas, 2002, pp. 27-35).

Thus, successful teaching of students of diverse backgrounds calls for teachers who understand relationships between racial and ethnic identity and pedagogy and are aware of how schools can perpetuate socio-economic inequities (Howard, 2003). These

elements are critical in preparing teacher candidates to effectively teach students of color and those in poverty.

Addressing relationships of race, ethnicity, pedagogy and issues of socioeconomic inequity and schooling connect the more personal and social dimensions of teaching.

“An examination of these important dimensions in social foundations courses complicates and sophisticates teachers' understandings, resulting in less paternalistic and more authentic engagements with students” (Grant, 1990, p.405). It allows teachers to see that they are socially constructed beings and that schools and classrooms are microcosms of larger societies. This elevates critical elements of culturally relevant pedagogy-high expectations, scaffolding, and parent involvement-to more than educational buzzwords with predictable and measured outcomes.

Teacher candidates become aware that their expectations of students are affected by the ways they have been socialized as individuals and as teachers. This then allows them to appreciate that their ability to scaffold students' learning is dependent on a deep understanding of their students, beyond what they have come to know through socialized and filtered means.

Cultural responsive teachers of students of color and in poverty have an awareness of the social construction of their identities and those of their students and what those identities represent in broader social contexts (Ladson-Billings, 2001). These teachers are aware that identity is shaped by cultural experiences and that both the individual and the cultures they represent have an impact on teaching and learning. This becomes especially

poignant in the case of white middle and upper class teachers, where there is a need for them to recognize what they symbolize. Their whiteness, along with the power and privilege it embodies, will be a defining characteristic in a classroom (Irvine & Fraser, 1998).

These teachers will need to understand issues of representation and how their whiteness shapes the way they see students of color and those in poverty (Irvine, 1990).

Consequently, not only do teachers need to be competent in their subject matter and teaching methodologies, but they also need to address the personal and social realities of race and class and their pedagogical implications. This will require middle and upper class white teachers to acknowledge that social systems and specifically schools are inequitable and that in many cases they have personally benefited from this inequity.

There is powerful evidence demonstrating how social class shapes schooling and how teachers play a role in this process. In a review of literature on social class and schooling, (Darling-Hammond & Sclan,1996) assert that teachers' social-class identification is critical to understanding how they see themselves as teachers and how they understand their students. This conclusion is supported by Shujaa's (1995) study of several initiatives in U.S. school districts to integrate African and/or African American content into the curriculum to make instruction more culturally relevant for African American students.

Shujaa (1995) contends that in order to support culturally relevant teaching, professional development must be directed toward enabling teachers to focus on their conceptions of themselves and others, their cultural knowledge, and their classrooms' social structure.

Shujaa (1995) further argues that culturally relevant pedagogy is more than an infusion of

content; it requires teachers to recognize who they are racially, culturally, and economically as individuals and how they have learned to view others who are racially, culturally, and economically different from themselves in order to effectively implement culturally relevant pedagogy.

Implications for Urban Science Education

Although there is nothing in the findings chapter that distinguishes the participants as science teachers, it does matter that they teach science.

Urban science education in our country is a civil rights issue and we have to shift from the argument of just providing students with shared physical space in schools to providing high quality academic preparation that includes opportunities to learn science (Tate, 2001). Our society has a history of hierarchical relationships between those who know science and those who don't (Gay, 2000). A large number of urban students lose interest in science and develop negative attitudes towards the subject by the time they complete middle school (Atwater, Wiggins, Gardner, 1995). This is not surprising given that students in urban districts often have inequitable access to qualified teachers, resources and opportunities for academic success in science (Morris, 2004).

Although science and engineering capability will be the foundation of economic success for the US in the 21st century, our nation's competitiveness in the STEM fields is steadily eroding (NSF, 2004). One of the main reasons for this decline is the lack of interest in STEM fields by diverse groups African American, Latino, South East Asian, and Native Americans, (ALANA). Despite a steady increase in these groups pursuing and

completing advance degrees, ALANA students continue to be drastically underrepresented in STEM majors and careers. Occupations in STEM are expected to grow by 22% between the years 2002-2012. In comparison the job growth for other occupations is 10% (US Bureau of Labor Statistics, 2007). We can no longer prepare some of our students for possible STEM professions.

Clearly it is important to focus on and address the personal and professional experience of urban science teachers in order to improve the state of science education for all.

This preliminary study has brought to the forefront accounts of how veteran urban science teachers negotiated tri-cultural conflict and strategies that can be used to improve the understanding of the cultural contexts of teaching.

The relationships among the themes identified in this study are complex. Further research is needed to better understand these relationships. The information provided through the narratives reveals the importance of personal, institutional and community culture on urban educators. Urban districts need to provide opportunities for teachers to dialogue with other educator and work through the cultural socialization spheres in a safe supportive environment. Developing such relationships requires participation from university teacher preparation programs, urban districts, and local communities.

Educational legislation related to accountability pressures is an increasingly powerful force in urban schools. Beginning teachers need to understand their rights and responsibilities and have opportunities to voice their frustration as well as develop strategies to navigate through the requirements of standards based education.

In addition these areas need to be examined in relationship to teacher retention in urban districts

This study is significant for several reasons. First, it represents the initial steps in research exploring the affects of cultural contexts on urban novice science educators. Next, it is essential for teachers to understand the impact of teaching in an environment that is different from their own. It is also valuable for teacher educators to understand the importance of helping pre-service teachers develop strategies for creating a cultural balance during their career. With a better understanding of the cultural contexts of teaching we can help promote the professional and personal well being of urban science teachers.

APPENDIX A

TEACHER CONSENT FORM

My name is Marlina Duncan and I am a doctoral student at the University of Massachusetts, Amherst, in the Teacher Education School Improvement program with a concentration in Science Education. I am now in the dissertation phase of my program and requesting your participation in this research study.

