Influence of Pre-Service Teachers' Beliefs About Diversity on Science Teaching and Learning

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Dissertation submitted to the Faculty
of the Virginia Polytechnic Institute and State University
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy
in
Curriculum and Instruction

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February 13, 1998
Blacksburg, Virginia

Keywords: pre-service teachers, diversity, multicultural education, border crossings, and teacher beliefs

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Abstract

The influences of the background experiences of five pre-service Science teachers on their beliefs about diversity were the focus for this study. These individuals were followed throughout their teacher preparation program. The data for this study consisted of interviews, conducted before and after entering the field. Data also consisted of any relevant written assignments. The data for this study were analyzed according to emerging themes, depicting initial beliefs and any changes in the beliefs occurring over time. The results of this study were organized into vignettes, telling each story from before and after the students entered the program. Three themes emerged from an analysis and interpretation of the vignettes: (1) Early life experiences shaped the pre-service teachers' sense of identity and influenced their beliefs on diversity, (2) Experiences with diversity influenced pre-service teachers' philosophy of teaching, and (3) Experiences with diversity during the teacher preparation program challenged or confirmed pre-service teachers' preexisting beliefs. The implications from this study suggest that pre-service teachers need challenging experiences in diverse classroom settings that will promote an expansion of their beliefs, enabling them to cross cultural borders.

Acknowledgments

I have many people to thank for contributing to my progress over the past years. Because of their dedication and commitment, I have been able to accomplish many things. I have been able to focus and become informed about issues that are very meaningful to me.

First, I will begin by acknowledging Dr. George E. Glasson, my advisor, most importantly, my mentor. The environment that he created provided an atmosphere which nurtured and developed me as a researcher. Because of his motivation and support, I was provided a variety of opportunities to flourish. His unselfish guidance provided a nurturing climate which enabled me to grow, to explore, and to realize my worth and potential as an individual and as an educator. Any graduate student would be fortunate to be supervised by him.

I would also like to especially thank Dr. Thomas Sherman. Mere words cannot express the undying gratitude that I have in my heart for his unwavering support. Having lost my spouse earlier in my graduate program, he assisted me in staying focused, convincing me that I could be successful, and that it would be worthwhile. His support and advice as an instructor and committee member provided me with direction which guided my progress throughout this program.

In addition to the above, I would like to acknowledge the contributions of Dr. Gary Downey. I regard him as the professor who contributed to my understanding of my identity in the society in which I live. The growth that I experienced, as a result of my encounters with him, influenced my research focus and will govern my existence throughout eternity.

Now, in recognition of the final committee members, Dr. Susan Magliaro, who was an excellent role model and Dr. Sidney Crumwell, who supported me untiringly by providing feedback and insight for my research, I must say that I consider myself

fortunate to have been mentored by such fine educators. I would also like to mention my newly found friend, Dr. Paula Wilder, who stood in for an absent committee member at my defense. Although she arrived at the final phases of this process, her contributions were profound and greatly appreciated.

Finally, I would like to acknowledge family members, Geronetta (my niece), Howard (my son) and my mother and father, Mr. and Mrs. James E. Rodges. I can honestly say that it took all of you, working together to get me across these hurdles. Your prayers and support were needed and greatly appreciated. I don't think I could have made it without you. I am eternally grateful.

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Introduction and Rationale

Diversity is a much discussed topic in education. After all, schools are the major arenas where issues regarding diversity are staged. Educators believe that diversity places great and more complex pedagogical demands on schools. Schools are facing challenges associated with differences in learning preferences, performance levels, linguistic differences, alternative cultural practices and beliefs, and ethnic differences. Educators have the responsibility of building bridges that will create welcoming and productive learning environments for all students. A process which focuses on creating nurturing learning environments for all students is known as multicultural education (Davidson & Phelan, 1993).

In literature, multicultural education has taken many forms and is defined in many different ways (Grant, 1992). To many, multiculturalism is a process that is limited to ethnic and racial differences. The focus is primarily on integrating ethnic related contributions or materials into a curricula to satisfy a certain criteria or sector of people. However, multicultural education extends beyond the inclusion of supplemental culturally relevant curriculum (Banks, 1992). It focuses on creating a learning environment that is user friendly for all students. Multiculturalism builds on the assumption that teaching and learning are invariably cultural processes, especially since schools are composed of teachers and students from a wide variety of cultural backgrounds (Gay, 1994). Its basic focus is to incorporate the experiences of all students by presenting a curriculum that is relevant and useful to them (Melear, 1995).

A multicultural classroom provides opportunities for students to work together so that they will gain respect for each other. In this classroom, stereotypes and myths are dispelled through interactions with other students. Ethnically diverse students learn that the term "minority" does not signify inferiority. All students are educated in a classroom which acknowledges and nurtures their potential. All students are expected to

be positive contributors to society. To many, this might be considered a utopian endeavor. Achieving such harmony within a classroom setting might seem a difficult task. However, terms such as respecting, nurturing, encouraging, and motivating are not fringe benefits in education. They are an expected fulfillment of a teacher's responsibility.

Without a doubt, accomplishing the goals of multicultural education is a difficult task. To be successful, teachers must first begin with themselves. They must start by challenging their own beliefs about diversity and multiculturalism. They must examine how their beliefs about diversity and multiculturalism are influenced by their own experiences, at home, school, or in the media (Scott, 1995).

Examining teachers' experiences and beliefs was one of the primary foci of this research study. This study was designed to explore pre-service teachers' early life's experiences with diversity, and investigated how these experiences influenced their beliefs about the role of diversity in science teaching and learning. This study also investigated how the experiences and beliefs of pre-service teachers changed throughout the yearlong teacher preparation program.

Included within this document is a (1) literature review discussing the importance of teacher beliefs about diversity to education, (2) discussion of a pilot study and research methodologies, (3) results that include vignettes that examine pre-service teachers' beliefs about diversity (4) thematic analysis of pre-service teacher beliefs and (5) discussion and implications.

Literature Review

Diversity in Classrooms. In today's schools, diversity takes many different forms such as: urban and rural students, teenage pregnancies, children from single parent homes, and students with various learning disabilities. These diverse subcultures, as with racial and ethnic diversity, are increasing everyday. Demographically, children of color are the majority in twenty-five of the largest school districts in the United States. It is predicted

that by the year 2,000, one third of the United States schools will consist of students identified today as minorities (David & Phelan 1993).

The increase in ethnic diversity does not compare with the expected increase in percentages for teachers entering the profession. It is expected that the current trends regarding shortages among minority and urban teachers will continue. This means that the majority of individuals who are entering teacher education are middle class Caucasian females from small or rural communities (Green & Weaver, 1992). This influx is considered a major problem, due to the lack of experience that many of these individuals have with students from different social and cultural backgrounds. These teachers will face the responsibility of creating learning environments which motivate and nurture these students. They must be prepared to meet these challenges.

Atwater (1996) states that colleges and schools of education have the responsibility of providing pre-service students with the opportunities to experience courses in which the boundaries among disciplines are suspended. She believes that pre-service students need a curriculum which includes historical, social, and cultural ideas within its context. These ideas are important because they provide pre-service students with the information necessary to challenge their preexisting beliefs, which could directly influence their abilities to teach in diverse settings.

Teacher beliefs

Atwater (1996) delineated teacher beliefs at the teacher education phase as an important area for research in multicultural science education. From her pespective, there needs to be research which focuses on the backgrounds of pre-service teachers relative to their influence on their interaction with multicultural ideas. This research needs to be ongoing, documenting changes in beliefs, as students experience different ideas over a period of time.

Although little research on teacher beliefs about diversity has been done in science education, researchers in other fields have begun to examine this area. For

example, McCall (1995) conducted a research study of the meanings that three pre-service teachers in a social studies methods course constructed about ethnic diversity and the factors that influenced their meanings. This researcher explored the interpretations that students constructed as a result of living in a "patriarchal, white supremacist classist society." These meanings, derived from students' experiences form the beliefs that the students have when they enter classrooms. For example, a Caucasian American, working-class male student, who might not have been expected to be interested in multicultural ideas, had an experience where he had observed the harm of discrimination; therefore, he wanted to resist the role of the oppressor. He readily embraced multicultural ideologies.

Two female students, both from similar race and class backgrounds, had different views on multiculturalism based on their background experiences. One student had experienced discrimination, and she accredited her experience with developing her empathetic attitude towards minorities. On the other hand, the other student had not experienced discrimination, and was ambivalent towards multicultural teaching. She did not perceive the need to incorporate multicultural ideas into the curriculum. McCall (1995) concluded that teacher educators need to understand and address the background experiences and other reasons for pre-service teachers' resistance to multicultural teaching.

Scott (1995), conducted a project examining the beliefs of teacher education students. She is a university professor who teaches an introductory education course. In this course, she included a project designed to sensitize future educators to the stereotypes and biases within society. This project consisted of two parts: an opinion survey on "Images of Ethnic Minorities," and a one-day workshop/field experience at a Multicultural Gender Fair Laboratory Demonstration Site. The opinion survey consisted of perceptions of forty-seven students from four racial/ethnic groups: Asian American, African Americans, Hispanic Americans, and Native Americans. From the survey, Scott found that the students did very little discriminating between minorities. They generally grouped them as one cultural entity.

In addition to the survey, the students in Scott's (1995) study participated in a field experience at a demonstration site. This site was student centered. The students were not required to behave in orderly fashions, and the environment was not very structured. Following this experience, the teacher education students participated in a two-hour debriefing session. From the discussions, Scott inferred that the students were resistant and had negative reactions to many of the things they observed. They expressed uneasiness with this environment. It did not resemble environments from their background experiences. The teacher education students expressed very little resistance with terms that she referred to as humanistic stereotypes, but were very resistant to issues related to empowerment. Scott (1995) concluded as a result of her study that colleges of education are not adequately preparing education students to work in diverse settings. She believes that the success of the profession depends on teachers first examining their beliefs before qualifying them to work in diverse settings.

According to Chevalier and Houser (1995), the more inclusive and empathetic one's sense of identity, the more difficult it will be to think and act in ways that oppress others. They conducted a study examining the multicultural self-development of 57 pre-service teachers during a semester in a social studies and literacy methods class. This study was constructed on the theory that multicultural self-development was attainable; therefore they used an approach that was geared towards developing a broader, more socially and culturally inclusive sense of self. There were two basic assumptions of their approach. The first was that learning and development result from the struggle to reconcile new and confusing ideas with existing understandings. New ideas are perceived as threatening to deeply rooted initial beliefs. Confronting threatening propositions requires a measure of affective safety. Few are willing or able to challenge deeply held beliefs without some form of emotional support. The second assumption was that self-development begins with social interaction and requires experience and

discussion. In other words, the broader one's sociocultural experiences, the more inclusive the development of self.

Out of the 57 pre-service teachers participating in this study, only a few of them had prior interactions with members of other sociocultural groups. Most of the students' initial beliefs were characteristic of mainstream America. Mainstream American beliefs were defined as a firm belief in the benefits of cultural assimilation, acceptance of the need to limit immigration, and blaming the disadvantaged for social conditions. The research tools used in this study were participant-observation, informal interviews, audiotaped discussions, and response journals. Their paradigm for analysis was that knowledge is socially constructed rather than transmitted by didactic methods.

In the class, the students read multicultural literature and discussed various sociocultural experiences.   The researchers reported modifications in students' perspectives and gradual changes in personal activities and self-identities. As the semester progressed, the researchers observed a growing sense of humility and increased awareness that continued their multicultural self-development. They also observed struggle and resistance from certain participants in the study. They concluded that multicultural self-development was possible.

In another qualitative study, changes in teacher beliefs, as a result of exposure to different ideas and experiences, was reported. Glasson and Lalik (1993) examined the changing beliefs and practices of six science teachers throughout a school year. The researchers reported profiles from five of the teachers, and an extensive case study of one teacher, whose initial views about science instruction gradually changed as she explored social constructivist teaching. Initially, she viewed science instruction as teaching to obtain scientifically accepted answers; however, she began to modify her initial beliefs as she explored teaching strategies focusing on student centered theories of learning .

Increasing the awareness of subtle messages, which guide individual's thinking, is an important step towards teacher effectiveness in classrooms of diversity. As evidenced in the studies, an awareness of issues, sociocultural experiences, and interactions can promote changes in teachers' beliefs. As Scott (1995) stated, teachers must examine and come to terms with their own beliefs before they can be effective in multicultural settings. They must understand how their beliefs are defined by their cultural experiences, and how these experiences differ from the experiences of other subcultures.

Understanding beliefs

Beliefs are developed during early stages of life. They occur as a result of past experiences and determine our ideas about the world. According to Richard Ross (1994), beliefs are conclusions derived from inferences made as a result of observations and past experiences. He proposes that much of the thinking and reacting occurs as a result of unconscious associations made inside an individual's head. Ross introduced a model, called a ladder of inference, derived from a discussion by Chris Argyris (1990) explaining how inferences lead to interpretations. This model illustrates how prior experiences and associations influence the inferences made during the thinking process. The conclusions, drawn from the inferences, are the observable manifestations of the meanings derived from the original beliefs (Appendix A).

According to Nespor (1987), beliefs involve moods, feelings, emotions and subjective evaluations. He submits that moods and emotions are stored in long term memory which contributes to the power of their associations. In his study, he followed eight teachers across a semester examining the influence of their beliefs on tasks. He found that some teachers' beliefs about practices in the classroom directly relate to their past experiences as students. For example, an English teacher concentrated on making her class fun and friendly because her recollections of English classes were not very pleasant. He also found teachers' beliefs to be influenced by other episodes in their lives, such as a

very influential teacher, and other work related experiences. Nespor (1987) concluded that teachers' beliefs played a major role in goal setting, and in defining and organizing tasks.

Pajares (1992) suggested that beliefs are a viable subject for study in teacher education; however, research on understanding beliefs has been scarce. Nespor (1987) contended that there were many arguments in circulation about the influence of beliefs on conceptualization of tasks. However, he asserts that little attention has been directed to how beliefs influence teachers' ideas about their roles, their students, their focus on subject matter, and the schools they work in. Pajares (1992) proposes that the scarcity of research is due to the fact that beliefs are constructs which are difficult to investigate. Researchers must first define beliefs, distinguishing them from other constructs.

Rokeach (1968) defines beliefs as inferences made by an observer about underlying states of expectancy. They are located within a belief system. He defines a belief system as "having represented within it, in some organized psychological but not necessarily logical form, each and every one of a person's countless beliefs about physical and social reality." According to Rokeach (1968), some beliefs are more important than others. Important beliefs are those which are connected to other beliefs, influencing their ramifications and repercussions. The more important the belief, the more resistant it is to change.

<u>Changing beliefs</u>

Beliefs, unlike knowledge, are stationary. Knowledge may vary according to additional information and diverse experiences. Beliefs, on the other hand, tend to maintain their suppositions unless there is a "conversion" or "gestalt shift" (Nespor, 1987). Garibaldi (1992) suggests that, in this society, teachers' beliefs about diversity have been influenced by information which reinforces stereotypes rather than disarming them. He proposes that the presentation of multicultural information is critical to

influencing teachers' attitudes (Gollnick 1992). Zimpher and Asbburn (1992) and Garibaldi (1992) recommend that an approach for confronting diversity consists of identifying biased views in forums which invites the participation of others in determining modes of intervention. Shechtman (1994) submits that these inclinations for change are viable, but expresses concern that teacher educators may or may not have the understanding necessary to foster them in teacher education, or if they would consider them vital. Teacher educators, like teachers, may be forced to ignore changing beliefs due to a lack of understanding concerning their operation.

Shechtman (1994) presents a different approach for challenging teacher beliefs, which can be incorporated into any teacher education program. This approach promotes understanding through sharing and self evaluations occurring in group atmospheres. It consists of two methods: clarifying and bibliotherapy. In the clarifying method, pre-service teachers analyze their own values and feelings in relationship to the meanings of certain concepts with group support. This forum presents the pre-service teachers with diverse perspectives. They are designed to expand upon the beliefs and attitudes possessed when pre-service teachers enter the classroom. The second method, the bibliotherapy method, uses literature to expand upon the pre-service teachers' perceptions. During this phase, students are invited to share experiences with certain characters, interpreting those feelings based on the information that is shared. This method promotes understanding and empathy by providing pre-service teachers with experiences that they might not have otherwise encountered.

Jacqueline Glasgow (1994) suggests action research as a method for changing cultural attitudes. She suggests that the reports of the Census Bureau regarding the demographic data on diversity for the future require a focus on the teachers who will be educating students. Glasgow (1994) believes that teachers will need to encounter certain cultural experiences in order to be sensitized to the needs of particular students.

She reports findings on one prospective teacher who, after immersing himself in Amish culture developed an attitude that was respectful and sensitive to that culture.

Pre-service teachers

When pre-service teachers enter the teacher education phase, they are confronted with many different issues. Housego (1990) discusses the issue of self efficacy in reference to pre-service teachers' feelings about their preparedness to teach. Housego (1990) conducted a study exploring pre-service teachers' feelings of preparation to perform their responsibilities. He compared and contrasted pre-service teachers who were instructed according to two different methods that he referred to as "old and new." At the university where the research was being conducted, the teacher education program was being revised. The old method consisted of course work plus a three week practicum in the fall, and course work plus a seven week practicum in the spring. The goal of the new program was to improve, regulate, and lengthen the experiences for pre-service teachers, as well as consolidating the supervision of programs.

Housego (1990) found no significant difference between feelings of preparedness to teach from the different programs; however, new program students felt as well-prepared to teach after three months as the old program students felt in six months. Housego (1990) concluded that the goals of the new program were communicated more effectively to the pre-service teachers, allowing them to share in them, establishing a sense of belonging. This suggests that pre-service teachers need to be connected with the teacher education system in a way that makes them feel accepted and supported.

Pre-service teachers also confront issues regarding the negotiation of beliefs. They enter the teacher education program from diverse background experiences. Their ideas about teaching have been influenced by their experiences. They are confronted with theories supported by university instructors, as well as their cooperating teachers. MacKinnon (1989) conducted a study focusing on the practicum experience of

student teachers and the socialization aspect of the experience by investigating the meanings interpreted by the pre-service teachers. MacKinnon (1989) investigated conformity as it relates to pre-service teachers, questioning whether the field experience is just a mere acquaintance to current teacher practices. MacKinnon (1989) found that the early childhood instructors involved in this study did not practice theories addressed during the teacher education program. MacKinnon (1989) concluded that teacher education faculty must become more involved with the practicum experience in order to provide theoretical foundations that will be practiced by pre-service teachers.

Zeichner and Liston (1990) discuss the socialization processes occurring within schools, suggesting that teacher education programs need to give more attention to these processes. Schools do not exist outside of the community nor are they immune to the political realms. Zeichner and Liston (1990) suggest a forum where students are motivated to examine their social beliefs. They need to be able to explore their beliefs, identifying discriminating factors or limiting qualities that might be repressive to others. They also need to be acquainted with schools' domineering tendencies to impede democratic goals.

In an interview with Jay Price, Zeichner (1992) contended that pre-service teachers need to be educated in a manner that allows them to be reflective. They need to be engaged in thinking about their roles, identifying their ideas of practice, and their assumptions about projected outcomes. Zeichner supports action research, claiming that it allows students to learn from the theory that is embedded within practice. The students are provided with opportunities to understand the culture of particular ethnic groups by actively participating within their communities. They develop respect and sensibility as a result of exposure to the real life experiences of different cultures as opposed to someone's commentary. Thus, students are able to analyze these experiences in ways that provide useful information beneficial to their future practice. According to

Zeichner, this is one of the best methods for preparing students to work with diverse cultures, at a time when it is becoming increasingly important.

Culture and ethnicity

Stenhouse (1967) introduces culture by supplying a definition provided by anthropologist, E.B. Tylor. Tylor (1967) defined culture as "that complex whole which includes knowledge, belief, art, morals, law, custom and other capabilities acquired by man as a member of society." Stenhouse (1967) continues this discussion by listing three characteristics of culture as suggested by Talcott Parsons, an American social theorist. The three characteristics are culture is transmitted, culture is learned, and culture is shared. The transmission of culture suggests that culture results from heritage or social traditions. The learning of culture suggests that culture is derived from sources other than genetic constitutions. The sharing of culture suggests that culture results from human social interactions. These characteristics emphasize the pliable nature of culture.

Enculturation through social interactions is the primary means by which culture is transmitted, learned and shared. Outside of school, students acquire culture from their homes and communities.   Inside school, students acquire culture from interactions with peers, teachers and the curricula.

Students who are entering science classrooms are not only confronting issues relating to different cultural practices, but they are also becoming acquainted with individuals from different ethnic backgrounds. Cultural practices can be shared. They flow from one individual to another, regardless of ethnic backgrounds. Ethnicity, on the other hand, is genetically determined, and for many, the responses to differences in ethnicity are accompanied by suspicion and fear.

McCready (1983) defines the term ethnicity as a social fact. He equates it with heritage and explains that it is an essential element of our self definition.   He continues by saying that the effects of ethnicity are independent of individuals' consciousness of it, and that there are two issues related to ethnicity. The first issue is

the meaning that it has for society, and the second is the meaning that it has for the people who share a common heritage.

In society, certain ethnicities are marked by stereotypes, mockery and myths, which can have far reaching consequences. These consequences not only govern the ideas and feelings that some individuals form about others, but most importantly, they can influence how some individuals feel about themselves. Having a strong sense of identity is essential to students' success and pride; and ethnic origins can play a key role in developing and maintaining positive self images.

Reflecting upon one's heritage can be beneficial. McCready (1983) discusses two major points that can be learned by doing this. The first point refers to the fulfillment of the necessity to belong. The second point refers to the strength that rests within the celebration of diversity. Individuals' lives are enhanced when their existences are legitimized by society. They are confirmed when they see representatives of themselves occupying certain roles. This need for validation should be addressed within the curriculum.

Border Crossings

Teachers are cultural workers journeying amidst the distractions of society and its political reforms, destined for a location reflecting hope and equality for all students (Giroux, 1992). To be successful, teachers as cultural workers, must engage in respectful dialogues with other members of this forum to dispel the images that have long been perpetrated as legitimate and just representations of a democratic society.

According to Spindler and Spindler (1993), culture is everything we do, say or think, in or out of school. Students are exposed to culture when they enter the classrooms from their teachers and their peers, but they also bring culture with them from their home environments. Aikenhead (1995) believes that some students entering the classrooms are crossing cultural borders, and science should be considered a subculture. He discusses cultural subgroups and explains how these subgroups (e.g. family, peers,

schools, mass media, and socioeconomic groups) influence students' understanding of science. All of these subgroups have their own subcultures. Each subculture has a set of values and beliefs that are transmitted to the students.

In science classrooms, students have to renegotiate certain of their own beliefs and ideas to conform to the values and beliefs within each subculture (Aikenhead, 1995). This can be detrimental because the domineering values and beliefs of Western science are Eurocentric. In fact, hidden within the framework of science is an invalidation and illegitimization of some subcultures, for almost every noteworthy science contributor in traditional classroom settings is a white male.

Pre-service teachers are also a part of a subculture. They enter the classrooms with a set of beliefs influenced by their subcultures. They cross cultural borders when entering the subculture of classroom science and have to make choices concerning the context of science presented in their classrooms.

Insiders and Outsiders

Tobias (1988) states that there are two groups of individuals within science classrooms, the "insiders" and the "outsiders." The insiders are students whose experiences are an integral part of the curriculum. They are able to locate and situate themselves within the educational forum. These students recognize their potential for success through the experiences provided for them within the curriculum. Students who are outsiders, on the other hand, have a different experience. They are either trying to get in, or determined to stay out. The feeling of exclusion is adamant and very frustrating, especially when the learning environment is unwelcoming and unsupportive.

Another group of individuals who are not addressed within Tobias's frameworks are a group of students that will be referred to as 'inside-outsiders." These students resemble outsiders because they are also excluded from the curriculum; however, they manage to fulfill the requirements of acceptance by the system. Their experiences are marked by a continuous struggle to identify with the few individuals from their

cultures whose contributions are mentioned in the curriculum. Unfortunately, their existences within the science arena always seem to be accredited to luck, for they are anomalies. They never really represent their communities because they are one of the few people who manage to seep through the cracks. Pre-service teachers need to be aware that students are being enculturated into the subculture of science classrooms. The pilot study discussed later offers data from students discussing the feelings of alienation experienced in the subculture of school science.

Curricular Issues

According to Gallagher (1991), teachers play an important role in forming the image of science for their students. He explains that the general public's image of science comes from the school and the media; therefore, teachers need to be aware of the viewpoints about science that are being portrayed. Science textbooks greatly influence the content of science teaching and learning. Traditional classroom settings rely heavily on textbooks, and in these textbooks, scientific knowledge is presented as "revealed truth." This representation of science is not only damaging from a multicultural point of view, but also from a scientific point of view, considering the fact that science is derived from continuous investigative and inquiry based processes.

Teachers who teach science generally mimic the instructional practices modeled before them. They learn to instruct in well structured settings where the laboratory work, homework activities, and tests parallel the content of the text. Science texts are complex, very well structured Eurocentric resources which reinforce and legitimize theories of dominance and superiority. Apple (1986) refers to these subtle messages as the hidden curriculum. Even teachers are unaware of the influences of Eurocentric resources.

Western Science

The stories of science report significant contributions of certain heritages while ignoring others. According to Hess (1995), science is a Western construct. He

considers the making of science as a social process. "Even the very cognitive assumptions behind what constitutes a rational argument, evidence, and so on are rooted in the beliefs of a specific discipline or scientific community. Thus even the cognitive or rational can be seen as sociocultural" (Hess, 1995, p. 2). Hess (1995) defines Western Science as an "ethnoscience" because it reinforces the ideas of the culture and society of its origins. He defines Western Science as a conventional narrative told as an event with all of the social factors filtered out. Western Science focuses on Old Europe and New Europe, excluding everything before and in between. All other cultures are either omitted or tagged at the end which reinforces their insignificance. It serves as the backbone of most schools' curricula. In other words, school science provides a stereotypical image of science, granting an unequal abundance of power to certain groups (Giroux, 1992). All students in the classroom need to have their experiences and their existences validated (Banks, 1992). They need to know that the curriculum respects them and addresses their needs and concerns.

Mainstream-centric curriculum

Banks (1989) refers to school curriculum as mainstream-centric. *Mainstream Americans* is the term he uses to refer to the dominant cultural group. He declares that the mainstream-centric curriculum reinforces the racism and ethnocentrism that is perpetuated in the schools and in society. It marginalizes the experiences and culture of minority ethnic groups by failing to reflect their dreams, hope and perspectives. He further states that this curriculum is damaging to mainstream students because it reinforces their false sense of superiority and gives false conceptions of their relationships with other racial and ethnic groups. Mainstream curriculum prevents students from acquiring the knowledge that can be obtained from sharing with other ethnicities. It also prevents them from having the opportunity to view their culture from the eyes of another culture, and thereby enables them to understand themselves more fully. Banks (1989) believes that schools should help ethnic minorities make smoother transitions from home

culture and community culture to school culture, by implementing a curriculum that

reflects the cultures of their ethnic groups and communities.

Chapter II

Development of Ideas

<u>Secondary Methods Presentation</u>

In the fall of 1995, I was given an opportunity to present a lesson on multiculturalism in science education to the secondary science methods class. In preparation for this presentation, I decided that I would present a case study to the students. I chose the case study methodology because it gives the participants an opportunity to explore and discuss ideas that are pertinent to the issues. I specifically selected a case study featuring a young Hispanic girl who was withdrawn and avoided social contact with other children. Her teacher believed that her behavior was inhibiting her progress in school. The students were given the case a week ahead of time. Upon entering the classroom, they were grouped and asked to discuss the case, making a list of the important issues. I recorded the responses as they were provided by the students.

One of the things that stood out most in the discussion was the level of resistance from one of the students within the class. He was a young white male cadet. He consistently compared the issues within this case about multicultural education to affirmative action. No matter how much the issues in the class addressed some of the disadvantages faced by the student, he perceived the student as wanting handouts. That was my first experience with blatant resistance. It helped me to realize how much the success of multicultural education depended on teachers' beliefs.

The decision to focus on pre-service teachers was inspired by this presentation. The cadet's disposition was alarming. He not only expressed strong reactions to the idea of multiculturalism, but to other issues such as discipline and classroom management as well. I realized that his experiences definitely influenced his beliefs, and from the discussion, it was clear that these experiences extended beyond the training for his military career.

Pilot Study

Prior to this dissertation research, I conducted a pilot study focusing on the experiences of minority students in science classes (Brand & Glasson, 1996). The data for this study was transcribed and organized into categories and themes (Ely, Anzul, Friedman, Garner, & Steinmetz, 1991). Three themes emerged during the analysis. They were: (1) Barriers to enculturation in science classrooms, (2) Learning preferences in the science classrooms, and (3) Developing student teacher relationships (Appendix B).

The students' responses from the pilot study inspired me to focus more on the teacher and the teachers' role in constructing the relationships within diverse settings. Throughout the pilot study, students expressed the fact that their success in classrooms was influenced by more than the teachers' abilities to impart knowledge. They informed me that they did poorly in classes where they didn't have good relationships with their teachers. They claimed that when they had good relationships with their teachers, they wanted to do well in order to please the teachers. These statements indicate that teachers play an important role in determining the success of students.

Summer Institute

After the data from the pilot study was transcribed, it was organized into a multimedia portfolio. This portfolio was presented at a two week teacher institute in the summer of 1996. The teachers were given an opportunity to provide feedback on the presentation. Their comments were expressed verbally and in writing. Here are a few of the written comments from the teachers.

Teacher #1 made this comment:

> At first I felt like this session wasn't for me. I don't have a lot of experience with minority students (other than girls). However, I could still relate several things she said to mistakes I have made in my classroom. For example, if we inquire from another teacher their feelings about a student in our class before we start, then we will have formed a previous opinion that may prejudice us against that

student. I now realize that every student should be allowed to start on equal

ground to prevent misconceptions.

This comment expresses the broader perspective of multiculturalism. The teacher recognized that the process of multiculturalism extended beyond racial and cultural boundaries to encompass all of the occurrences within the classroom which could contribute to some form of discrimination.

Teacher #2 made this statement:

Multicultural was already a pressure for me-mostly self developed. . . . My minority students are primarily African American-this past year 7 out of my 78 students were black and of those seven three were males. I wanted to make them more than they'd ever been before, and that they were on an exactly equal footing as all my students. I know that one had never been loved and cared for by a white teacher before. He told my daughter.

This comment caused me to think about student-teacher relationships. I wondered about the relationships that the above mentioned student had with other white teachers. I questioned what made this student feel loved and cared for, and why this student had not felt this way prior to entering this teacher's classroom. I also wondered what she meant by "making them more than they'd ever been before."

In conversations, some teachers expressed a need for the portfolio to address other aspects of diversity, such as levels of performance, regional and socioeconomic differences. Others expressed appreciation for the sharing of the views of minority students and expressed a desire to receive more information. One of the most memorable comments that I received was from a white male instructor. After the presentation was over, he came up and thanked me. He informed me that he just didn't know. He expressed to me that the portfolio had definitely influenced his thinking. I thought to myself how this teacher might also have been misunderstood by some of his minority

students. Some of his students probably perceived him as uncaring and uninterested, which according to his comments were untrue.

After the institute, I began to reflect on the impact that this presentation had on some of the teachers. I realized that the presentation was based solely on the sharing of experiences from minority students. The teachers were motivated to reconsider their beliefs by listening to a few minority students express their voice, discussing the frustrations they face before and after entering science classrooms. It was enlightening to see how the communication from the students influenced the teachers' understanding.

As a result of the feedback from this institute, I decided to include within my research, a broader spectrum of diversity to address the teachers' concerns of diversity stemming from students of different academic levels, geographic regions, and socioeconomic backgrounds. As a result of data from the pilot study regarding teacher relationships, I decided to focus my attention on the beliefs of pre-service teachers. Also, in addition to interviews, I included the portfolio as a means to elicit pre-service teachers' beliefs about diversity.

Included within the following sections is the purpose, questions and data for this study, the methodology, the rationale for choosing the participants, and the five vignettes of the pre-service teachers. Also included is an analysis of data and interpretations of the study and implications for future research.

<center>The Study</center>

Purpose and Questions. The purpose of this study was to explore how pre-service teachers' life experiences influenced their beliefs about the role of diversity in science teaching and learning. This study also investigated how the pre-service teachers' beliefs changed during the teacher education program.

The following research questions guided the study: (1) How did the experiences and beliefs of pre-service teachers from different culture and ethnic backgrounds influence their ideas about the role of diversity in science teaching and learning, and (2) How did the

beliefs of pre-service science teachers change throughout a year long teacher preparation program?

<center>Participants</center>

While participating as a graduate assistant in a secondary science methods course, I had a distinct opportunity to observe the dialogues and interactions of ten pre-service teachers. I was inspired by the voices represented within this class.

These pre-service teachers motivated me to think about the data received from the pilot study, which focused on minority students' perceptions of the barriers they face when entering science classes. The data from this study overwhelmingly indicated that the classroom atmosphere was an important factor for determining minority students' success. More specifically, teacher relationships were identified as one of the primary factors influencing their achievement.