My topic for investigation is the cultural socialization process of veteran urban secondary science teachers. The intent of the research is to gain an in-depth understanding of the cultural contexts of urban science teaching through examining the life experiences, professional stories, and reflections of veteran urban science teachers. Additionally, I hope to gain insight on how veteran science educators negotiate the cultural spheres of teacher socialization (personal, institutional, and community) and how this process shaped their induction into the teaching profession and sustains their personal and professional well-being.

Having been an administrator at a K-8 charter school and a former high school science teacher, both in urban districts, I have direct experience with the need to recruit and retain qualified and prepared secondary science teachers in urban districts.

The findings from the individual and collective voices of successful veteran urban science teachers like you, will provide our policy makers and institutions some insights into understanding some of the significant factors that have encouraged or discouraged individuals to enter and remain in the field of urban science education. It is for this reason that I invite you to participate as a participant in this study.

This study employs an Interpretive Qualitative approach in which Phenomenological interviews will be the primary instrument for data collecting. There will be three ninety-minute audiotaped interviews within a two-week period, which will be scheduled at your convenience and at a location you select. The secondary sources of data collection will include classroom observations, member checks and group interpretation and analysis of data.

The first interview session will focus on the historical or biographical context of your experiences from birth to present. The second interview will focus on your present career as a science teacher. In the last session the focus will be reflections on the meaning you constructed and how you balance your personal life, work community/culture, and the local community/culture you work in.

To guard against you being vulnerable to any aspect of this study, I will work to maintain your anonymity in all written or published material. I will use pseudonyms for all participants, locations, and institutions at all times in this study. Interview tapes will be

recorded, then transcribed, and will be stored and labeled only with your pseudonym. Your name will be removed from any documents collected. I am asking you to allow me to extensively use your words in my dissertation and published material. At your request I will share any written material that includes your words, for your review of accuracy.

No physical, psychological, or social risks are anticipated. If you have any questions or concerns about this study, please contact me, the principal researcher at mduncan@educ.umass.edu, or my advisor Dr. Allan Feldman at afeldman@educ.umass.edu (413 545- 1570). If you have any questions regarding your rights as a participant or any concerns regarding this study, you may report them to the University Human Subjects Research Committee, University of Massachusetts at (413) 545-6984.

Your participation in this study is voluntary. You may withdraw your consent and discontinue your participation in this study at any time. No penalty or prejudices will be experienced if you refuse to participate or to discontinue in this study. You have the right to request that I withhold material from any of your interviews.

Your signature below indicates that you have read and understand the information provided above and that you willingly agree to participate in this study.

Please sign and return one copy to me and retain a copy for your records.

Participant's Signature _____

Date

Researcher's Signature _____ Date

APPENDIX B

TEACHER INTERVIEW QUESTIONS

Interview I Questions

Focus- Biographical Information

- As you reconstruct the story of your past, your journey to this point of your career, please share stories about the following aspects of your life:
 - Family
 - Community
 - Interest in Science
 - School/Institutions – K-12, college, graduate degrees
 - Cultural Background
- How did you get to your present career as a science teacher?

Interview II Questions

Focus-Present

- How would you describe your philosophy of teaching? What do you believe “works”?
- What is it like for you to work in an urban district?
- As you reconstruct your experience as an urban science teacher how do they connect to
 - School Community /Institution
 - Local Community
 - Students

- Colleagues
- School Science Department
- What kind of role do you believe parents and the community play in the success of students?
- How do think the schooling experience of the students you teach differs from that of white students in middle-class suburban communities?
- What kinds of things have you done in the classroom that has facilitated an interest in science and academic success of your students?
- Do you incorporate student cultural references to teach science? If so, can you give an example?
- How would you describe the kinds of relationships you've had with the parents of students you've taught?

Interview III Questions

Focus- Reflection

- If you could revamp science teacher education so that teachers would be more effective with diverse urban youth what changes would you make?
- During your first year(s) of teaching how did you negotiate the cultural contexts of the teaching profession? (school culture, community culture, personal culture(belief system))
- How important is it to include cultural references in science teaching
- What is like for you in your world as an urban science teacher in reference to:
 - Family
 - Your Community

- School Community

- Describe your most memorable professional challenge as an urban science teacher
 - How did you overcome this challenge?

- Describe your most memorable success as an urban science teacher

APPENDIX C

SAMPLE SOCIAL JUSTICE LESSONS

Power of Agriculture Seminar Series

Power of Agriculture seminar series: objectives and proper etiquette

Introduction

An important component of your experience at the agriscience and technology center is attendance and participation in our spring seminar series. Seminar attendance is a necessary part of professional life, whether you become a research scientist, physician, college professor or CEO of a company. Professionals use seminars to disseminate information and as a forum for free exchange of ideas. It is important to cultivate the habit of attending seminars early in your academic career. It is also necessary to learn the proper etiquette for conducting yourself in a professional manner.

Objectives

The objectives of the monthly seminar series are to:

1. Introduce students to a broad spectrum of the science being done in agriculture and its related industries
2. Stimulate students to think creatively by exposing them to current scientific research processes, ideas, results, etc.

Seminar Etiquette

While you may not follow all details of a seminar, you should be able to extract some valuable information of interest from each talk. The seminar speakers are professional scientists, policy makers, journalists, etc many of whom are nationally, and even internationally, recognized in their field. **They are generously donating their time to us.** Please respect the speakers and conduct yourself in courteous and professional manner.

You must observe proper seminar etiquette:

1. ***You must arrive on time*** (generally be in your seats few minutes before the scheduled time). If you run into problems and are going to be late, please enter the room as quietly and unobtrusively as possible (using the back door!).
3. ***Be attentive during the seminar.*** Please direct your attention to the speaker.
4. ***Avoid your urge (or need) to nap*** by taking notes or by bringing something to drink with you (if you feel yourself nodding off, get up quietly and go and stand in the back of the room).
5. ***Refrain from leaving the room to use the bathroom.*** Again, it's distracting to the speaker.
6. ***Refrain from talking to your friends.*** You would be surprised by how much the speaker can hear when your whisper in the back of the room. Such behavior is distracting to the speaker and audience, and demonstrates a lack of respect.
7. ***Do not ask questions during the seminar.*** All students should wait until the speaker finishes his or her presentation, then raise their hands and wait for the speaker's acknowledgement.
8. ***Do not leave before the seminar is finished.*** The seminars are all scheduled to end by 1:55 pm.
9. ***Do thank the speaker.*** Before leaving, introduce yourself by name and thank the speaker.

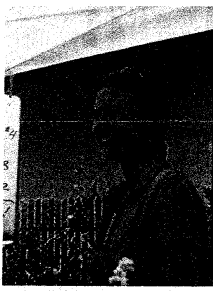


What is sustainable agriculture? It seems like all you hear about today is "going green". How does one go green and how can you empower yourself through agriculture. This semester-long series of events fosters openness, curiosity and dialogue about sustainable issues and topics in your community, country and world. Events will take place at the Donald F. Harris Sr. AgriScience & Technology Center. We challenge you to experience the "Power of Agriculture".

NO Farms, No Food
Featuring: **Jiff Martin**

Friday, February 20th, 11:30 am

Where do you find local food in Connecticut? What is the difference between local food and conventional food? What will it take to have more local food available in the future? Do we have enough farmland in Connecticut to grow local food for everyone? What can you do? What can towns do? Find out about ongoing campaigns in Connecticut to save farms and grow more local food.



Jiff Martin is AMERICAN FARMLAND TRUST'S Connecticut State Director. She is responsible for a variety of education and advocacy initiatives pertaining to farmland preservation, farm viability, and local food policy in Connecticut. Martin's prior experience includes working toward sustainable food and agriculture policy on behalf of Hartford Food System; conducting field research on food emergencies in Eastern Africa; and teaching in New Orleans. grassroots advocacy.

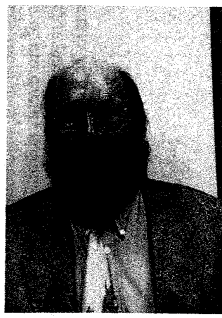
Working Lands Alliance
A Multi-interest Coalition Working to Preserve Connecticut's Farmland

How are we going to eat?
Featuring: **Bill Deusing**

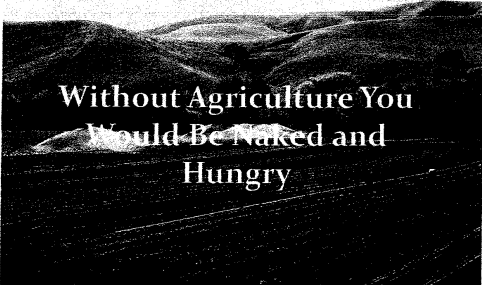
Friday, March 6th, 11:30 am

Please note: This event will take place at Granby High School, Granby Connecticut.

Food is our most important energy source. We will look at the reasons why a local, organic food system is critical to our future, take a tour of the local and organic food system now being created in Connecticut and explore some of the challenges this system faces. Learn how you can get involved in this exciting work.



Bill Duesing has been farming using organic methods for over 35 years on the Old Solar Farm in Oxford, and has been promoting a vigorous Connecticut food system for that time. He is currently the Executive Director of CT NOFA, the Northeast Organic Farming Association in Connecticut, president of the NOFA Interstate Council and past president of the Connecticut Farmland Trust. He was the founding director of the New Haven Ecology Project and its Common Ground High School (on a farm) and has created school gardens in Bridgeport, New Haven and Hamden.



Connecticut River Watershed Symposium

Welcome to the Connecticut River Watershed Symposium a collaboration between the [REDACTED]
 We welcome your feedback!!

Learning Targets	Comments
<p>Question/Introduction/Abstract I can explain the question that I looked at and give an accurate summary of the experiment that I conducted. I can explain what factors I looked at and how these factors impact stream health.</p>	
<p>Methods I can describe how the data for this experiment was collected. I can answer questions about sources of error in the data collection techniques.</p>	
<p>Results I can create accurate graphs and tables of the data. The graphs contain clear titles, labeled axes with names and units. I can describe and summarize the results in my data.</p>	
<p>Conclusions I can describe what the data and results mean. I can give possible reasons for the trends that I observed in the data. I can give a recommendation for the stream based on the data I found.</p>	
<p>Craftsmanship and Quality I can create a poster or power point that is of publishable quality. It is a neat and clean has no mechanical errors (spelling, grammar, punctuation). It uses complete sentences and a voice that is formal and factual.</p>	

Name of evaluator: _____

Name of Student(s): _____

Keynote Speaker: Ann Capra, Principal Planner, Pioneer Valley Planning Commission

What is the main focus of her talk?

What 3 learnings from this talk?

1.

2.

3.

How does this talk connect to our research for the Connecticut River Watershed Conference?

Do you have feedback for doing this conference again next year?