With this study in mind, it was enlightening to observe events as they occurred in this methods class daily. What I found particularly interesting, was the manner at which the dialogues and expressions from students, who were around the same age, majoring in similar fields, reflected a multiplicity of views and approaches to education. In my opinion, these views reflected the experiences of each individual as a result of enculturation within their distinct borders. I was then inspired to examine how the different cultures influenced the beliefs that supported premises taken and expressed by these pre-service teachers. Also, I wanted to explore how these beliefs manifested themselves in the choices they will make in the classroom.

<u>Reflections on classroom discussions</u>

During the observation period, I listened to the pre-service teachers' commentaries in classroom and group discussions. The most influential classroom discussion occurred as a result of a guided imagery exercise which required students to focus on their years in science. One of the students, Kyle, a Caucasian male, from a rural setting, discussed the difficulty he had in being declared capable of learning science, and expressed how

<div align="right">22</div>

discouraging these negative experiences were for him. The mode of his discussion clearly expressed the resentment that he had towards the individuals responsible for making those decisions about him. Another student, Jerry, an African American male from an urban setting, discussed an experience somewhat similar to Kyle's. He discussed the difficulty that he had convincing teachers and administrators that he could be successful in science classes. He spoke quite comically about it, often chuckling during the dialogue, with less emotion than Kyle. His expressions almost gave the impression that it didn't bother him. Prior to this guided imagery activity, I noticed during other class discussions that Jerry would provide very short answers to questions, and would speak only when asked, while all the other students freely expressed their views throughout the discussions.

By the end of the activity, I was inspired by the discussions of these male students. They were very different individuals with similar experiences. I began to wonder how their experiences would determine their beliefs about teaching, and how these beliefs would be expressed in their decisions for their classrooms. I immediately presumed, based on their conversations, that these pre-service teachers' beliefs about teaching science would reflect a more empathetic point of view.

As this activity progressed, I listened as other students in the class discussed different experiences. The discussions of three more pre-service teachers demanded my attention. These individuals seemed very secure and very opinionated. They dominated the discussions. While writing notes, I noticed that their discussions seemed to have expressed a common theme, for they described the classes that were most memorable to them, and explained why they were so memorable. Their discussion focused on issues such as instructional methodologies and teacher effectiveness.

The first student, Josh, an Asian male from an urban setting, portrayed a demeanor which might have been interpreted as arrogant, yet very secure. He spoke often during the discussions, making very bold statements and cynical remarks. He expressed

very rigid views. From his comments on his high school experiences, it was evident that he had experienced a very successful academic career in high school.

The second student, Tabitha, a Caucasian female from an urban setting, seemed very insightful. She shared a few interesting stories of her own. Tabitha seemed very self-confident, and quite comfortable in this forum. She did not mind asserting her voice to be heard whenever necessary. She had much to contribute and did not hesitate expressing her views.

The third student, Cedric, a Caucasian male from an urban setting, also demonstrated a very secure, confident demeanor. This student, like Josh, dominated the discussions, often making statements that would startle his counterparts. He had no problem openly challenging the views of his peers, especially when they disagreed with his philosophies. What impressed me most about Cedric was his idealistic view concerning his impending role as a science educator.

By this time, my curiosity was aroused. The views discussed by the pre-service teachers within the classroom represented a broad range of experiences. All of these individuals were crossing cultural borders when they entered this classroom. I thought it would be important to find out what happens when students from different cultures cross the border to become science teachers. For this reason, the five students discussed above, who sparked my interests, seemed to be prime individuals for exploring answers to my questions. I resolved that these individuals might be able to shed light on the issue of classroom relationships, as discussed by the participants from the pilot study.

By the end of this day, I had began to ask the following questions: how do the diverse enculturating experiences from the home, school, and community cultures influence teachers' beliefs, and how do these teachers' beliefs influence instructional practices? These issues marked the beginning phase of my desire to focus on the importance of teacher beliefs about diversity in relation to teaching science.

<u>Reflections on students' writings</u>

After the class discussion, the pre-service teachers were asked to write a paper discussing their beliefs about teaching. Although I enjoyed reading the papers of all the students, I focused more attention on the five students mentioned above. What I found particularly interesting was how the pre-service teachers' experiences discussed in class seemed to influence the ideas detailed in their papers. For example, the following statements were taken from the paper submitted by Kyle:

> Teachers have an impact on their students whether they realize it or not. One comment or reaction can cause a child to decide if he/she wants to learn the material or not. Teachers have that power, so I believe teachers must be cautious about the power they yield. . . . Everyone has one common need and that need is love and caring.

Kyle addressed the impact that teachers' perceptions can have in the classroom. He discussed the power that teachers possess to either encourage or discourage their students. Kyle's expression of student needs emphasize caring and understanding.

Similar statements were made by Jerry in his discussion on his beliefs about teaching:

> As I stated earlier, teachers are the second most important people who are involved in the development of a student as a person. I realize that teachers are human also, but if they could set aside any personal views such as race, religion, and discrimination, they could single handedly determine the outcome of a student's development. . . . Lastly, I believe that anyone who wishes to teach one day should invoke some compassion. The reason I state this is because if one does not have compassion for others, how can they teach others. Compassion brings on a sense of caring for your fellow man, and in caring for someone else you care about their development.

Jerry, like Kyle also emphasized caring as a need for students in the classroom. Jerry stressed that teachers needed to dispel personal proclivities which would interfere with them providing positive leadership for their students.

Tabitha creatively expressed her ideas about teaching in the form of poetry. The following statements were taken from her discussion about teaching:

Teaching is learning and helping to learn, loving to learn yourself and helping others to love it too. . . . Recognizing the poet and artist and thinker and creator in all of us and that we all are different in how we express it.

Tabitha's comments, like Kyle and Jerry, emphasized that students have a need to be confirmed. In Tabitha's expressions she also discusses the fulfillment that teachers can receive from not only helping their students to learn, but by also being a partner in learning.

The following statements were taken from Josh's commentary on his beliefs about teaching. His statements addressed a more cognitive approach to teaching:

People learn best when they hold information in their short term memory and process it. The more they manipulate the material, the better they will be able to sort novel ideas into their previously learned knowledge. The active organization of the new data will usually lead to better structured memory. . . . People do not learn well by rote memorization because there are no connections to previous knowledge.

Josh's perceptions about teaching reflected an understanding of how people learn. He believed that an understanding of the process of learning is pertinent to being a good teacher.

Finally, these statements were provided by Cedric. Cedric's statements, resembled Josh's in that they related to how students process learning; however, his statements also focused on making learning interesting for students:

The teaching of science in US schools need to be revised. There is currently too

much emphasis placed on form and not enough spent on creative exercises. Once

a student is shown that science need not be dull and monotonous, then they

should be taught how to organize their ideas and how to present them properly. ...

Many times a textbook is used exclusively when resources from the community or

school itself have not been tapped. Students will learn much more when they use

more of their senses. The key is to involve them and not talk to them.

Cedric believed that learning would be more meaningful to students if they were engaged,

rather than always being lectured to.

The diverse perspectives provided by the pre-service teachers led me to believe

that there was much to be learned from them. I believed that the information obtained

from these individuals would be useful for teacher education.

Thus, these five pre-service teachers were selected as participants for this study.

They were as following, an Asian male, a White female, an African American male, a

White male from an urban setting, and a White male from a rural setting. The students

were asked to sign informed consent forms (see Appendix C). These pre-service teachers

were followed throughout their teacher preparation observing and noting any changes in

their initial beliefs as the year progressed.

Data Collection and Analysis

Data for this study consisted of written papers, as required by the two secondary

science methods courses, and weekly activity logs and reflections, which were also

required by the courses. Data also consisted of audiotaped interviews, journal field notes

of observations and students' responses, and videotapes of instructional practices.

The pre-service teachers participated in three audiotaped interviews. The

interviews were from thirty minutes to an hour in duration. They consisted of open-

ended questions in an attempt to promote an open discussion of experiences and beliefs

(Appendix D). The first interviews were conducted during the week of September 23,

1996, prior to the fall semester field experience. The focus was to examine the influence of pre-service teachers' life experiences on their beliefs about the importance of diversity. These interviews focused on the pre-service teachers' background experiences in an attempt to relate the experiences of the pre-service teachers to their initial philosophies.

The second interview was conducted at the end of the student aiding experience. The purpose of this interview was to examine the pre-service teacher's beliefs after they performed certain functions within the classroom. The responses from this interview was compared to the initial responses, noting any changes in the beliefs.

The third interview occurred after the pre-service teachers were presented with the multimedia portfolio on multiculturalism in science education, before they began student teaching. The focus of this interview was to determine the influence of the dialogues from the females and African American students on the teachers' beliefs. The responses from this interview were also compared to the initial responses, identifying changes in pre-service teachers' beliefs.

The final pieces of data consisted of informal interviews and a reflective writing assignment. In the informal interviews, the pre-service teachers provided their commentary on the events of the year, and in the paper, the students discussed the most rewarding experiences they encountered during their time in the field, and the information gained from them. The goal was to identify changes that occurred as a result of the pre-service teachers' perceptions of their development throughout the year. All interviews were transcribed, information coded into categories, and organized into themes (see thematic analysis).

Interviewer's log

An interviewer's log was kept throughout this study (Ely et al.,1991). This log consisted of the reflections, thoughts and reactions of the researcher as the data was collected. The interviewer's log was an ongoing analysis of data. It consisted of descriptions of occurrences as observed by the researcher (Lincoln & Guba, 1985) such as

participants facial expressions and gestures while being interviewed, and also for recall of other information discussed by the participants at times when they were not being interviewed. This log established the self as instrument by causing me as the researcher to create meanings as the data was collected, recognizing that data alone has little value. It was used to tell the stories during the writing phase and analysis of this research.

The information in these logs was also used to construct future questions, and to identify areas requiring additional information. The participants were informed of the possible need for the researcher to reenter certain interviewing sessions for further clarification or additional information. The researcher also offered feedback to the participants, sharing information and observations from the study.

Trustworthiness and establishing credibility

According to Lincoln and Guba (1985), trustworthiness is the researcher's way of ensuring that the research was fairly conducted, and that the conclusions closely resemble the participant's experiences. Trustworthiness ensures the audience of the research that the results can be accepted according to the variables identified within the study. In order to establish trustworthiness, the research has to be credible. It has to be conducted in a way to ensure that researcher's biases have not interfered with the results.

Lincoln and Guba (1985) have identified several actions that should be taken to ensure that the results are believable. They are as follows: prolonged engagement in the field, persistent observations, triangulation, search for negative cases, peer debriefing, and reentering the field. These will be discussed according to their roles in this research in the following sections.

Prolonged engagement and persistent observations. Data collection for this study occurred throughout the school year. The participants were followed throughout their teacher preparation for two semesters. This provided adequate time to reenter the field to receive clarifications or to follow up on observations.

Triangulation. Triangulation is the way at which qualitative researcher's ensure that their inferences and conclusions are adequately supported. The concept of triangulation requires the researcher to collect alternate forms of data, making sure that the findings appear in more than one piece of data. Through triangulation, the researcher does not only identify repeated occurrences, but also occurrences that happen by chance.

In this study, the criteria of triangulation was satisfied by the different forms of data that was collected. They were audiotaped interviews, informal discussions, written papers, activity logs, and field notes from observations. These sources were considered collectively in the analysis phase of this study.

Negative case analysis. According to Lincoln and Guba (1985), negative case analysis is the identification of disconfirming evidence. This evidence is used to assess the ongoing conclusions. Negative case analysis provides the opportunity for the researcher to reconceptualize categories and themes, to determine credibility. The researcher must be willing to accept the challenges offered by disconfirming evidence, especially when it means a change in expectations or opinions.

The comparisons made between the information provided by the participants at each stage of this process presented the opportunity for identifying discrepancies in perceptions on the part of the researcher.

Peer debriefing. In order to establish credibility in a qualitative study, peer involvement is important. The type of study and the methods of analysis for this study, require the input of an outside researcher to avoid reporting biases. Periodically, reports were made to the peer debriefer. The faculty advisor was the peer debriefer for this study. In these sessions, the debriefer reviewed and discussed information, identifying and questioning conflicting evidence and opinions. The researcher, in consultation with the peer debriefer, decided upon the categories and themes which were reported in the analysis.

Reentering the field. Reentering the field or member checking (Lincoln and Guba, 1985) is simply checking the interpretations with the individuals who provided the data. This process allows the researcher to be sure that the conclusions inferred from statements are accurate. It allows the researcher to clear up possible misconceptions that could occur as a result of interference from the researchers' beliefs. The addresses and phone numbers of participants were retained throughout the analysis of this research study, in the event that information needed to be clarified. The participants were provided with an opportunity to clarify and elaborate on information provided.

Thematic Analysis

Analyzing data, is finding the meaning within the raw data (Ely et al., 1991). It is presenting the research in a way that allows the readers to share the researcher's findings. To accomplish this task, the data from this study was coded and organized into emerging themes from categories. The categories were taken from the interviewer's logs, students' papers and transcribed interviews. Links were identified between the categories and used to establish themes. Trustworthiness was an important consideration during this phase of the analysis.

Results

In the analysis phase of this study, vignettes were constructed, telling the story of each pre-service teacher separately. The data supplied by each individual was organized into a story, depicting the experiences and beliefs of the pre-service teachers as they occurred throughout the year. After writing the five vignettes and organizing the data into categories and themes (Ely et al.,1991), the experiences and beliefs of each of the five pre-service teachers were considered in relationship to each other, identifying any commonalties and differences between them.

Chapter III

Vignettes

The five pre-service teachers from diverse cultural backgrounds shared experiences of the cultural influences responsible for shaping their belief systems. These vivid accounts reveal the formation of the boundaries which are protected by the cultural borders. Within these dialogues are periods of confusion, insight, and enlightenment. These experiences impacted their thinking as they journeyed between subcultures.

Included within the following sections is a discussion of the experiences of the pre-service teachers prior to entering the teacher education program in the fall of the year. It continues with discussions of their experiences before and after the field experience in the fall, and before and after the field experience in the spring. Also included are discussions of their reactions to the portfolio.

Josh

Strong work ethics

Josh is an Asian American male who was born in Vietnam. He came to the United States at the age of six. He was raised in a two parent home. Both parents worked, and education was highly emphasized. Josh was raised and attended schools in suburban areas. Josh said that his parents came to this country with nothing. He said they worked as janitors cleaning toilets, and worked up from there. He was proud of their accomplishments. Josh spoke of attending schools consisting of mostly upper middle class, predominately White students in an area known for its high educational standards.

In high school, Josh was in higher track science courses. He described his experiences as rising to the top for the sake of getting to the top, and being disappointed after getting there. As an Asian, he believed that he got a lot of biases in his favor. He said that he was automatically assumed to be smart; however, he believed that he had a natural understanding of things and was always able to answer the most difficult questions satisfactorily.

There were several experiences in Josh's life that influenced his perceptions on diversity. He spoke about a bus stop series of incidents where he was antagonized by White and Black peers who were also waiting on the bus. He explained that at this time, his family's income was somewhat low; therefore, his attire consisted of usually second hand clothes. That situation, in Josh's opinion, made him a target for peer teasing. He explained:

> First our clothing didn't fit because all the clothes we wore were from yard sales from the seventies and people made fun of that. There was an economic difference along with it being ethnically different. . . . But pretty much a White atmosphere. Pretty well to do, upper middle class. . . . It was the White students who tended to pick on me for economic status. The Black students vented [referred to him ethnically] being Asians.

Josh later explained that the reason why he used the term "vented" with the African American students is because he believed that their treatment of him was in response to how they had been treated by White students. He believed that the African American students perceived he and his siblings to be less than they were.

Josh discussed another experience which further influenced his thoughts on diversity. This altercation caused him to question his identity as a "minority" in society. His high school newspaper reported the arrest of a former student and football star, who was a minority, for distribution of drugs. Racial tension developed as a group of African American students, including the minority resource person for the school, protested against the report. Their argument was that similar offenses had occurred earlier with Caucasian students, but it was not reported in the paper.

The school newspaper representatives said that the reason for the report on the behavior of the African American student, was the age of the perpetrator. The African American student was eighteen years old, and the other students were minors, whose names could not be published legally. This explanation satisfied Josh and apparently a

majority of the White students, but not the African American students, or the resource person.

Josh openly made comments against the perceived hatred that he felt emanating from the resource person. According to him, his comments were deliberately misinterpreted by the African American students involved. This situation escalated until it had to be addressed and defended in several scheduled meetings after school with the school administrators. Josh explains:

> And it was always point blame. Unfortunately, it [the meeting] was also run by peer counselors, and they felt it was appropriate that the Black peer counselor would run this, and she had a great influence on them. So they in turn distributed the blame. At one point, it was a discussion about, it was also Black history month which added to the tension. It was pointed that, somehow I was quoted as saying Blacks should go back to Africa, which I never said, and she repeated this. The other students and the peer counselors repeated this. So they took it as an official confirmation that I said it, and that just increased tension in the school.