Name: _____

Noticings	Wonderings
<p>What have you learned about the health of the Connecticut River Watershed?</p>	
<p>Do you think the Connecticut River Watershed is healthy? Why or why not? Be ready to share out details....</p>	

BIBLIOGRAPHY

- Abelson, R.P. (1986). Beliefs are like possessions. *Journal for the Theory of Social Behavior*, 16, 223-250
- Akoto, K.A. (1992). Nation building: Theory and practice in African-centered education. Washington D.C. Pan African World Institute
- Alexander, P.A., & Dochy, F. J. R.C. (1995). Conceptions of knowledge and beliefs: A comparison across varying cultural and educational communities. *American Educational Research Journal*
- Agada, J. (1998). Multicultural education and the emerging paradigm: An essay in cultural epistemology. *The Urban Review*, 30(1): 77-95.
- Alexander, P. A., & Dochy, F. J. R. C. (1995). Conceptions of knowledge and beliefs: A comparison across varying cultural and educational communities. *American Educational Research Journal*, 32(2), 413-442.
- American Association for the Advancement of Science. (1998). *Science for all Americans*. New York: Oxford University Press.
- American Association for the Advancement of Science 1993. (1999, March). In D. J. Tippins, S. E. Nicholas, & A. Kemp (Eds.), *Cultural myths in the making: The ambiguities of science for all*. Paper presented at the Annual Meeting of the National Association for Research in Science Teaching, Boston.
- Atwater, M. (1994). Research on cultural diversity in the classroom. In D.L. Gabel (Ed.), *Handbook of Research on Science Teaching and Learning* (pp. 558-76). New York: Macmillan.
- Atwater, M. (1996). Social constructivism: Infusion into the multicultural science education research agenda. *Journal of Research in Science Teaching*.
- Atwater, M. M., Crockett, D., & Kilpatrick, W. J. (1996), Constructing multicultural science classrooms: Quality science for all. In J. Rhoton & P. Bowers (Eds.), *Issues in science education* (pp.167-176). Arlington VA: National Science Teachers Association.
- Atwater, M.M., Wiggins, J., & Gardner, C. M. (1995). A study of urban middle school students with high and low attitudes toward science. *Journal of Research in Science Teaching*, 32, 665-677.

- Au, K. H. (1998). Social constructivism and the school literacy learning of students of diverse Backgrounds. *Journal of Literacy Research*, 30 (2): 297-319.
- Ayers, W. (1998). Fact or fancy: The knowledge base quest in teacher education. *Journal of Teacher Education*
- Bailey, F., & Pransky, K. (2005). Are “others people’s children” constructivist learners too? *Theory into Practice*, 44(1), 19-27.
- Banks, J., Cochran-Smith, M., Moll, L., Richert, A., Zeichner, K., LePage, P., et al. (2005).
- Barton, A. (1997). Professor Angela Calabrese-Barton teaches science to the homeless. *TC Today*, 23 (1). Retrieved on December 31, 2008 from www.tc.columbia.edu/newsbureau/tctody/9706science.htm
- Beauboeuf-Lafontant, T. (1999). A movement against and beyond boundaries: Politically relevant teaching among African American teachers. *Teachers, College Records* 100(4), 702-723.
- Beauboeuf-Lafontant, T. (2003). A womanist experience of caring: Understanding the pedagogy of exemplary black women teachers. *Urban Review*, 34(1), 71-86.
- Beijaard, D., & Verloop, N. (1996). Assessing teacher’s practical knowledge. *Studies in Educational Evaluation*, 22 (3): 275-286
- Bellah, R. et al. 1985. *Habits of the Heart*. Berkeley: University of California Press.
- Berliner , D. (2006 , January). Our impoverished view of educational reform. *Teacher CollegeRecord* , 108, 949-995
- Berry, B. (2001). No shortcuts to preparing good teachers. *Educational Leadership*, 58(8), 32-36.
- Blank, W. (1997). Authentic instruction. In W.E. Blank & S. Harwell (Eds.), *Promising practices for connecting high school to the real world* (pp. 15-21). Tampa, FL:University of South Florida. (ERIC Document Reproduction Service No.ED407586)
- Bluestein, J. (2000). Create a caring classroom. *Instructor*, 110(2), 35-37.

- Bodley, J. (1994), "An anthropological perspective", *Cultural Anthropology: Tribes, States and the Global System*. Available from: <http://www.wsu.edu:8001/vcwsu/commons/topics/culture/culture-definitions/bodley-text>
- Bollin, G.G., & Finkel, J. (1995). White racial identity as a barrier to understanding diversity: A study of pre-service teachers. *Equity & Excellence in Education*, 28:25-30.
- Born, D. O. (1970). Psychological adaptation and development under acculturative stress. *Social Science and Medicine*, 3, 529-547
- Bourdieu, P. (1973). Cultural reproduction and social reproduction. In R. Brown (Ed.), *Knowledge, education and cultural changes* (pp.56-69). London: Tavistock.
- Boyd, D. Lankford, H. Loeb, S. & Wyckoff, J. 2005. "The Draw of Home: How Teachers' Preferences For Proximity Disadvantage Urban Schools." *Journal of Policy Analysis and Management*, 24(1): 113-132.
- Calabrese-Barton, , & Yang , (2000, January). The culture of power and education: Learning from Miguel . *Journal of Research in Science Teaching* , 37 , 871-879.
- Calabrese-Barton, A. (2001). Reforming "Science for All" through the politics of poverty. *Educational Policy*, 12 (5):525-541.
- Calabrese-Barton, A. (2001). Science education in urban settings: Seeking new ways of praxis through critical ethnography. *Journal of Research in Science Teaching*, 38, 899-917.
- Carnegie Report (1995). *Turning Points: Preparing American Youth for the 21st Century*, report of the Task Force on Education of Youth Adolescents. Retrieved from: <http://www.carnegie.org/sub/pubs/ccadpubs.html>
- Carnegie Council on Adolescent Development (1989). *Turning points: Preparing youth for the 21st century*. New York: Carnegie Corporation.
- Casteel, C. A. (2000). African American students' perceptions of their treatment by Caucasian teachers. *Journal of Instructional Psychology*, 27, 143-148.
- Clausen, J. A., ED, *Socialization and Society* Boston: Little, Brown, 1968
- Colbert, J.&Wolff, D. (1992). Surviving in urban schools: A collaboration model for a beginning teacher support system. *Journal of Teacher Education*, 43(3), 193-199.