Josh concluded that his voice had no validity in this situation. He resolved that it would be useless to continue to defend his position. He felt that there were racial divides, and he would always be considered in support of the Caucasian students and their views.

Josh said that he realized that he was not considered a minority at his school, and in the process of defining the term, he recognized that he was having difficulty classifying himself as one:

> Minority it seems like by definition would be some individual of an ethnic group who in number is less than the majority. . . . Some people don't like referring to Asians as minority because in that case, they are thinking of minority as in terms of I guess test scores and achievement compared to other minorities. I don't like that definition because whether they like it or not, minority and majority is based on a number thing. Well, one has more people than the other.

The term "minority" as a label was constantly alluded to, yet at the same time, avoided in Josh's explanations. He realized, in his attempt to approach the term in a politically correct manner that there were overwhelmingly negative connotations associated with this term in society. He expressed his thoughts, struggling with a desire to avoid acknowledging the negative stereotypes.

In personalizing his thoughts on the term minority, Josh was met with a dilemma. He realized, during his explanation that a conflict arose between his understanding of the legal definition, and his background and status at high school. Josh explained:

I think I'm even at the point where I don't consider myself minority just because when you asked that question, my first reactions was, "who were the Black students in my class?" I thought that was interesting. Including myself, my AP chemistry class had two, including myself, if I was counted. But being from that high school and being from that background, see again, I'm sort of taking from, I'm going against my own definition of minority. And I guess that does make sense.

Josh recognized that he considered the term "minority" a label, a label that he resisted, and was reserved for certain individuals.

Even though Josh shunned this term, he discussed one incident in his life where being labeled a "minority" would have been favorable and profitable to him. This incident involved the only Black student enrolled in his AP chemistry class. Apparently, a minority scholarship was being offered at his school, and Josh decided to apply for it. Josh continues:

I just remember in that case I was a little annoyed at the scholarship thing that they had because when I applied for a minority scholarship, I got a letter back, which now I regret that I ever sent. I regret I didn't keep it. It basically told me, no you're not a minority. This is a Blacks only student scholarship, and they didn't consider me a minority. I thought that was interesting because when I looked at the qualifications, it looked like I would qualify. She got a full

scholarship, and right about the same time. And so I remember that, I was like

whoa! I thought I was a better student.

For Josh, having the choice of being considered a "minority" was advantageous. He talked

about being an Asian American and the benefits he received. He spoke of biases that he

received in school because of the expectations that teachers had for him. According to

Josh, he received an A one semester in a class, and did not turn in the paper. That paper

was the only grade for that period.

Josh said that the treatments that he received in some of his classes were based on

perceptions that the teachers had of him as well as the manner at which he conducted

himself:

It's the same way. It's a double standard. I got a lot of biases in my favor along

the way, and if I cheated and two people got caught cheating, he would lose a

grade, on his quarter grade. He would be dropped one from his quarter grade. I

would be told not to do it again.

Josh believed that the stereotypes about Asians, such as their high intellectual capabilities

and diligent work ethics, worked in his favor. He presumed that the esteem awarded to

such characteristics within this society, afforded him a more plausible status. As an

Asian American within this society, Josh considered his identity to be adaptive, void of

the need to demarcate cultural inconsistencies:

On paperwork, I think it's Asian. I never think of it in those terms. For a

common background, I think I use Asian, but when I think of myself, I don't I

mean I fit in that category and situation, but I in the day to day, I just think of

myself as another person. And I think that has a lot to do with the fact that I sort

of see the world from a White perspective. So I don't see myself as Asian. I see

myself as Josh.

Josh believed that his ideas about life resembled those of his White peers. He considered that zone to be a comfortable and more inviting place for him. It was with those individuals that he received nourishment and reinforcement of his values and ambitions.

Much of Josh's experiences with diversity were very confrontational in nature. He discussed how his perceptions differed from the minorities, which in this case were the African Americans at his school:

> Yeah, you watch the news. You hear it's always black power and white power. That has always bothered me, how I couldn't be critical of a black person. . . . I don't like to think of people as a group, but yet somehow whenever it comes down to that, that's what I end up doing.

Josh recognized that his perceptions were not void of the influences of societal stereotypes. Although he wanted to resist the images, he found this task difficult to accomplish.

From Josh's viewpoint, a battleground existed at his school, and in his mind, he joined the army of the majority because his philosophies and ideas were more compatible with the majority. Josh's perspectives on the role of diversity in the teaching of science reflected these experiences. His discussion of the influence of diversity on instructional practices and curriculum mirrored his momentous past. His perceptions of the purpose of a multicultural focus in science education centered around combating and calming racial tension. If there were no racial disturbances, then there were no disadvantages, and no need for intervention.

Thus, Josh believed that diversity should be addressed within the curriculum, solely to prevent biases that might be considered offensive. He considers it as a measure for preventing possible interruptions in learning:

> It's trying to, if you teach a lesson, one you have to make sure. . . . it doesn't set any one group of people as, one you try not to set one vs. another, you try not to put one down. You try not to get any negative or aggressive feelings

emotions, stereotypes, beliefs involved. You don't want to inhibit any one

students' learning because they are reacting to a statement as opposed to reacting

to the material.

Josh's experiences determined his focus. The battlegrounds, that he alluded to in other

statements, caused him to think about diversity in terms of conflicts and aggressive

behaviors.

As a result of these experiences, he has developed a corresponding view

concerning his role as a teacher in a diverse classroom setting. Josh explains:

As I've been saying, from my point of view. It seems like for me to teach

Chemistry and Math, it's important for me to be aware of making assumptions, be

aware of making statements that might be offensive, or cause a reaction that might

inhibit the learning. But in that sense, it would influence my presentation and the

way I go about teaching something. But to go out of my way, I don't want it to be

the point where I'm going out of my way to present one point, or specific

minority's point of view just for the sake of multicultural education.

Josh's experiences with the integration of diversity within instruction at his high school

was mostly supplemental ideas added to the curriculum. A few facts addressing diverse

ethnic contributions were added to the curriculum, in his opinion, to appease a certain

sector of students. He perceived this process as useless, considering it an annoying

distraction.

According to Josh, an emphasis on diversity had the potential to interfere with

more important occurrences within the classroom, like instruction. As far as he's

concerned, when he is a teacher, his primary responsibility is to make sure that he doesn't

make any offensive statements that might be distracting to some students, preventing

them from concentrating on learning. He explains:

If it fits in appropriately with teaching the material, what we consider facts, what

we consider the right way of approaching a problem, or the best way of

approaching a problem. Then that's just a part of teaching. But to go out of your way to change what you think is the important part to your curriculum, just to add another part so that you can be politically correct. That is taking away from students' learning.

Josh reveals a conflict between multicultural education and his beliefs about teaching. His perceptions of teaching and learning consisted of students learning scientific theories and facts. Throughout the discussion, he indicated this as a priority for his instruction, and his ability to accomplish this would aid him in determining his success.

Multicultural education was perceived by Josh to be an addendum to the curriculum designed to appease a particular group, as opposed to the whole, much like his minority resource group at his high school. In his discussion, he remarked that the group was jokingly referred to as the "Black student association." Along those same lines, Josh resented Black History Month at his high school. His objections to this was quite similar to the "minority resource group." He saw it as an attempt to appease a certain group of individuals, having no validity at all.

When speaking concerning the acknowledgment of Black History Month, Josh made the following statements:

Okay, February, Black History Month, that was the extent of Black history. We had to go sit and watch movies. We would have to have discussions afterwards. It was like, wait why do we have Black history? That's always the argument. Why don't we have all the other histories? Why is Black so special? They call themselves minorities but yet they have so many more in population than say an Asian. So, are they really a minority or are they just putting themselves in that position?

Josh perceived the recognition of Black history as discrimination. He felt that by acknowledging Black History Month, favoritism was being shown to Black students.

Regarding the the integration of diversity into his instruction, Josh had very strong views concerning his role as a practicing teacher:

> It's my class. I do what I want. You don't like it, fire me, and I'll walk. You're not going to make me do multicultural if I don't agree with a principle, or if I don't see it as being beneficial to my students. If you suggest ideas and methods and approaches that I feel will help my student, will help them appreciate the material more, engage them. The net effect is will it make my students better?

Josh's methods of explaining his role as a teacher mirrored the approach he used to deliberate past situations. He was very defensive. The battleground was evident. His weapons were his principles, bred by his life's experiences.

The essence of what Josh considered to be important to teaching science, was derived from his background. When discussing science teaching, he emphasized the digestion of scientific facts and theories. He explained:

> I seem to think there's a right way to think, and there's a wrong way to think. That doesn't mean there's only one. I mean you can see things from a different point of view, but there's still one scientific right.

Josh continued by saying there is a system in this society that we accept. There are various interpretations; however, they all must somehow divert to that system.

Josh made the following comments regarding the science that was taught at his school:

> No, I didn't at the time, now trying to remember, it's hard to but I didn't at the time think about, is this statement a bias or not. Would this inhibit a minority from learning this material? Didn't think of it in that term. I thought it was all knowledge. It was thinking. It was knowledge. It was reasoning.

Josh perceived science to be free of culture, values, and principles. It was a process which focused on developing students problem solving skills, reasoning abilities. and analytical skills.

When Josh spoke about his high school science years, he spoke about fifteen point curves, and how he never came close to needing them. He spoke proudly of an exam in his senior instrumental analysis class where he answered a very difficult problem correctly, that he was initially unsure about. He said that his classmates turned in a much greater amount of work on this problem than he did, and he answered it correctly. He resolved that he had an intuitive nature about science, derived from a general understanding of the material. From that perspective, he explained his philosophy for teaching science:

> To learn something, you have to take it in your mind. You have to play with it until it fits with what you know and the way you see things, so that it becomes one with the way you think. . . . So, it's a way of thinking things through, what makes sense playing it out, and it's connecting it with what the background is. If it's an isolated piece of information, it becomes that.

Josh said that connections have to be communicated to the students, and he was quite confident in his abilities to help all of his students understand the connections. He believed that if the students worked hard, and were committed to learning, they would be successful.

Josh's approach to teaching science stressed a rigid concentration on learning scientific facts. As a result, the students would be able to apply the facts to other scientific problems. He emphasized that Chemistry consists of a sequential order of concepts. It is pertinent that students be successful at each skill to successfully advance to other levels.

Unexpected challenge

Intimidated is how Josh described his feelings on the first day of his field experience. He explained that after entering the middle school his first notion was to proceed with caution. The ethnic make up of the faculty and students differed so much

from his own background experiences, that it greatly concerned him. He wondered if his ethnicity would interfere with his ability to fulfill his responsibilities there:

> When I observed the ethnic make-up of the SMS student and teacher population, I became cautious. However, I quickly learned that I had no reason to be concerned. The students accepted me without exception. They welcomed me into their classroom and expressed the desire to have me help them with their learning experience.

Josh explained that his anxiety was later calmed after he began interacting with everyone. He was convinced that he was going to be given the opportunity to earn their respect based on merit.

The small population of ethnically diverse students and faculty at this school was very different for Josh. He was accustomed to seeing a larger percentage of individuals from diverse ethnic backgrounds. He was concerned that the absence of individuals resembling his ethnic background could mean that the students might not feel that they could relate to him. However, in noting the lack of minorities, Josh did not perceive any difficulties in fulfilling his responsibilities in this setting. He explained:

> When I walked into SMS, it was all White female teachers, all White students with the exception of two Black students, and they always stuck out, even if they were quiet. . . . In a sense, it seemed like a positive thing for them. It seemed like they hadn't been taught to hate, or taught to judge each other by differences. Because there weren't enough to go around I guess, or there wasn't any friction there. They were just students and I was just another teacher. They found they could relate to me. There wasn't any negative reactions. There wasn't a prejudice, it didn't seem like.

Josh's reactions to diversity in this setting appeared to be fueled by past experiences. He portrayed the African American students as potential demonstrators, saying that they had not been taught to hate. Unlike the African American students from his high school,

they had not been informed of a cause, nor had they been organized against issues.

Besides, their abilities to organize were limited due to under representation within the

school. This, Josh considered to be positive for these students because they weren't

agitated or irritable. From his perspective, there were no disturbances, so there was no

need to address diversity.

After a few days of observations, Josh formed clear opinions concerning the need

not to address diversity at this middle school. He explained:

Was this issue [diversity] addressed? The teacher didn't. In this science

classroom that wasn't dealt with. Did there need to be. . . . The way it seemed like

they handled it, and I seem to agree is that there were other issues that were more

important that they needed to deal with in terms of handling, classroom

management and working inclusion into it. . . . Maybe if it was a conscious effort,

it could be probably worked in, but I wouldn't prioritize it over things.

Josh believed that the teachers faced other issues, in their daily tasks which took

preeminence over issues relating to diversity.

Feeling good about his treatment at the school, Josh submitted a letter, (Appendix

E) commending them for the warm atmosphere he experienced while working there. He

felt that he was fairly judged according to what he did at the school, rather than who he

was. He elaborated:

From my first day to my last, the faculty, staff and most importantly, the

students made efforts to help me feel that I was a valued member of SMS. No

single person acted in a manner that made me stand out as being different because

of my ethnicity. I was judged by the way I conducted myself, my devotion to

teaching, and my love for the students and their learning.

Josh's compliments were graciously received by the teachers, so much until they

forwarded it to the administration. Josh believed that this school had successfully

fostered a tension free atmosphere regarding race and gender equity.

After the letter was submitted, during his last days at the school, as Josh was walking down the hall, a student made an ethnic slur directed towards him. This incident caught him off guard because by this time, he was relaxed and feeling very good about his experience at the school. This incident alarmed him, provoking much thought about the role of diversity. He explained:

> It was interesting because I had my guards down and was totally, completely relaxed at the environment. It kicked in, kind of a defensive mechanism that I'd built up over time to sort of filter things like that out and not pay attention to them. And it was an interesting alarm reaction, it was like all these walls clammed up immediately. And I was shielded.

Josh said that his reaction to this situation, which was to remain silent, was a response which was quite familiar to him. It reminded him of the bus stop incidents. Remaining silent was the technique that he used to disregard statements made by his peers. This experience left Josh with a different perspective of the role that multicultural education should play in the science classroom. He explained:

> It's made me aware that even in situations where it seems like it's perfect, that you don't need to deal with it. But to be truly responsible educators, we have to realize the students at some point in their lives are going to face diversity. And yes, you don't have to deal with it because it's not a classroom management problem, but it is something you should make the students aware of. So that when they find the situation, they handle themselves appropriately. I guess for a long time I had a negative stigma with multicultural education. Somehow I associated it with teaching of hatred, teaching of disliking differences, but now I guess I'm taking it to the point where I'm redefining it. I don't know if, maybe I'm either looking at the more proper definition, or I'm redefining it within myself, as what I think it is.

Josh continued by focusing on the long term benefits of integrating diversity within the classroom, declaring its usefulness in combating racial tension in other environments as well. That occurrence caused him to focus on another major role of instruction which is to prepare students for life in the real world.

Josh concluded that as a result of this field experience, he became more conscious of the students as individuals. In summing up the benefits of this field experience, he made the following comments:

> I got to see the overall situations the students went through. I got both the science classroom experience, and the student life experience. Looking at what I went through in high school, going through the motion. Now, looking back and saying, wow these kids have to put up with this. They don't even realize they have to put up with it. There are better ways to do what's being done.

The things that the students were putting up with, according to Josh were the rigid schedules that they had to endure. He spoke about the lack of recess periods for the students. He did not believe that they were given enough time for social development. Josh said that the lack of this component contributed to some of the discipline problems occurring at this school. The students posed challenges during this experience which caused him to be concerned about his ability to manage their behaviors. Josh placed more emphasis on the students' feelings and concerns which added a human component to his ideas.

A strong concentration on scientific content was still important to Josh; however, he began to show signs of considering the students to be more than mere programmable objects. They had feelings and needs aside from the subject matter. As Josh explained, "It didn't take long to learn that I could teach the material in the class. However, classroom management is another issue. "

Towards the end of that experience, classroom management was high on Josh's list of priorities. He believed that if there were anything that would prevent him from doing

his job effectively, it would be his failure to maintain classroom control. Josh was very confident in his ability to teach the subject matter. He wanted to move all hindrances which he perceived as interfering with him accomplishing his goals.

Regarding classroom management, Josh described a disastrous day that he was totally unprepared for. It was very perplexing; although, things improved by the end of the school day. He elaborated:

> Classroom management! I tried to teach the 'class from hell... Big mistake, they ate me alive. . . . Fortunately, the class after this chaos went well. But it was not a fair test, since, for the seventh period, the teacher was in the back of the room. I learned that I can teach in my own style. . . . When I called for answers I usually surveyed the room and asked for varying answers. . . . When I clarified a question, I usually tried to show the students strategies on how to react to the questions. . . . My point is that I believe the teaching part comes natural. Providing the structure and stability in the classroom for the students is not.

From Josh's perspectives the changes occurring at the end of the day probably occurred as a result of the presence of his cooperating teacher. Because most of his perceptions about teaching depended on his ability to demonstrate a knowledge of his subject matter and articulate it well, he questioned his abilities. Josh ended this experience focusing on other aspects of teacher effectiveness which are not found in his chemistry textbooks.

Rigid teaching practices

Demographically, the school where Josh completed his student teaching resembled the school from his aiding experience. Interestingly, he entered this school with the same concerns, familiarity and comfort. He described his experience upon entering this school:

> Throughout the school there were very few minorities. I was shocked when I ran into an Asian girl. The whole basketball team is White. Actually there is one Black on the team but his skin is pale, and at first I missed the fact that he wasn't White. In other words, it's a very homogenous group at this high school.

Josh described his feelings upon seeing the Asian girl as pleasantly surprised. His comment was that it actually made him feel more at ease, for a brief moment.

Excluding ethnic backgrounds, Josh indicated there was much diversity at this school:

There is much diversity at this school. Each student is very different from the next. Most are bright and well behaved. Some of the work they do make me wonder why the college students can't do the same. I am getting a feel for the ability levels of the various classes.

Josh's first priority was to identify diverse levels of abilities among the students. Josh entered this experience with basically the same educational philosophy, drilling scientific facts into his students. That was the most important thing. Last semester's teaching experience was successful in sensitizing him to the needs of students as individuals; however, his determination to create an atmosphere that would support his style of teaching scientific concepts to his students, was as strong as ever.

Josh spoke often about how important it was for students to memorize certain scientific facts, and how the failure to do so would inhibit their learning of certain concepts:

I must make sure the students are mentally attached to the lesson, and are engaged in pondering the information. I have also found that I need to give time for students to work over new material so that they know what questions they have. On another point, the most important part of teaching is motivating the students. I must convince them that they will learn the material and are capable of doing so. I have to be patient and continue to encourage them, even when they self-destruct.

In most of the cases, the students finally gave in and turned themselves around.

Josh's statements were consistent with his philosophy of education which is to teach Chemistry to all of the students. He believed that all of the students would be successful using appropriate teaching strategies.

It was important for students in Josh's class to be able to define and understand the truths within science. He said that inconsistencies should be pointed out to them. Josh wanted to develop the students' problem solving skills. His goal was to develop better thinkers. He explained:

> For me, it's trying to teach the students how to think and how to learn, to set their values, their priorities. That's part of what I'm trying to get, and those are the most important things.

Josh believed that by focusing on developing good thinking, the students would acquire the skills necessary to explain how science works.

Redefining educational philosophy. The dialogues from the students in the portfolio connected with the human component that Josh had begun to embrace. He said that their expressions of reality were meaningful learning experiences for him and explained the impact of their voices in the following statements:

> Seeing the students, I think it was a good way of getting across, not everybody is going to be able to go out and just interview every student and so having provided that on CD, you can get closer to a one on one. And you're almost there, and almost you can hear the student. You can hear the frustrations. You can hear what bothers them, that they care, and that these are the things that burden them.

Josh perceived that certain images prevailing within his mind were inconsistent with the students' discussions of their feelings and experiences.

As Josh discussed his ideas about his role as a classroom teacher, his ideas about diversity began to take on different perspectives.

> My concerns have been classroom management, how to get this point across, how to see if that student understands what I'm talking about, if he can explain it, if they can change the situation, follow the implications of that. But it's never been what else that person does that makes them a whole person, rather than just what they can do in my classroom, what they get out of it. Big emphasis for me was

always, if they could sit in classes, get them to the point where if their premises

change, they can follow through and understand what happens, and I think that

will help them in life.

Josh ended his discussion of the portfolio with the quote "it starts from the heart", a

statement made by the program director in the portfolio. According to Josh, this

statement is foundational. He perceived it as important commenting that everything

which occurs in education, should be built on it:

The one that put it out was "it comes down to heart. I think that, and I think that

I always believed it, but I've never put it in words that way. It's something you

have to believe. So I guess to that extent I would add that to my definition.

Josh decided that an acknowledgment of feelings and emotions was not watering down the

curriculum. Instead, it might be useful for improving students' perceptions of the

instruction.

While reflecting on the school year, Josh spoke of changes in his teaching style.

He said that he felt the need to alter his manifestation of excitement in his presentation to

improve his performance. He was so concerned about expressing excitement to maintain

their attention, that he would speak too fast or assume too much. Consequently, he

would not be able to identify difficulties that some students may be having in the class:

I've noticed that I have calmed down quite a bit. I've become a better teacher.

Unfortunately, I seem to have lost the excitement that I entered with. In other

words, I'm not bouncing off the walls. It seems to have allowed the students to

learn better.

By the end of this field experience, Josh had begun to constructively reconsider his early

premonitions about teacher effectiveness.

While Josh beliefs remained constant about chemistry instruction throughout the

year, he embraced a broader perspective of the role of diversity in the science classroom.

Originally, his opinion of diversity seemed very confrontational in nature. He spoke of it

only in terms of power struggles between individuals of different ethnicities, thus his perception of including diversity within the instruction was perceived as an unequal distribution of power. The diverse experiences encountered during his teacher preparation challenged some of his original beliefs. Science was still considered an important collection of truths that students must work diligently to understand; however, he opened the door of his classroom, to consider diversity as possessing important lessons for students to learn in the process of becoming "whole individuals." As a result, there appeared to be slight variations from the strategic focus on the teacher, text, models, and laboratory procedures, to a focus on the young impressionable individuals seated within the classroom.

<div align="center">Jerry</div>

<u>Combatting stereotypes</u>

Jerry is an African American male who was born in the inner city. He lived in the projects with his grandmother until the age of fifteen. He then moved to stay with his parents in a neighboring city. Jerry said that he always knew that there was something better than the situation he was in. He said that he would go to school and see White people, and would come home and just stare at his environment.

Jerry has always loved science. He was always curious about how certain things worked around him; however, he had to struggle to take certain science courses in high school. He said that he was discouraged from taking them because it was assumed that he would not be successful in them. He said that when he did take science classes, he would be one of a very few African American students in his classes.

Demographically, Jerry's high school consisted of predominantly Caucasian students with relatively few Asians, Hispanics, and African Americans. As an African American male in society, he felt that he was already disadvantaged, and would always have to struggle to be successful. Therefore, when his desire to take science classes in high school was challenged, he was unaffected. Jerry expected challenges:

But now science classes, those are the types of classes I had to fight to get into because they weren't trying to let me get into them. I guess they didn't feel I had an aptitude to do that type of work, but once I got in there, it was cool. But again, I was probably one of only one or two Blacks in those types of classes. And I really didn't even acknowledge the fact. I mean of course you know when you are in that type of situation.

Later, Jerry said that he was more skeptical when things happened too easily for him. He explained however, that after he enrolled in the classes, things went well.

An exploration into the influences of Jerry's life experiences must extend beyond his home, community and school environments. Jerry's beliefs were deeply rooted within historical and societal contexts as well. When he discussed his early experiences, he addressed societal stereotypes, and also historical accounts which he considers to have a bearing on his present and his future:

I guess everybody expected me to be a hustler of some sort. I remember this teacher, this English teacher in high school. He wrote an article in the newspaper saying that the Black folks in our school were the ones who wore all the jewelry and the nice clothes. They all sell drugs and stuff like that. That was funny.

Jerry felt that he was thrown into a category, and was judged accordingly.

According to Jerry, perceptions about his potential for success were buried within stereotypes and generalizations. He was faced with the responsibility of proving to himself, as well as others, his capabilities. He knew that dispelling myths would be difficult; however, he felt prepared to meet the challenge. Jerry explains:

I think they [background experiences] have given me sort of a toughness to be able to endure certain pressures or barriers that may come up within my pursuit of success. A lot of people, if they grow up rosy, can't handle pressure, so they succumb to pressure. I just don't think I will succumb to pressure.

Jerry believed that the challenges in his life strengthened him. He felt that he could fulfill any task because he had overcome many struggles.

Jerry was able to look beyond the obstacles that he faced as a result of his plight as a young black male in society. In his struggle to resist forces of discouragement, he recognized that this task would also be difficult for others:

> It doesn't make me feel any anger towards people who taught me early on because they didn't know. But you know, now that I know more, it bothers me.

Jerry said that his teachers, especially the English teacher, were victims as well. While he did not excuse inappropriate behaviors, he recognized their source. Jerry understood how overwhelmingly powerful the influences of society could be.

According to Jerry, the priorities and policies of the school systems are also a reflection of society. He said that embedded within the priorities are subtle messages of inferiority and incompetence. Jerry said that if students don't see anyone like them doing important things, then they won't feel important; however, his perception was that his teachers taught the curriculum they were told to teach.

As a student in a high school with predominantly Caucasian students, Jerry said that he had good relationships with his peers. He participated in sports, which, according to him, was partially responsible for his acceptance:

> Except for a few people trying to discourage me in what I wanted to do, and what I wanted to take in school, school was okay. Sports, I played sports, and I mean that helped a lot. Sports bring on a certain amount of popularity.

Jerry said that it seemed by playing sports, morale is boosted and value increases, which is why many African American males choose this route to secure their futures. For them, it is their great hope for success. Jerry explained that these goals are glamorously and obscurely presented by the media as obtainable and very logical. Therefore, students migrate towards athletics because it's an acceptable zone for them. Society sanctions this means of accumulating wealth, so they feel uninhibited in acquiring it.

According to Jerry, if students are to recognize their full potential, they must be educated in an environment which promotes tolerance, respect and acceptance. Hence, he believes that the implementation of multicultural education is necessary. However, Jerry emphasizes that the process should focus on acquainting students and teachers with the influences of society, so that they will recognize its influences on their beliefs. Although he considers this process to be an ideal strategy, he also reemphasizes his perception of its limited potential. Jerry said that policies, such as these must also withstand the influences of society, which is what he considers multicultural education to be, a mere policy.

Jerry's association with policies carries many negative connotations. To him, policies are a politician's way of obtaining support from helpless, desperate, African American citizens in overly publicized and researched ghetto communities. Offering hope for despair is their way to drum up support for elections. After they are elected, they continue to reproduce and reinforce crippling agendas which are responsible for the conditions in the first place. As far as he is concerned, he and his peers are helpless against such gross misuse of authority, which seems to be characteristic of society.

Thus, Jerry's perceptions of society is characterized by fear, trickery, and power. To him, society is a giant foe of diverse disguises. Its only means of visibility is in symptomatic form, after it has corrupted its prey. In his discussion concerning where multicultural education fits into the scheme of things, Jerry made the following statements:

> I don't know. In these days of being politically correct, I think you know, it's just a new buzz word, just like African American and things like that. So, I really don't give it [multicultural education] too much thought.

For Jerry, multicultural education was merely a policy waiting to be overshadowed by the next great idea.

Even as an aspiring teacher, Jerry's opinion of multiculturalism did not change, He considered it only within the realms of society which meant he was powerless in his ability to promote its use. In his explanation of buzz word, he made the following statements:

Buzz word, the new word of the day so to speak. . . . But I mean buzz word, a new word that people can jump on and just ride it until they have ridden it out, that's all. Multiculturalism, does it really exist? Do people really want to be multicultural? I don't know. I believe it's important, but will we ever see true multiculturalism. I don't believe that we will achieve that type of status.

All things considered, Jerry explained that he recognized benefits of multicultural education. He explained that it was important for kids to have teachers cognizant of diverse ethnic backgrounds. He believed that the teachers would be more equipped to teach students of diversity.

Jerry expressed that his primary desire as a teacher is to promote acceptance and respect for all students, regardless of their gender, ethnicity or capabilities. He recognized the potential of multicultural education for assisting him in accomplishing his goals:

All students should receive it [multiculturalism] as something positive, but all students are not. Because it goes back to just being able to understand somebody whose not like you. That will give you some insight on how these people, or how people who are not like you are. And if you tend to like shut that out, then you're not looking at it from the peripheral. You're looking at it, just tunnel vision. I think that's what's wrong with people now anyway. They don't look at the whole scope of things. They just look at it their way and that's it. Multicultural education should be something that would open their minds up to other possibilities.

For Jerry, providing instruction to accommodate the needs of diverse students, meant introducing them to diverse perspectives. Thus, students are provided with information

in opposition to stereotypes promoted by society, opening their minds and challenging their perceptions.

Jerry believed that teachers who seek to understand the diversity within their classrooms demonstrate concern for their students:

> And being multicultural as a teacher is important because that will enable you to deal with the diversity of different students within your class. Now that's important, I mean because if you don't understand the multicultural background of someone else, then how can you say you even care to teach that person.

Jerry emphasized that teaching is a profession based upon caring, and caring requires an understanding of the students.

<u>Skepticism and mistrust</u>

Jerry entered the school setting very guarded about his minority status. He entered with very few expectations. Demographically, this school resembled his high school and college populations. His primary objective upon entering was solely to complete the requirements for his curriculum. He was warmly greeted and accepted by his cooperating teacher and the students. Jerry stated:

> The teacher was nice. She welcomed me with I guess opened arms. We got along good. I mean the kids and I got along. That was good. Sometimes they got me in trouble. We would be laughing in class, you know you tend to forget you're there to do a certain job.

Jerry described a very pleasant working relationship. He indicated that he believed that he could identify with the middle school aged youths in these classes. He believed that they could relate to him. He said that he treated them as people. Interestingly, this positive working relationship with the teacher and the students was still not worthy of his trust. He was very watchful of them.

Although he performed well in the classroom, he remained connected with the lessons he had learned from society. He described his feelings in the following statements:

> I mean you could tell that these kids were from like redneck type backgrounds. Their parents probably hated Blacks or whoever else. But they didn't even treat me any differently. Kids are kids. . . . I guess because it's not a lot of diversity, so it's not a problem. So if there was more diversity, then maybe it would be more tension. It's just like the old adage in the neighborhood. If a White neighborhood exceeds seven percent minority, White people tend to move out. . . . So, it didn't exceed that certain percentage before a boiling point or something could occur.

Jerry did not presume that his acceptance within the school setting included his culture. As far as he was concerned, their cordiality was little more than mere gestures of common courtesy.

Jerry's distrust was further nourished after being approached to help settle an incident which occurred at the school. Apparently, two African American girls were involved in an altercation with other students, and Jerry was asked to assist in calming them. He discussed his viewpoints of this issue in the following statements:

> It was this old lady, the lady came up to me and asked me, well you see these two particular students always when something goes wrong always have to blame it on the White and Black thing. So, I want you to just talk to them.

Jerry searched beneath the surface of the lady's comments to explain what he was really being asked to do. Rather than perceiving it to be a settling of disputes, he viewed it as concealing the underlying racial issues.

Jerry resented being summoned for this cause. He was very new at the school, and would only be there for a limited time. He did not feel that his ethnicity alone qualified him to address problems that he had no prior knowledge of, simply because the

two young ladies were from the same ethnic background. He did not get involved, and expressed much distaste for having been asked:

> She was talking to the wrong person if she thought I was going to cool the flame so to speak. I'm serious. I would have given my input to those young kids the way I know how to give it to them. I wouldn't have sugar coated it for them. That's me. I wouldn't have been like Farakhan or nothing, preaching to them, of course. I wouldn't have done that. But I would have given it to them in a way that they understood what I was saying.

Jerry felt that his mode of intervention was predetermined by the individual requesting his assistance. Gathering from her communication, he was not supposed to facilitate communication between the students and their peers or teachers. He was supposed to assist by curving their inappropriate behaviors,   "I was a minority person in a minority situation. Good Lord! That's horrible, double whammy!"

From this experience, Jerry recognized the importance of his goals as an aspiring teacher. His focus to promote environments of acceptance, respect and tolerance was stronger than ever. Jerry looked into the future of his students, and recognized that some of them may not use chemistry; however, all of them are citizens; therefore he believed that the instructional environment should be veered towards developing responsible and productive citizens:

> What would I do? I would give more. I would let them I guess read more, or experience more, about these other people, other people's culture, other people period. I mean, you know, it's like if you don't know anyone, you're not going to be friends with them or whatever. You know you got to know something about someone before you're even able to open up to that person or that group of people. And as long as the system is set up the way it is, I don't think that's going to happen.