- Cochran-Smith, M. (1995, January). Color blindness and basket making are not the answers: Confronting the dilemmas of race, culture, and language diversity in teacher education. *American Educational Research Journal*, 32, 493-522.
- Cochran-Smith, M. (1997). Knowledge, skills and experiences for teaching culturally diverse learners: A perspective for practicing teachers. In J.J. Irvine (Ed.), *Critical knowledge for diverse learners* (pp.27-87). Washington, D.C.: American Association of Colleges for Teacher Education.
- College Board. (1999). *Reaching the top: A report on the national task force on minority high achievement*. New York: Author.
- Condit, C. M., & Lucaites, J. L. (1993). *Crafting equality: American's Anglo-African word*. University of Chicago Press: Chicago.
- Connerley, M. L., & Pedersen, P. B. (2005). *Leadership in a diverse and multicultural environment: Developing awareness, knowledge, and skills*. California: SagePublications.
- Cooper, P. M. (2003). Effective White teachers of Black children: teaching within a community. *Journal of Teacher Education*, 54(5), 413-428.
- Creswell, J. (1998). *Qualitative inquiry and research design: Choosing among Five traditions*. Thousand Oaks, CA: Sage Publications.
- Cummins, J. (1993). Empowering minority students: A framework for intervention. *Harvard Educational Review*, 1, 18-36.
- Darling-Hammond, L. (1994). *The right to learn*. San Francisco: Jossey-Bass.
- Darling-Hammond, L., & Sclan, E. M. (1996). Who teaches and why: Dilemma of building a profession for twenty-first century schools. In J. Sikula (Ed.), *Handbook of Research on Teacher Education* (pp. 67-101, 2nd ed.). New York: Macmillan.
- Darling-Hammond, L. (2002). Learning to teach for social justice. In L. Darling-Hammond, J. French & S. P. Garcia-Lopez (Eds.), *Learning to teach for social justice*. New York, NY: Teacher's College Press.
- Davies, L. (1990). *Equity and efficiency?: School management in an international context*. New York: Falmer Press.
- DeHart Hurd, P. (2000). *Transforming Middle School Science Education*. New York: Teachers College Press.

- Delpit, L. (1988, January). The silenced dialogue: Power and pedagogy in educating other people's children. *Harvard Educational Review*, 58, 280-298.
- Delpit, (1992). Education in a multicultural society: Our future's greatest challenge. *Journal of Negro Education*, 61(3), 237-249.
- Delpit, L. (1995). *Other people's children: Cultural conflict in the classroom*. New York: The New York Press.
- Delpit, L. (1998). What should teachers do? Ebonics and culturally responsive instruction. In T. Perry, & L. Delpit (Eds.), *Power, language, and the education of African American children* (pp. 17-26), NY: Beacon.
- Delpit, L. (2003). Educators as “seed people” growing a new future. *Educational Leadership*, 7(32), 14-21.
- Dempsey, V., & Noblit, G. (1993). The demise of caring in an African American community: One consequence of school desegregation. *Urban Review*, 25(1), 47-61.
- Derman-Sparks, L. (1993). Empowering children to create a caring culture in a world of differences. *Childhood Education*, 70 (2), 66-71.
- Duncan-Andrade, J. (2005). Developing social justice educators. *Educational Leadership*, 62(6), 70-73.
- Epstein, J. L. (1987). Toward a theory of family school connections: Teacher practices and parent involvement. In K. Hurrelmann, F. Kaufmann, & F. Losel (Eds.) *Social intervention: Potential and constraints* (pp. 121-136). New York: DeGruyter.252
- Epstein, J. L. (1992). School and family partnerships. In M. Alkin (Ed.), *Encyclopedia of educational research* (6th edition, pp. 1139-1151). New York: Macmillan.
- Erickson, F. (1986). Qualitative methods of research on teaching. In M. Wittrock (Ed.), *Handbook of research on teaching* (3rd Edition). New York Macmillan.
- Erickson, R., & Mohatt, G. (1982). Cultural organization of participation structures in two classrooms of Indian students. In G. Spindler (Ed.), *Doing the ethnography of schooling: Educational anthropology in action* (pp. 132-174). New York:Holt.
- Feiman-Nemser, S., & Floden, R. E. (1986). The cultures of teaching. In M. C. Whittrock (Ed.), *Handbook of research on teaching* (3rd ed., pp.505-526). London: Collier-Macmillan

- Foster, M. (1997). *Black teachers on teaching*. New Press: New York.
- Freire, P. (1993). *Pedagogy of the oppressed: New revised 20th-anniversary edition*. New York: Continuum.
- Freire, P. (1998). *Pedagogy of freedom: Ethics, democracy and civic courage*. New York: Rowman & Littlefield.
- Gay, G. (2000). *Culturally responsive teaching*. New York: Teachers College Press.
- Gay, G. (2002, January). Preparing for culturally responsive teaching. *Journal of Teacher Education*, 53(2), 106-116.
- Gay, G., & Howard, T. C. (2001). Multicultural education for the 21st century. *The Teacher Educator*, 36(1), 1-16.
- Gee, J.P. (1999). *An introduction to discourse analysis: Theory and method*. New York: Routledge.
- Goetz, J.P., & LeCompte, M. D. (1984). *Ethnography and qualitative design in educational research*. Orlando, FL: Academic Press.
- Gold, Y. (1996). Beginning teacher support: Attrition, mentoring, and induction. In *Handbook of Research on Teacher Education*, 2nd Edition, p. 548-594.
- GreatSchools.net (2001). *Massachusetts school profiles*. Retrieved January 10, 2009 from <http://www.greatschools.net>.
- Gwendolyn Cartledge, Lefki Kourea. (2008). Culturally Responsive Classrooms for Culturally Diverse Students With and At Risk for Disabilities. *Exceptional Children*, 74(3), 351-371. Retrieved January 12, 2009, from Wilson Education Abstracts database. (Document ID: 1440304381).
- Haberman, M., & Rickards, W. (1990). Urban teachers who quit: Why they leave and what they do. *Urban Education*, 25, 297-303.
- Haberman, M. (2004). *The pedagogy of poverty*. West Lafayette, IN: Kappa Delta Pi.
- Hines, M. S. (2003). *Multicultural science education: Theory, practice, and promise*. New York: Peter Lang Publishing.
- Hollins, E. R. (1996). *Culture in School Learning: Revealing the Deep Meaning*. Mahwah, NJ: Erlbaum.
- Holloway, J. 2001. The benefits of mentoring. *Educational Leadership* 58 (8): 85-86.

- hooks, b. (1994). *Teaching to transgress: Education as the practice of freedom*. New York: Routledge
- Howard, T. C. (2001). Powerful pedagogy for African American students: Conceptions of culturally relevant pedagogy. *Urban Education, 36*(2), 179-202.
- Howard, T. C. (2003). Culturally relevant pedagogy: Ingredients for critical teacher reflection. *Theory Into Practice, 42*(3), 195-202. Retrieved on September 27, 2007 from www.findarticles.com.
- Hussar, W. (1998). Predicting the need for newly hired teachers in the United States to 2008-2009. Washington, DC: National Center for Education Statistics.
- Ingersoll, R. (1995). Teacher supply, teacher qualifications and teacher turnover. Washington, DC: National Center for Educational Statistics.
- Ingersoll, R. (1999). The problem of under qualified teachers in American secondary schools. *Educational Researcher, 28*, 26-37.
- Ingersoll, R. (2001). Teacher turnover and teacher shortages: An organizational analysis. *American Educational Research Journal, 38*, (3), 499-534.
- Ingersoll, R. (2003). *Is there really a teacher shortage?* Seattle, WA: Center for the Study of Teaching and Policy, September.
- Ingersoll, R. (2003). Who controls teachers' work? Power and accountability in America's schools. Cambridge, MA: Harvard University Press.
- Irizarry, J. G. (2007) Ethnic and urban intersections in the classroom: Latino students, hybrid identities, and culturally responsive pedagogy, *Multicultural Perspectives, 9*(3).
- Irvine, J. J. (1990). Black students and school failure: Policies practices and prescriptions. *Journal of Teacher Education, 54*(5), 413-428.
- Irvine J.J.(1992). Making teacher education culturally responsive. In M.Dilworth (Ed), *Diversity in Teacher Education* (pp.79-92). San Francisco: Jossey-Bass.
- Irvine, J.J. (2003). Educating teachers for diversity: Seeing with a cultural eye. New York: Teaching College Press
- Irvine, J. J., & Armento, B. (Eds.) (2001). *Culturally responsive teaching: Lesson planning for elementary and middle grades*. Boston: McGraw-Hill.

- Irvine, J., & Fraser, J. (1998, May 13). Warm demanders: Do national certification standards leave room for the culturally responsive pedagogy of African-American teachers? *Education Week*, p. 42.
- Johnson, K. (2001). Integrating an affective component in the curriculum for gifted and talented students. *Gifted Child Today Magazine*, Fall.
- Kottak, Conrad Phillip (2005) *Windows on Humanity*, pages 209, 423. McGrawHill, New York.
- Kozol, K. (1992). *Savage inequalities: Children in America's schools*. New York: Harper Perennial.
- LAB at Brown (2004). *Teaching diverse learners— Culturally relevant teaching: Brown University*. Retrieved January 15, 2008 from: <http://www.alliance.brown.edu/tl/tl-strategies/crt-principles.shtml>
- Ladson-Billings, G. (1992). Reading between the lines and beyond the pages. *Theory into Practice*, 31, 312-320.
- Ladson-Billings, G. (1994). *Dreamkeepers: Successful teachers of African American children*. San Francisco: Jossey-Bass.
- Ladson-Billings, G. (1995). But that's just good teaching! The case for culturally relevant pedagogy. *Theory Into Practice*, 34(3) 159-165.
- Ladson-Billings, G. (2000). Fighting for our lives: Preparing teachers to teach African American students. *Journal of Teacher Education*, 51(3), 206-214.
- Ladson-Billings, G. (2001). *Teaching and Cultural Competence: What Does it Take to be Successful in a Diverse Classroom?* Retrieved on September 17, 2007 from: http://www.rethinkingschools.org/archive/15_04/Glb154.shtml
- Ladson-Billings, G. (2001). *Crossing over to Canaan: The journey of new teachers in diverse classrooms*. San Francisco: Jossey-Bass.
- Leland, C., Harste, J. (2005). Doing what we want to become. *Urban Education*, 40(1):60-77.
- May, Stephen, 1994 *Making multicultural education work / Stephen May Multilingual Matters*, Clevedon [England] ; Philadelphia
- Matus, D. (2004). An innovative strategy supports student teachers in urban secondary schools. *Clearing House*, 73(1), 37-42.