Clearly, Jerry believed that diversity should be addressed in the classroom. From his perspective, a classroom that celebrates diversity is beneficial for all students. Jerry discussed ideas concerning how he would approach diversity in his classroom; however he felt inhibited in his ability to accomplish it.

Jerry possessed a bureaucratic outlook of his ability to incorporate diversity, even within his classroom. The hopelessness and unfairness that he associates with bureaucracy is immediately transferred to his instruction. Jerry perceived all processes occurring in schools to be reliant on public policy. He explains:

> I can't define it [multiculturalism] because it's just a buzz word like I said before. It's just a buzz word. It's just like a new word for the times, African American, Black, colored, nigger, it's all the same. It's just a new word that someone invented so that they can get more funding for multicultural activities. I mean they really don't mean that, especially in a situation like here. You can't possibly achieve multiculturalism because it is not as diverse as other major cities. I don't believe in the term.

According to Jerry, most of the politicians who promoted an agenda supporting the enactment of policies to benefit "minorities," were looking out for themselves. Minorities, in most cases, are used as scapegoats. Jerry commented that he has not witnessed any occurrences within his community where it has profited from the visits of politicians after elections.

As an aspiring teacher, Jerry spoke often of his love for Chemistry, and the desire that he had to share it with his students. However, his philosophy of teaching transcended the transmission of scientific concepts, to include developing the students as human beings. From his perspective, his cooperating teacher was too rigid with the students. He said that she seemed to ignore their normalcy during instruction. He didn't think that she took out time to appreciate their humor or their interests. Jerry explains the teacher's role:

I think the teacher's role is definitely to teach a course, but I think the main role is to shape the individuals they touch. Because even though the classrooms, or the amount of students you see per day is large, you still are able to touch a certain amount. Because outside of a family, I've said this before, outside of being at home, you're at school eight hours a day. So you should be able to exert some type of influence on the people you teach, whether it's the way you speak or whatever.

Developing responsible citizens is the most important role for teachers from Jerry's point of view. He said that teachers should foster environments encouraging responsibility, decision making, and problem solving. Jerry also believed that teachers should model responsible behaviors so that students would have positive frames of references.

According to Jerry, teachers and students will be able to communicate successfully in environments with positive classroom relationships. He believed that it is the teachers' responsibility to connect with students lives to understand them:

Well I mean you have to ask yourself what's going on in that student's life outside of these walls, why, he doesn't or she doesn't even try? And then you choose to get involved and that's on the individual teacher, but I guess you try to get to them some kind of way.

Jerry's perceptions of teaching resonate his life's experiences. They are based upon his understanding of the feelings and needs of the students. His philosophy of effective teaching implicates nurturing and caring, and preventing and rescuing. He believes that if those factors are in place, the students will have a greater possibility of recognizing their potential and being successful.

Role model

Jerry's familiarity with the students made him feel comfortable when entering the school for his student teaching assignment. He believed that this assignment in this school was based on his race. The student body at this school was predominately

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African American; which according to him, made it the obvious choice for his placement. He explained:

> So, I mean I expect it. It's like putting me at Carter High School. You know, I mean it's some things you got to accept. . . . Carter's a Black school, probably ninety percent if I'm not mistaken, Black. I just felt that because of my ethnicity, or my race that they put me there. . . . However, I'd rather be at Carter than to be at other schools. I'd rather be around familiar surroundings, to tell you the truth.

Although he felt that his placement was transparent, this was his school of choice. He was comfortable in this environment with these students.

As far as the makeup of the faculty was concerned, Jerry felt voiceless. He predetermined that his actions in this school would be judged according to certain standards set by the authority figures. Jerry felt that he needed to concentrate all of his energy towards the students. He felt that if he was going to depart this setting feeling a sense of accomplishment, it would be as a result of the connections that he made with the students:

> I mean, even when I walked into Carter you know, most of the teachers are White. The student body is majority Black so that was cool. I mean that made me feel, outside of the teachers that made me feel like I belonged. But as far as the looks they gave me, I just felt like I was a novelty or an anomaly or something you know. A Black male, science, chemistry, you know those were the looks I got.

Jerry resented being considered an anomaly because it implied to the students that he was an isolated case. The students would then began to consider his reason for success a result of luck or fortune.

Jerry thought of himself as a role model at this school. He explained that the reactions that he received when entering this school were those of shock and awe. The faculty members seemed surprised to have a student teacher from his ethnicity teaching

Chemistry. The students seemed to be in awe about having an African American Chemistry teacher as well. Jerry described his first day:

> Then I introduced myself, and a surprised look came over her face like, oh my God. I remember her introducing me that day to one of her classes, and one of the students was like, aw man, we've got a Black teacher coming in here. I sort of chuckled to myself. And then, my second or third observations, she expressed to me how glad she was to see me because she felt that I would be able to relate to the majority of Black students in her classes, since I'm Black, or African American, or whatever you want to call me. She was surprised, and I believe she used the word shocked. Shocked implied to me that she was shocked that a Black man could survive Chemistry in college. So, I didn't take it wrong. I knew she, I guess she meant well. So I just brushed it off.

Jerry's reception at this school was met with mixed emotions. Although he didn't like being made to feel like a commodity, he was happy to be accepted. He was glad to be placed in an environment where he could make a difference in the lives of the youths. He often spoke about not forgetting his origins. He wanted to always stay connected with his roots, so that he could inspire others to overcome.

Jerry reemphasized that he knew from the onset, that his most significant responsibility at this school was to be a role model. He entered this school with a host of experiences. These experiences taught him to look deep within the souls of the students, to identify needs which could not be addressed by merely teaching chemistry facts. He wanted to inspire them, not just to be chemists, but to be successful in life:

> My role is not to try to make them love Chemistry. Hopefully, my role will be allowing them to see that they could follow in my foot steps, that they could understand and do this as well as I have. I want them to see that they're not just stupid or whatever. Cause a lot of the teachers, I've heard them, they're saying these kids aren't college material. They'll never go to school. And if they do,

they'll go to one of those bad, you know quote unquote colleges that are not

considered reputable or whatever.

Jerry explained that his perception of his position as a role model did not consist of

molding the students to become who he was. He wanted to honor their individuality, and

inspire them to set individual goals for themselves based on their interests.

Regarding the remarks made by the teachers concerning the futures of the

students, Jerry was devastated. He gasped at the impact that these statements had on

him in past experiences, and grieved for the students being discussed:

You can't come to your colleagues and express something like that. I mean that's

something you keep to yourself. . . . That's just branding them for the next year

when they go to eleventh or twelfth, or for the next teacher that's going to hear

this mess. I think it's horrible. I mean I think it's horrible because those same

people are like the people that said this junk about me.

Jerry was frustrated because he felt that the teachers' opinion of the students reflected in

the implementation of their responsibilities. Consequently, he was more determined to

fulfill his role of motivating the students during his time at the school. He wanted to

prevent the students from being destroyed by the negative messages.

Influence of society. Jerry said that he could relate to the comments made by one

of the male students in the multimedia presentation. One of the African American male

students described his experiences within the classroom as "guarding himself." Jerry said

that he identified with these statements and described his feelings in the following

statements:

It meant, what it meant to me was that in this society, it's just, Black males are

targeted for whatever reasons. When you wake up everyday you always have to

like sort of put a shield to protect yourself against adversity or whatever. Like

me, every time I see a police, or get stopped, I'm scared as a you-know-what. . . . I

mean it's just the whole history in the United States, how the Black male has been

singled out for harsh treatment. And we feel that we have to like protect

ourselves or be less extroverted or whatever to protect ourselves from that type of

treatment.

Jerry's discussion of events provided an explanation for the distrust that he has in the

"system". He discussed highly publicized cases involving notable African American men

within recent years. He described these situations as "modern day lynchings". He

believed that certain individuals were being singled out and scrutinized in an attempt to

discredit them. This discreditation in part, according to Jerry, is embedded with messages

purposed for the "whole."

After listening to the students within the portfolio, Jerry implied that, as far as he

was concerned, the students who were discussing their perspectives were in a sense

wasting their time. In his opinion, society is not concerned about how they feel, so they

might as well remain silent.   The thought that their voice might assist in the enacting of

legislation or changes within the school was not entertained. To him, multicultural

education is still a "buzz word" and completely out of the teacher's control.

Again, Jerry's perceptions were derived from his societal and historical influences.

The hopelessness that he learned served as a pillow for the disappointments that he

would encounter throughout his life. Although he sees multicultural education as a

process useful for creating healthy relationships in schools, he perceives it as a policy

that the voices of power would never allow to be successful. He explained:

I think as far as on a larger scale, as far as the way politicians and government

speaks of it, I think they're just lying, like they lie about a lot of other stuff. On

that level it's a joke. . . . I just don't see it. You know it's just like in

neighborhoods, so as a certain percentage of Blacks or other minorities move in,

they run away. It's just like that with schools, you know. The ones with money

are not gonna bring their education down or whatever. ...Because they don't really

mean what they say. I mean that's just the bottom line for me. It's just like the

Tuskegee experiment. I mean the government just lied, lied through the years. I

just don't believe nothing that politicians or people in power or positions say. I

don't believe they want to do anything. They just want to maintain status quo.

According to Jerry, the messages of multicultural education do not concur with the beliefs

of many individuals. He said to foster a curriculum which expresses equity and normalcy

among all people, regardless of their culture, require personal admissions that many

people are not willing to embrace. He said that the unequal distribution of power is

enjoyed and in a sense, revered by those who have it. Jerry feels that in this society,

people seem to like having someone under them to trample on.

While Jerry identified with the students in the portfolio, he reemphasized that

multicultural education has a purpose only if people are serious about it. He

acknowledged that in the long run, it would be beneficial to all students, regardless of their

ethnicity. As far as he's concerned, the lack of exposure to different perspectives, limits

everyone's ability to function in a diverse environment. He explained:

I could relate to White kids because I've been here at Collin University for a while.

Other than that, I'd probably be like the rest of my friends at home. You know

what I'm saying? If I never came to college and had the Collin experience, then I

would have that mentality like the rest of them, saying things like "I can't succeed,

or @#*! all White people". You know what I'm saying, that type of attitude.

Jerry believed that, unlike his peers from his community, his experiences with diverse

cultures prepared him for his role as an educator. He felt that he received skills that

would enable him to function in any school setting.

From Jerry's perspectives, understanding the role that diversity should play in the

classroom seemed obvious. Preparation for survival in a multicultural society should

occur while the students are being educated. Jerry strongly advocates this; however,

throughout the semester, he questioned its acceptance in society and also in the schools.

Jerry believes that there is much contentment with the status quo in this society, and until those comfort zones are disturbed, there will always be problems.

<center>Kyle</center>

<u>Tracking system</u>

Kyle is a Caucasian male from a very small rural coal mining community. He was raised in a two parent home in a lower income community. He considered himself privileged. He described his home environment as a "nice little neighborhood, where not that much trouble ever went on." His high school was very small consisting of about 500 students overall, and was poorly funded.

In high school, Kyle was always interested in studying the earth. He was approved for certain science courses, but discouraged from taking courses perceived difficult, like physics. Kyle said that "normal" students were discouraged, and only top honors students were the ones to which the courses were mentioned. He said that he was treated unfairly because he was not even given the chance to fail it. He was disheartened by that and commented that under different circumstances, his difficulty in college physics could possibly have been avoided.

Throughout his education, Kyle stated that many of the opinions about him were predetermined. He said that the community that he was raised in, and the manner at which he spoke, caused people to automatically form opinions about him. Kyle considered himself a victim of circumstances. He explained:

> I can't help but wonder how many people get that impression when they hear me speak because I have a different accent, kind of slang in the words I use. But yeah, a person can't help the way they talk. I can't just change it overnight. . . . After people get to know me, I think they don't label me like they would if they just heard me speak maybe one time, the first impression.

Kyle understood the impact that labels have on an individual's life. He resisted labels perceiving them as interfering with his expectations of himself, as well as others' opinions

of him. He discussed the attributes of his culture as inhibiting his quality of life. He questioned how much he would have to change to be accepted as "normal".

Kyle compared his high school to that of his colleagues, concluding that it was very poor. It was a predominately White school in a small coal mining community. He characterized the course offerings as "weak" in comparison to other schools, concluding that his learning situation was disadvantaged. Kyle described his school in the following statements. He explained:

> Even though it was a predominately White school, some people might automatically get the sense that it was a well off school. The fact of the matter is, it was a southwest region. And as I'm now beginning to learn from my courses, school funding is based on what property taxes have been paid in by the surrounding area. Compared to northern regions, it is very poor. The curriculum, the way it was structured . . . . I seemed very disadvantaged. Some of them had engineering courses in their high schools . . . . They had calculus and college English at the vocational school, but they were very selective in who got to take those courses. I was never offered either one.

Kyle resented having decisions made for him concerning his capabilities; however, it wasn't until after he entered the university setting that he realized how detrimental it was to him.

Besides facing the stress of venturing into areas that were once zoned off to him, Kyle felt that he was academically unprepared. He was very frustrated. He believed that he was wronged by those who were in authority, who should have been motivating him. He explained:

> As a student, I feel now when I look back at it, I feel that it's just wrong to not even give anybody a chance to even fail it. It's just automatically saying you

can't handle this. . . . I mean I feel deprived because maybe I would be a physicist right now. But yes, it's just disheartening to look back and see that's what went on. . . . I'm not sure, but from the standpoint of trying to prepare kids for college, especially a university like this, they're at a big disadvantage. I'm living proof of that. I learned the hard way why it was important.

Kyle felt powerless in making decisions about his future. He said that teachers and administrators who have power should be mindful of how they use it.

At Kyle's high school, the numbers of diverse individuals represented less than five percent of the school's population. His belief was "everyone who wasn't White was just integrated right in with the rest of the school. I mean there was no difference." The curriculum at the school was the same as the curriculum at most schools. There was never an attempt to embrace diverse cultures.

According to Kyle, in schools with more diversity, there is a potential for more problems. The school that he attended had few students that would be considered culturally diverse. All of the students integrated very nicely; therefore, there wasn't really a need to incorporate multiculturalism within the curriculum. He explained:

It doesn't really stand out in my mind that they were knocking themselves out to be equal or something like that. I would have to say probably they practiced what they were conditioned to practice. But there was no favoritism or anything. I can't recall that. It seemed pretty well laid out and established. There was never any controversy.

Kyle continued by saying there was no need for any disturbances of a racial nature at his school. Ethnically, the students were not disadvantaged because they were not singled out and treated differently.

Although Kyle's high school was not very diverse ethnically, he believed that his personal experiences with discrimination sensitized him to the role of diversity within the classroom. His feelings of isolation and displacement caused him to value similar

emotions faced by certain individuals from different cultures. Kyle's experiences in high school led to an interpretation of what he believed other individuals who are labeled "minority" have to endure. He explained:

> It's kind of a touchy thing I guess. If I went to school and grew up and all I saw all the time were Asian role models or Latin role models, then yeah, I would feel left out. . . . And maybe I would probably get to the point where I felt like maybe they were trying to condition me to think like they did or something. Individuality is something we embrace here in America anyway. . . . And as far as students and children, they need to see that they are important too, or they'll get to the point where they feel inferior because nobody ever relates to them. I can understand that, and I think that's important.

Kyle recognized that feelings of isolation and low self esteem could develop as a result of failing to address diversity within the curriculum. He sympathized with these feelings commenting that no one should be treated in that way.

Kyle discussed his home environment, expressing the conditions that he believes required a focus on diversity issues. He explained:

> I think instead of stereotyping and labeling certain students because of their ethnic backgrounds, or their color or race or what not, you need to go beyond what you perceive, or what you've been cultured into. I know coming from a coal mining community with what a lot of people call "hillbillies" they are, truthfully, a lot of them are bigots. And because they've been enclosed into their own little world, predominantly white, they've never been exposed to other ethnic beliefs or origins. But I honestly think if there are problems like in big schools, you've got to go beneath the surface.

Kyle considered the biases existing within his home environment to be detrimental to the well-being of the citizens; however, there were no blatant controversies. Consequently, there was no need to confront them with multicultural perspectives.

The university was a setting at which Kyle believed that diversity would have to be addressed. He entered the university feeling encumbered. It was much different from his high school. He discussed the differences in terms of the numbers of diverse individuals represented on campus. This acquaintance with diversity did not only include people from other states and foreign countries, but individuals from the northern portion of his home state as well. Kyle explained:

> For me, coming here was a big impact. When I came here, it was no longer just like a white setting, there were just all kinds of different people, even from all over the world. . . . It was like an explosion first coming up here, trying to adjust. Because I feel myself in a separate group. Most of the people to me seem to be from the northern part of the state or a northern state. . . . It kind of makes me wonder what's going on. Are they [university admission personnel] kind of biased against southwesterners? Do they think we're stupid? I joke around all the time that I'm a hillbilly. I'm a hick, but I guess a lot of people actually have that label on me. That's how I feel that I relate to it being from a poor part of the state. And being a minority so to speak.