- Mehan, H., Lintz, A., Okamoto, D., & Wills, J. S. (1995). Ethnographic studies of multicultural education in classrooms and schools. In J. A. Banks & C. A. M. Banks (Eds.), *Handbook of research on multicultural education* (pp. 129-144).
- Merton, R.K. (1975). *Social theory and social structure*. New York: Free Press.
- McAlpine, L., Crago, M. (1995). The induction year experience in a cross-cultural setting. *Teaching and Teacher Education*, 11(4), 403-425.
- Miles, M. & Huberman, A. (1994). *Qualitative data analysis*. A sourcebook, (2nd Ed.). Thousand Oakes, CA: Sage Publications.
- Montero-Sieburth, M. (1998). Restructuring teacher knowledge for urban settings. *The Journal of Negro Education* 58(3) 332-344.
- Morris, J. (2004). Can anything good come from Nazareth? Race, class, and African American schooling and community in the urban south and midwest. *American Educational Research Journal*, 41(1), 69-112.
- Morrow, R. A., & Torres, C. A. (1995) *Social theory and education*. New York: State University of New York Press.
- National Center for Education Statistics. (1999). *Teacher quality: A report on preparation and qualifications of public teachers*. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.
- National Center for Education Information (NCEI) (2005). *Profile of teachers in the U.S. 2005*. Washington, D.C.: Author. Retrieved October 2008 from www.ncei.com/POT05PRESSREL3.htm
- National Center for Education Statistics (NCES) (1997). *Digest of education statistics, Table 53*. Retrieved on June 14, 2008 from <http://nces.ed.gov/pubsold/D95/dtab053.html>
- National Center for Education Statistics (NCES) (1990-2000). *Nations report card at assessment of educational progress (NAEP)*. Retrieved on June 20, 2008 from <http://Nces.ed.gov/nationsreportcard>.
- National Center for Education Statistics (NCES) (2001-2002). *Nations report card at assessment of educational progress (NAEP)*. Retrieved on June 20, 2004 from <http://nces.ed.gov/nationsreportcard>.
- National Commission on Teaching and America's Future. (2003.) *No Dream Denied: A Pledge to America's Children*. Washington, DC.

- National Research Council. (2000) *Inquiry and the national science education standards: A guide for teaching and learning*. Washington DC: National Academy Press.
- National Science Foundation. (2002). *Women, minorities, and persons with disabilities in science and engineering*. Arlington, VA.
- National Science Foundation, Division of Science Resources Statistics, Scientist and Engineers Statistical Data System (SESTAT) 2003.
- National Science Foundation, Division of Science Resources Statistics, Women, Minorities and Person's With Disabilities in Science and Engineering: 2000, NSF 00-327 (Arlington, VA 2000).
- National Science Foundation, Division of Science Resources Statistics, Women, Minorities, and Persons with Disabilities in Science and Engineering: 2003, NSF 04-317 (Arlington, VA, 2003).
- National Science Foundation, Division of Science Resources Statistics, Women, Minorities, and Persons with Disabilities in Science and Engineering: 2004, NSF04-317 (Arlington, VA, 2004).
- Nieto, S. (2000). Placing equity front and center: some thoughts on transforming teacher education for a new century. *Journal of Teacher Education*, 51(3), 180-188.
- Nieto, S. (2004) *Affirming diversity: the sociopolitical context of multicultural education* (4th edition)(Boston, MA, Allyn & Bacon).
- Oakes, J. (1990). *Multiplying inequalities: The effects of race, social class and tracking on opportunities to learn mathematics and science*. Santa Monica, CA: RAND
- Ogbu, J.U. (1995) Cultural problems in minority education: Their interpretations and consequences. *The Urban Review* 27(3) 200-245.
- Ogbu, J. U. (2003). *Black American students in an affluent Suburb: A study of academic disengagement*. New Jersey: Lawrence Erlbaum Publishers.
- O'Sullivan, C.Y., Lauko, M.A., Grigg, W.S., Qian, J. & Zhang, J. (2003). *The nation's report card: Science 2000*. Washington, DC: U.S. Department of Education, Institute of Education Sciences.
- Pagano, A, Weiner L., Obi, R. & Swearingen, J. (1995). How student teaching in an urban setting affects teacher candidates' career motivations. *The Urban Review*, 27 (1), 57-76.

- Patton, M.Q., (1990). *Qualitative evaluation methods*. Beverly Hills, CA: Sage Publications.
- Perry, P. (2002) *Shades of white: white kids and racial identities in high school* (Durham, NC, DukeUniversity Press).
- Perry, Steele, Hillard (2003). *Young Gifted and Black*. Boston: Beacon Press.
- Philips, S. (1983). *Invisible culture*. New York: Longman.
- Phuntsog, N. (1999, Summer). The magic of culturally responsive pedagogy: In search of the genie's lamp in multicultural education. *Teacher Education Quarterly*, retrieved on June 9, 2005 from www.findarticles.com
- Pierce, D.R. (1996). Early field experiences and teacher preparation: Authentic learning *The Teacher Educator* 31(3), 217-225.
- Presseisen, B. (1988) Teaching minority children. *Teaching Thinking and Problem Solving*, 10 (January-February) 1-4.
- Peng,S.,&Hill,S.(1994). Characteristics and educational experiences of high-achieving minority secondary students in science and mathematics. *Journal of Women and Minorities in Science and Engineering*, 1, 137-152.
- Rabinowitz, S. (2004). *Teacher assessment and professional development*. Retrieved from: www.wested.org.
- Rodriguez , A. (1998a). Busting open the meritocracy myth: Rethinking equity and student achievement in science education . *Journal of Women and Minorities in Science and Engineering*, 4(2,3), 195-216.
- Rodriguez , A. J. (2001). From gap gazing to promising cases: Moving toward equity in urban education reform. *Journal of Research in Science Teaching* , 38, 1115-1129.
- Rossmann, G., & Rallis, S. (2003). *Learning in the field: An introduction to qualitative research*. Thousand Oaks, CA: Sage Publications.
- Rowan, B., Correnti, R., & Miller, R. J. (2002). What large-scale survey research tells us about teacher effects on student achievement. Philadelphia: Consortium for Policy Research in Education, University of Pennsylvania. Retrieved March 10, 2008, from <http://www.cpre.org/Publications/rr51.pdf>

- Sanders, M. G. & Epstein, J. L. (1998). School-Family-Community partnerships in middle and community high schools: From theory to practice. Baltimore, MD: Johns Hopkins University Report No. 28. The center for Research on the Education of Students Placed at Risk (CRESPAR), U.S. Department of Education (R-117-D40005).
- Savage, C. J. (2002). Cultural capital and African American agency: The economic struggle for effective education for African Americans in Franklin, Tennessee, 1890-1967. *The Journal of African American History*, Spring 2002, 206-236.
- Schempp, P. G. & Graber, K. C. (1992). Teacher socialization from a dialectical perspective: Pretraining through induction. *Journal of Teaching in Physical Education*, 11, 329-348.
- Schutz, A. (1967). *The phenomenology of the social world*. (G. Walsh & F. Lenhart, Trans.). Chicago, IL: Northwestern University Press.
- Schwartz, F. (1996). Why many new teachers are unprepared to teach in most New York City schools. *Phi Delta Kappan, Bloomington*, 78(1), pg. 82.
- Schommer, M. (1994). An emerging conceptualization of epistemological beliefs and their role in learning. In R Garner & P.A. Alexander (Eds.), *Beliefs about text and instruction with texts* (pp.25-55) Hillsdale, NJ: Erlbaum.
- Seidman, I. E. (2006). *Interviewing as qualitative research: A guide for researchers in education and the social sciences* (3rd edition). New York: Teachers College Press
- Seiler, G. (2001). Reversing the "standard" direction: Science emerging from the lives of African American students. *Journal of Research in Science Teaching*, 38, 1000-1014.
- Shade, B. J., Kelly, C., & Oberg, M. (1997). *Creating culturally responsive classrooms*. Washington, DC: American Psychological Association.
- Shujaa (Summer, 1995), *Theory into Practice*, Vol. 34, No. 3, Culturally Relevant Teaching pp. 194-201
- Sleeter, C. E. (2001) Preparing teachers for culturally diverse schools, *Journal of Teacher Education*, 32, 94-106.

- Smith , F. M., & Hausafus, C. O. (1998). Relationship of family support and ethnic minority students' achievement in science and mathematics. *Science Education*, 82, 111-125.
- Strauss, A. &Corbin, J. (1994). Grounded theory methodology. In N. Denzin & Y. Lincoln (Eds.) *The Handbook of Qualitative Research*. (pp. 273-285). Thousand Oaks: Sage Publications
- Stempelski, S. (1998). *Techniques for raising culture awareness*. New York: B K B &Cassett.
- Tate, W. (2001). Science education as a civil right: Urban schools and opportunity-to-learn considerations. *Journal of Research in Science Teaching*, 38(9), 10.
- Tippins, D. J., Nicholas, S. E., & Kemp, A. (1999, March). *Cultural myths in the making: The ambiguities of science for all*. Paper presented at the Annual Meeting of the National Association for Research in Science Teaching (Boston, MA, March 28-31, 1999).
- Tobin , K. (2000, January). Becoming an urban science educator . *Research in Science Education* , 30, 89-106.
- Tobin , K., Roth , W., & Zimmerman, A. (2001). Learning to teach science in urban schools. *Journal of Research in Science Teaching* , 38, 941-964.
- Tomlinson, C. A. (1999). *The differentiated classroom: Responding to the needs of all learners*. Alexandria, VA: Association for Supervision and Curriculum Development Publications.
- U.S. Department of Education (2002). Meeting the highly qualified teachers challenge: The secretary's annual report on teacher quality. Department of Postsecondary Education, office of Policy and Innovation. Washington, D.C.:U.S. Government Printing Office.
- U.S. Department of Education, National Center for Educational Statistics. (2000). *Urban schools: The challenge and location of poverty*. Washington, DC.
- Valverde, G., & Schmidt, W. (1998). Refocusing U.S. math and science education *Issues in Science and Technology*, 14(2), 60-66.
- Van Manen, M. (1990). *Researching lived experience: Human science for an action sensitive pedagogy*. London, Ontario: SUNY Press.

- Viadero, D. (1996). *Lisa Delpit says teachers must value students' cultural strengths*. Retrieved December 31, 2003 from www.edweek.org/ew/1996/25delpit.html
- Villegas, A., & Lucas, T. (2002). *Educating culturally responsive teachers*. ERIC ED459168
- Villegas, A. M., & Lucas, T. (2002). Preparing culturally responsive teachers: Rethinking the curriculum. *Journal of Teacher Education*, 53(1), 20-32.
- Weiner, L. (1999). *Urban teaching: The essentials*. New York: Teachers College Press.
- Weis, L., & Fine, M. (1993). *Beyond silenced voices: Class, race, and gender in United States schools*. Albany, NY: State University of New York Press.
- Weis, L. (2000). *Class race and gender in American education*
- Wilkinson, G. (1997). Beginning teachers identify gaps in their induction programs. *Journal of Staff Development*, 18(2), 48-51.
- Yon, D. (2000). *Elusive Culture*. New York: SUNY Press
- Zeichner, K. & Gore, J. (1990). Teacher socialization. In R. Houston (Ed). *Handbook of research on teacher education* (pp.329-348). New York, London: Macmillan.
- Zeichner, K. (2003). The adequacies and inadequacies of three current strategies to recruit, prepare, and retain the best teachers for all students. *Teachers College Record*, 105 (3), 490-515.