Along with problems adjusting to the new environment, Kyle's self esteem was affected. In comparison to other individuals, even from a different region in his state, he felt inferior.

At the university, Kyle was provided with opportunities to interact with a wide range of diverse individuals. These experiences challenged many of his preexisting ideas. He discussed one situation in particular which had a great impact on him:

> It's kind of mind blowing when you first come up here. When I first came into Geology one of the people that influenced me was from Saudi Arabia. You know I just had this idea in my head what they kind of believed and how they were. But the fact of the matter is, if he wouldn't have told me, his English was so well, I probably wouldn't have known. He just fit right in. And yeah, I've made friends

with a lot of them. You kind of learn they're human, and you don't need to subject

those kind of people to your attitude. This is how it should be. It's not right.

They have a lot of good experiences to share. I've learned that from a lot of them.

Interacting with students from different ethnic backgrounds, especially

internationally, was quite different for Kyle. The person of whom he was speaking was

from Saudi Arabia, and was a teaching assistant who was helping him with some difficult

problems. He said that the tutorial sessions provided him with information which

dispelled previous thoughts that he had impressed upon him about people from that

ethnicity.

Biases and labels

Kyle identified diversity at the school for this early field experience in terms of

performance levels. There were few ethnically different students other than Caucasian

enrolled at this school. He explained:

Catesville wasn't very diverse. It seemed to be I guess your basic middle class

white atmosphere there. But it seem to go pretty smoothly. I didn't really notice

anything I guess biased, or anything that disturbed me that much.

The lack of overt controversies at this school exonerated the need for attending to ethnic

diversity. From Kyle's observations there was no need to interrupt the normal flow of

things.

At this school, Kyle said there was no need to be concerned about addressing

ethnic diversity because the number of ethnically diverse students were too small to have

an impact. He explained:

Like I said, the majority was just predominantly white. And I guess the very few,

if they felt their culture wasn't being integrated into the system, so to speak, there

weren't enough of them population wise to have any effect.

Kyle perceived the small numbers of ethnically diverse students to limit the need for addressing ethnic diversity, allowing the space for attention to be focused on more urgent matters.

Kyle identified other concerns that he assumed to be possible biases against certain students. He discussed an issue of concern that caused him to wonder whether or not the students were being unfairly treated by the cooperating teacher. He explained:

> And I don't know if she had any bias towards certain students because there was one statement she made that kind of bothered me. I kind of got closer to one of the students who was kind of considered a trouble maker. He was just not motivated very well in my opinion. He just needed motivation within and external, which I was trying to give him. He was absent one day and I was talking with her about it. I told her that he stopped by where I worked, and that he seemed like a good kid. I mentioned that he worked at a fast food restaurant. And she was kind of shocked that he was responsible enough to work. I just felt that was uncalled for, maybe a little bias there.

Kyle believed that the cooperating teacher was viewing the students through lenses that were clouded with stereotypes. He felt that the students were disadvantaged.

There was another student in this class which Kyle considered to be in need of motivation. He targeted these students throughout his experience, readily assisting them with their work. He explained that his reason for targeting these students was because they were "two potholes in the road" who needed to be motivated concerning the importance of education.

Kyle believed that if he were to be successful, he would have to try to connect with the students' interests. He believed that shared interests would allow him to relate to the students, making it easier for him to motivate them. He explained:

> I could get their attention by talking to them before class, when they're coming in. We would talk about hunting or something like that because I always turkey

hunted. A lot of these guys deer hunted which I never cared for but could relate

to. . . . This region is big on high school football. Actually my high school just

won the state again. I could relate to those guys. . . . You can draw them in and

get them motivated if you can relate to them.

Kyle believe that by developing relationships with the students, he could locate an avenue

for possible intervention. Without developing relationships, Kyle believed that his ability

to assist them would be virtually impossible.

Of the four classes that Kyle assisted, approximately three students were

ethnically different; therefore, he believed that culture and diversity was not an issue.

Kyle said that these students were not having the difficulty that the two male students,

identified earlier, were having. According to him, everyone was just "integrated into the

system". He explained:

I didn't notice different cultures brought out in the classes, but then again, I have

to wonder how much can you bring out in a science class. Because pretty much of

what's being taught is just scientific facts and they do labs. If there's anyway I

guess to bring culture into the class, I don't know if it would be best to try to do

that in a science classroom.

In earth science, Kyle did not see any opportunity for addressing diversity. He

considered the process of teaching science to be relating scientific facts to students.

Incorporating diversity was an addendum to the curriculum which could divert attention

from instruction. His primary goal as an earth science teacher was to present ideas in a

way that the students could share his enthusiasm about the wonders of the earth. More

importantly, he wanted to ensure that all of his students experienced the joy in learning

about the earth.

When discussing the experiences that shaped his ideas about teaching, he reverted

to his experiences in high school. He described his feelings of being labeled as one of the

lower track students. He discussed the administrators' discouragement from taking college

bound courses, and encouragement to follow a vocational track, Kyle said that he was determined to prevent that from happening to any other students. In his opinion, students will assume the paths that they are motivated to follow. Fortunately, he was not destroyed by his experiences; however, he fears that he may have been.

As Kyle further explained, the effect of his misfortunes in high school carried over into college. Consequently, as an undergraduate in physics, he experienced much difficulty. In an attempt to overcome this difficulty, he decided to talk to the class instructor about his problem. The words he received from the instructor, reinforced statements that he had grown accustomed to such as "maybe you're not cut out for this type of work." After many days and nights of uncertainty, Kyle decided to change his concentration from physics, to pursue a career in another field that he was greatly interested in, Geology.

As a Geology major, Kyle's situation changed, in spite of the fact that one of the required courses in his program of study was geophysics. Kyle enrolled in this class somewhat haunted by the experiences of the earlier course. He remained calm because his initial observations of this class's instructor suggested a different learning atmosphere. Immediately, Kyle was able to distinguish this instructor's teaching style from the other, by depicting him as encouraging and motivating. He said that he was correct in his early assumption. He reported a successful and rewarding experience. Kyle credited his success in this class to the teaching style and disposition of the instructor, and considered him to be a role model for his future endeavors. He explained:

> A teacher has to meet the student halfway, or at least see those students that need
> that help. I can understand that with a huge class, you can't always probably pull
> everybody in but for the ones that are doing fine, yeah, I mean keep the record of
> who's doing fine and who's struggling and reach out to those that are struggling,
> and try to help them the best that you can. . . . I feel that's what happened to me.
> I was just given up on. I mean you've heard the term weeding out, basically that's

what I sum it up to. I mean there's not enough room, and since you don't grasp

the subject now, we're just going to eliminate you.

Kyle felt that he fell victim to a system that was more concerned about quotas than they

were the students. He said that students are powerless against hidden agendas such as

these, regardless of their capabilities. Therefore, Kyle described his role as a teacher as

empowering students by providing them with skills, early in life, that will enable them to

withstand difficult circumstances.

Socioeconomic diversity

Kyle was pleased with his placement. He commented that Linden High School

was a nice place which reminded him of his own alma mater.   He felt very comfortable

there, and in contrast to Catesville, he felt that the students were more respectful. He

mentioned; however, that Linden High was more disadvantaged than Catesville.

According to Kyle, Catesville had the benefit of more revenue; therefore, their school had

more materials and technology.   In contrast, Linden High School existed in a very rural

area, and had less revenue, resulting in fewer materials and opportunities. Kyle's overall

opinion of Linden High School was that it was a very proud place, and a fine school. He

explained:

I like Linden High very much. I like their attitudes, their commitment to

academics and their pride in their students. They refuse to take a back seat to

another school just because the students are from a very rural environment. I look

forward to doing my student teaching there. I don't think I could have found a

better school to do my student teaching than here. I feel right at home!

Kyle immediately observed that the numbers of students at Linden High School were

similar to Catesville; however, there were fewer ethnically diverse students. He had a

very small number of students from different ethnic origins in his classes.

Kyle identified diversity at Linden High School to exist in the form of

socioeconomics.   In a written summary, he reported the following observations:

Almost all the students are rural, low to middle income Caucasians. I have

however noticed a different sort of diversity. Two of my students have lap-top

computers which they use to take notes and complete assignments. In a sense, I

find it strange that they are allowed to use them when most of the others do not

seem to have that access. I can't find anything wrong with it methodologically,

but I wonder if it has psychological effects on the other students. I am concerned

that they may feel "disadvantaged" in some way.

Of greatest concern to Kyle were students being separated from other students. He

wanted to make sure that all of his students were given equal grounds for advancement.

He continued by pointing out other areas of diversity that he observed at this school. He

mentioned that some of the students had "rough home lives" that were very stressful,

interfering with their performances at school. He was very sympathetic to these

students. He felt that it was important for him to be aware of what was going on in the

students' lives, to make adjustments for these issues within the classroom.

Rethinking diversity in education. Kyle reminisced as he listened to the

perspectives provided by the students in the portfolio. He related his feelings to his

aspirations as a teacher:

Like the female student who talked about being able to go to her professor, talking

to her teacher. What I found most inspiring was, I hope that my students can

always come to me and talk about anything. Especially giving feedback if I'm

doing something wrong. . . . We need a system for somebody, or somewhere we

can be open with our students. To get these different aspects all the time, so that

we know how to try at least to fix the problems to make it a better learning

environment.

Kyle determined that by developing relationships with the students, he could identify

issues before they pose problems. He resolved, that within the classroom, there needs to

be ongoing dialogues between the teachers and the students.

Kyle referred to the students' accounts on the video as "perspectives that he wasn't accustomed to seeing. He considered them very informative and commented that the issues discussed by the students should not be in existence. He believed that they are unnecessary distractions which interfere with the teaching of science:

> Unfortunately, none of this should be in the classroom. But unfortunately, in the real world, race, and gender barriers are there, and we have to deal with it. Because science is knowledge, that's all that should be there. The only thing that we can do is just try to detect what is prohibiting this transfer of knowledge of science, and try to fix it. What else can you do? In a nutshell that's all you can do. Try to repair the damage to do the job at hand, which is science.

According to Kyle, students within science classrooms should be learning science. Deviating from that primary responsibility to incorporate other things demeans the purpose of science teaching and learning.

Kyle's reactions to the voices in the portfolio centered around reducing and resisting stress and friction. He assumed that the students were obviously being educated in classrooms where they were being openly discriminated against. As a result, they were uncomfortable, and their abilities to learn science was being interrupted. In an attempt to incorporate the students' perspectives, unique to his experiences, with his perceptions of the role of diversity, Kyle explained:

> It is just being more considerate of the different cultures, not so much giving everybody a piece of the action, just let's be nice. You know, can't we all get along and make it work.

In classrooms where everyone seems to be getting along, there is maximum opportunity for learning. That is the extent to how Kyle defines a healthy learning environment. His evaluations are determined by surface observations of the classroom. How it appears to be is how it is.

Throughout the year, Kyle identified and attended to circumstances, occurring in the classroom, which resembled treatment that he had once endured. Understandably so, considering the fact that the feelings generated by these situations were those to which he could relate. Kyle's focus was committed to creating equitable learning opportunities void of personal prejudices. He wanted to motivate students to set standards for themselves based on their interests, rather than perceived inadequacies.

<div align="center">Tabitha</div>

Lack of female role models

Tabitha is a Caucasian female who was born and raised in the suburbs of a New England State. She was raised in a two parent home in an upper middle class area. She had very little exposure to people of diverse ethnic backgrounds and explained that her first major affiliations with African American people was seeing somebody's nanny in her neighborhood. In our discussion, she described her environment and schools as "very vanilla," with little or no diverse cultures. She said that she had no understanding of why there were differences.

In high school, Tabitha took upper level science courses. She noticed that during her elementary years, her science experiences were with mostly female teachers; however, as she entered high school she didn't have a single female science teacher. She said that it was known in her high school that if an individual wanted to succeed, the upper level and college prep level courses were the ones to take. Earth science was a class which was considered by some to be a course designated as a credit for graduation. Tabitha would be one of a very few females in her courses. She felt that she wasn't always welcomed, but she said that she was willing to accept the challenge.

The absence of female science teachers had little effect on her; however, she believed that it affected other students. It is her belief that female students from her school were subtly influenced to avoid science courses. She discussed rumors about a male instructor who was not very welcoming to females and had a reputation for being

harder on them. Tabitha enrolled in this class considering it a challenge and performed

very well in it. She believed that it would have made a tremendous difference at her

school if there were female teachers in upper level science course:

> I do think that having a female present at an upper level of science will make a
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> difference. Because if all of a sudden your female role models go away by the time
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> that you are twelve and thirteen years old, you get a very distinct image of what
>
> you can and cannot do. . . . To me, it didn't affect me too much because I was
>
> willing to accept that challenge. But I know that there were no other women who
>
> went into the physics program, and very few that were in the upper level
>
> chemistry. They'd go to biology if they had to. . .

Although Tabitha did not feel that she was discouraged by the absence of female teachers

at her school, she recognized that it might be having an effect on other female students.

She was concerned about the possibility of subtle messages being portrayed to the

students, defining the roles that were expected of them.

Tabitha also mentioned that there were no interventions within the school

addressing these issues. She was unsure whether or not the school was aware of any

problems. Tabitha discussed incidents where role models from the community were

brought in to discuss their careers; however, none of the lawyers, doctors, or scientists

were females. She explained:

> This wasn't part of empowering women in the classroom. It was just trying to
>
> help people decide what kind of career they might want to go in. But it presents a
>
> distinct image of who goes into what kind of career. And all we got was primarily
>
> a male perspective of "men can do this kind of stuff." And when you ask them,
>
> they'll say, well of course women can go in it so what? What's the big problem?
>
> But they don't have the problem of being told on a subtle level, you're just not in
>
> this group. I think that's the same thing with having Blacks or Asians or any other

minorities not included at some level in the group. ...And students base a lot of their perspectives on what they see others doing.

As a result of these experiences, Tabitha was determined that it was important to incorporate gender related materials within the curriculum. She explains that although she chose chemistry as her major for teaching, she might have chosen another career in Chemistry had she seen a female role model employed in another field.

Tabitha described her home environment as "the most boring kind of town you can think of." In school, when speaking of diverse cultures, there were a couple of students from India, one African American, and one Chinese. Diversity in her school was expressed in the form of gender and academic levels

Tabitha considered herself fortunate because in her home environment, stereotypes about groups of people were not validated. She believes that since she wasn't taught to hate, her stance was somewhat neutral. Diversity was not discussed or addressed in any form in Tabitha's household and community; therefore, she believed that an opening was created for her to entertain multicultural ideas. She explained:

> I don't think I got a lot of very strong negative views of groups. We lived in a
> very vanilla area, but there was no overt, these are bad people, good people kinds
> of things. It's learned, and at home it wasn't overly an issue at all. My dad was,
> for the most part when I was growing up, was at the union level. There was
> union and management level. So he was working with a wide variety of people,
> but he was equating himself with them instead of dividing himself from them.

Tabitha expressed that her position as a female also influenced her desire to focus on diversity in science classes. She believed that as a female, she witnessed enough occurrences that sensitized her to the importance of addressing these issues.

The first information that Tabitha received relating to diversity in science instruction, was as an undergraduate. She was enrolled in a course which focused on the

history of science.   Tabitha explained the impact that this class had on her in the following statements:

> In fact, I didn't get a lot of that [diversity in science] until either upper undergrad or the beginning of my grad school experiences. There wasn't really much discussion of where science came from. One of the things I was always interested in, how could somebody come up with some of the revolutionary ideas when there was no cultural basis for them. And that's one of the things I'm getting into in my class now. There was cultural basis for a lot of these things that we just don't talk about, because it doesn't fit in with what we want people to believe about their science. That ours is the best and that we're revolutionaries and the guys before us were total idiots, and that kind of thing.

Tabitha said that she ended this class wanting to know more about the culture of science. She wanted to learn more about science in relationship to how it was recorded, and who made the determinations.

As a result of the undergraduate course, Tabitha began to pay more attention to the ways that women were portrayed in the curriculum. She expressed much resentment towards how the female contributions were being portrayed:

> I know that there's a lot that we've done out there that is totally ignored.   Some of it I think we've lost information because they said oh a woman did it, so it can't be good. Some of it I think the guy stole and published as their own. And until we start reclaiming that, you're going to have a hard time convincing women that they can do science, or that even if they do science, it's going to be worth it for them to do.

Tabitha was resentful that the contributions of females seemed to have been devalued by the historians. She said that the manner at which female contributions are represented in the curriculum could cause female students to feel estranged thus avoiding science altogether.

Tabitha's resentment helped her relate to the feelings and needs of other diverse individuals misrepresented in science curriculum. She resolved that incorporating multicultural ideas in science can prevent people from feeling left out. Tabitha determined that a curriculum solely portraying the contributions of one culture, can be damaging to other cultures. She elaborated:

> Include people of different cultures who are in the classroom so that they feel that they have an equal importance in the classroom. If we always teach White history and we got a bunch of Black students in our classroom, they're going to be very upset. Because it seems they have no history. If we teach them their history was stupid, that's even worse. And I think in a way it holds back science because you don't have as many ways of thinking about things. You have one rigid scientific method of going through things and there's a lot of different ways of approaching problems that get totally loss if you focus on one history, one type of person doing science.

Tabitha believed that teaching narrow perceptions limited the ways people were allowed to think about science, confining science into a problem solving process focusing on one answer.

Consequently, Tabitha resolved that incorporating diverse perspectives in the discussion about science would invite diverse thoughts. She expressed these views in the following comments:

> You don't hold them [scientists] as super masters of everything that discovers things without any background. . . . Where else might they have gotten some of that background? And just direct me to different areas so that I can sit there and say, okay, he must have read something from this culture that influenced why he was able to turn away from a major paradigm of the time. Science is somebody else's doing in a different culture that we might not think is real science. . . . It just

broadens the way I can look at doing science and teaching other people to do science.

By incorporating the contributions of diverse populations, Tabitha believed that she would broaden students' perceptions of science, and the diverse perspectives that contributed to science.

Tabitha continued this discussion by addressing the focus that the scientific method has been given in schools. She believed that this focus limited the way the students' thinking about science:

That I'm not always having to go, oh I have to follow the scientific method. They ingrained that into you so hard. Learn the scientific process here, and we're going to show you a demonstration of the scientific process. I think they get very limited if they can't use their imagination in a sense which is used in other systems of science and actually any kind of knowledge.

Tabitha believed that by incorporating diverse perspectives in science, the door is opened for more students to share in the process.

Tabitha reflected on the other lessons that students learned from the science curriculum used in her high school:

This is a very Western time line, and it is used in most classrooms, even if you don't go over who Copernicus was or Newton was, and all the other things that they did, you're still giving them a notion of what science progression has been. And right now, a whole bunch of White people in Europe, or just around the crescent belt did all the science. And if I say yeah, and there were Black people that did science too, there's no examples. Who are we going to believe are the important people? Right now, it's Copernicus, nobody else.

According to Tabitha, the curriculum sends subtle messages to students about the individuals who are important in science. She said that these messages seem to declare that these individuals are the only ones who are capable of doing science.

Coming from what she described as a "bland" environment, Tabitha had limited exposure to individuals from diverse cultures. However, as an undergraduate, she encountered experiences which sensitized her to the needs of diverse individuals. As a result, she began to focus more closely on her present environment, identifying areas of concern:

> But I can see where like the only Black guy in this class, he sits back from everybody. I want him to come up front because he needs to start doing that and asserting himself in it, but it's very hard. And I'm aware of the situation when there's a minority group in there, of any form, whether the guys are minority, or the women are minorities, Blacks whatever. It doesn't matter. They feel slightly different because I've been in that situation.

As a female in science, Tabitha understood what it felt like to be different from everyone else. She understood why a "minority" person in a group would rather be ignored, due to feelings of discomfort in a particular setting.

Relationships with students

Tabitha entered this portion of her field experience very confident. She was anxious to get started. She wanted to get as much experience as possible from this experience. The school environment where Tabitha was placed was quite different from her background experiences. She described the setting:

> It's a primarily White school, pretty much fifty-fifty boys and girls. But in all of the four classes I was in, there were two Black kids and that was it. There were a couple of Hispanics, a limited group. It's primarily poor. I was talking with some of the students and actually just listening to them. They live in trailer parks, things like that. So, it's not like coming to the city where everybody has the huge house or anything like that. Just like looking in the parking lot, nobody had what I call a daddy mobile, the students that end up with the camaro for their sixteenth birthday. Nobody had that kind of thing.

Tabitha's initial observations led her to believe that many of these students were from a low socioeconomic background. The students at this school did not have many of the amenities that she and students from her high school were fortunate to have.

Tabitha described her experiences at this school as "pretty neat." The culture was quite different from her own. She found that an introduction to this culture aided her in developing relationships with the students:

> It was very different from New England culture. You do have a big north-south split. Nobody wants to admit it unless they just want to tear down the north. But there is a difference in the way people think, and what they think, how they think society developed. Of course, we had big cities. This place was very rural. People did things on their own. They had the house where they raised all the kids. I think they said they had like thirteen kids in this one room house. And you just don't see that up there. So, it just opens up your eyes to things that are a little bit different.   And it doesn't make either one of them less valuable. It's just different.

Tabitha recognized that the differences that she observed translated into more than just a matter of socioeconomics. She noticed that these students had different perspectives on life, and the things that were important.

Within the curricula in this classroom, Tabitha observed that there was a cultural theme flowing throughout. Her speculation was that this was very successful for the students. It boosted their morale, and increased their interests in what they were studying. According to Tabitha, the students were able to see connections within their own lives:

> The students were very interested. They did personal histories. You know you trace your own family back and see what was your great grandfather doing in this community. I thought it was neat that you could sit there and take all these things that you saw your great grandmother doing, and you can say this is why they did

it. And bring it into reality, instead of, look at those fools making soap this way.

They sat there and showed why they made it that way and what was good about

that kind of soap. So, it actually makes science more realistic. It's not just words

in a book or anything. It's something real that they [the students] can do.

Tabitha commended the teacher for providing these opportunities for her students.

She was inspired to do the same for her students; however, she was also motivated

to take it one step further.

Tabitha supported the integration of culture with the curriculum; however, she

thought that it would be beneficial to the students if other adaptations were included. In

the following statements, she discusses the modifications that she believed would

enhance this curricula:

They did one part of it. They did the local aspect of it. But I think they only

went halfway. They only said, look how great we are, and they didn't say, look at

these other people. They have totally different ways of doing the same kinds of

things. They made soap too, but they used this kind of thing. And it was just as

right and just as useful as our way of doing it because their situation is different.

They didn't go into that, and I don't think that they were particularly thinking that

along those lines, they could have expanded the world, instead of just keeping it

locally.

Tabitha was emphasizing another benefit for including diversity and culture within the

curriculum, which is respecting and understanding differences. She said that a curricula of

this design should not only serve to improve students perceptions of themselves, but also

their opinions of others.

Tabitha concluded that this field experience made her aware of the need for

teachers to develop relationships with the students. Considering the fact that she was

contemplating remaining in the area, she felt the need to become more acquainted with the

culture. She said that this experience helped her to realize how important it is to be familiar with the culture of a community:

> I would like to know before I walk in that classroom some very basics about who's going to be there, so that I can be a little prepared. If I went into a population that was heavily Asian or Hispanic or Black, I don't have a strong basis. When I first went in, I knew nothing about this area, other than it was very rural, and that it was not quite like where I now live. But as I went in and talked to the students, the best thing was just listening to them between classes, as they talked to their friends about who was doing what over the weekend, and how other people's lives were going. I learned a lot about the particular problems that the kids were having, and what they liked to do for fun, whatever.

Tabitha found that the relationships that she developed with the students enhanced her ability to work with them. It not only placed her in a position of trust with the students, it also provided her with information pertinent to her understanding about how to accommodate their needs.

Ethnically, most of the students from this school resembled Tabitha. Culturally, they were very different, which Tabitha found rewarding, but also challenging. This experience expanded Tabitha's perception of diversity to include differences occurring as a result of different regions, and different socioeconomic backgrounds. Tabitha resolved that a focus on culture promotes learning by legitimizing and building on the experiences that the students bring into the classroom:

> Because there are basic ways of thinking, not necessarily about the book learned facts. . . . But there's a lot of just street culture that people do bring in, and that is very serious to them. If you just sit there and throw that out, you're not going to make any contact with them. You can teach them the book definition all you want, and as long as they have an alternate definition that also works, but might be totally contradictory to what you're saying, they're never going to listen. You

have to figure out how to bridge the gap and say, well there's two sides to every

coin.

From Tabitha's viewpoint, a curriculum which builds on the experiences that students

bring into the classroom, is involving the student in the learning process. She believed

that the students can then assume responsibility for what is being learned, giving them

ownership and a sense of identity with the curriculum.

Tabitha believed interactive learning environments invite the participation of all

students in the classroom. She believed that they encourage a variety of contributions,

expressed in ways that students could relate to individually, and also in groups. She first

experienced this style of teaching science during her high school years. In reflection, she

said that classes which utilized this approach to teaching were the ones that she enjoyed

and remembered the most:

The science classes that I can remember were the ones where we did stuff, not

where they just put everything on the board. So that influences how much hands-

on I want to put into things. There were classes where the teacher was not so

rigid and serious on everything. There was some fun with it,, and there was also

to a degree personal importance to it. The stuff that I remember were things that

people had an opinion about. Not necessarily that you can have an opinion about

Newton's laws, but an opinion about how these are important in your life and

how they can be influential.

Tabitha believed that these classes were so successful because she was able to relate what

she was learning to her life's experiences. Regarding class size, Tabitha mentioned that

she noticed as her high school moved towards a regional school system, interactive

activities in the classrooms decreased. She resolved that the larger class sizes complicated

matters. Consequently, she prefers smaller class sizes; however, she concluded that

during her practice as a student teacher, she might have to adjust by utilizing interactive

small group activities with the students.

<u>Diversity among ability levels</u>

Tabitha was warmly received at this school. As expected, she entered this setting very confident about her abilities to function. Demographically, this school was more similar to her home environment, with a slightly larger percentage of minority students. In this classroom, the chemistry teacher was a female. Tabitha explained that her greatest challenge at this school was meeting the expectations for teaching advanced placement students. She was placed with an instructor who had mostly college bound honor students. There was much pressure for these students to excel in order to be accepted into reputable colleges. This strong emphasis on college preparation acquainted Tabitha with another issue of diversity, students' performance levels. Much attention was devoted to preparation for college entry exams. It was a very high stressed environment. Tabitha explained:

> Jeanette [the cooperating teacher] did not want me to be involved in the AP [advanced placement] class because there is special training involved, and the students are close to paranoid about their upcoming AP exam. Anything that could have been perceived as endangering their scores on the exam would have caused a near war with the parents. Jeanette did not want me to become involved in such a conflict, ostensibly to protect me from it.

Although Tabitha understood her cooperating teachers concerns, she wanted to be more involved with assisting these students. She was concerned about her lack of involvement with the students. She was concerned about how this exclusion influenced the students' perceptions of her.

Tabitha found that although she was confident in her ability to plan and teach the honors classes, she was experiencing difficulty instilling confidence in the students. Tabitha soon realized that these very serious students did not want to take risks with their future by relying on the skills of a student teacher. She elaborated:

I think that my greatest possibility for a positive impact on the class could have been providing individualized help for some of the students who were having trouble in the class. I did have the opportunity to help a few individuals with some problems, but I sensed some distrust from them. One student refused to allow me to help her with any problem, no matter how simple.

Tabitha realized that her role as a teacher would be inhibited unless she established credibility with the students. She found that the students' stress levels had contributed to creating a high stressed atmosphere, which could also increase her level of anxiety.

Tabitha resolved that her teaching experience with advanced placement students had both positive and negative consequences. From a positive standpoint, she was challenged to provide meaningful instruction for some very exceptional students; therefore, she had to be well prepared, and knowledgeable of the subject matter. Also, she taught only three honors classes; therefore, she did not have the stress of having to make multiple plans. She strictly adhered to a single focus for all of her classes, each day, every week. Tabitha did not totally agree with this decision. She felt that there was enough diversity within the class to make some modifications. She was informed by her cooperating teacher, that since the classes were tested on the same day, on the same material, that they should not get out of phase. She explained:

I worked with three chemistry I honors classes. Most teachers have classes at a variety of levels or types, requiring multiple lesson plans. Even if the classes are learning the same material, it may be taught in a different way. I acknowledge that this made my experience easier than some of the other student teachers. It did not force me to develop the ability to adapt lesson plans in a major fashion to different groups. However, I was aware of differences between the classes and tried to adapt the lessons a little for each. If I had further control over the classes than I did, I would probably have allowed the classes to get a little further out of phase than the cooperating teacher would allow.

Tabitha felt very limited in her abilities to be useful to the students within these classes. She felt that they were classes driven by external pressures which were actually being unfair to them. From her opinion, this environment was not giving consideration or attention to the students' development as human beings.

Tabitha explained that without this experience, she would not have known what it was like to work in high stressed environments with honor students. She perceived this as advantageous because she recognized that she might be required to work in a similar setting during her professional career. Certainly, in her discipline, she would have to teach some advanced placement courses. She explained that this student teaching assignment introduced her to a different culture of individuals who were quite unique in their levels of motivation and commitment to academic excellence. Ethnic diversity in these classes was minimum. The curricula that the teacher used was quite similar to most curricula; however, the means by which the students approached their learning was quite different.

Incidentally, Tabitha's cooperating teacher was very active in gender related issues. She had begun a women's awareness group on the campus and used many techniques to promote equity in her classroom. For example, she used name cards to call on students to ensure that all students were given equal attention. She also used heterogeneous groups, monitoring group activities to make sure that the males were not dominating. Tabitha was very comfortable with these strategies. She readily understood their importance, and did not hesitate to implement them. Gender equity was one of her primary concerns.

Developing understanding. Tabitha said that the multimedia portfolio, shown in the science methods class stressed the importance of relationships between students and their teachers. She said that the students in the portfolio were impressive. Her perceptions of the students' message was that the construction of healthy learning environments greatly depends upon an awareness of issues within their lives.

I think most school situations, you don't get to know your students beyond this, well you came in, I know your name. I know what class you're taking. I know whether you're on the academic track, or the vocational track kind of thing and that's it. And then you don't take into account the rest of their lives.

This emphasis on relationships caused Tabitha to question how many undesirable incidents in schools, could have been avoided if there were more understanding between students and teachers.

As a result of the dialogues from the portfolio, Tabitha was inspired to focus more closely on how the environment could be constructed to promote positive relationships between students and their peers. She was impressed with a young male student's discussion of gender issues, commenting that he not only demonstrated an understanding, but also respect:

I liked how one of the guys was speaking on girls' issues, on gender issues.

Saying, yeah I recognize that there are some problems and giving his perspectives on it.

Tabitha resolved that a learning environment which encourages peer collaboration could cultivate understanding and respect among peers. She recognized that the benefits of such an intervention would extend beyond the classroom.

Tabitha said that the dialogues in this portfolio expanded her thoughts about the role of ethnic diversity in science education. She said that she was motivated to add to her original perspectives of supplementing the curriculum, an emphasis on classroom interactions:

I was more concentrating on how I could bring all cultures in. But it's learning to value every individual for what they are, no matter what culture, no matter what they're bringing into it. Realizing that's a real person and that if they're different, it's still just as valuable as being the same as I am, or similar to me. And I think it's going to be a matter of presenting a variety of different people as being normal,

as being just right to be different. And letting the students see a little bit of who I am, instead of just being the teacher who's up there putting your quarter in the slot and chunking out science information. Letting them know that I actually have a life, and acknowledging that they too have a life, that is not necessarily the class. But we can come together in this one area.

As a prospective teacher, Tabitha was inspired to think more about the personal relationships that she would like to develop with her students. She was convinced that if students are permitted to identify with their teachers' human component some of the barriers, which occasionally interfere with learning in the classroom, will be destroyed.

By the end of the semester, Tabitha observed changes in her beginning ideas about teaching. She said that her initial focus was to ensure quality of instruction. She explained that at the beginning of the year, one of her primary goals as a Chemistry educator was to teach her students everything she could about Chemistry.   She felt that the students needed to be exposed to large quantities of material. As the year progressed, she noticed that her philosophy evolved to focus more on relevancy instead of quantity. She decided that by making the learning applicable to the students' lives, they would be more engaged in learning. She determined that this approach would be more advantageous because it would assist her in accomplishing her primary goal, which is to promote success and achievement for all of her students.

<div align="center">Cedric</div>

<u>Wealth of experiences</u>

Cedric is a Caucasian male whose beginnings were very rural, somewhere behind a corn field. He was raised in a two parent home and later moved to the suburbs. He lived near a military base, which exposed him to a high percentage of individuals from diverse cultures.

Cedric described his high school experiences in science classes as forced. He said that he took them only to satisfy requirements. While reminiscing, he recalls that the

classes that he remembered most were those which encouraged active involvement. He spoke fondly about these classes saying that they allowed him to do his own research and make presentations. He was very uncomplimentary to those classes which didn't. Cedric explains:

> There was so much structure to it. All you had to do was show up, fill up a paper, and you could cheat all you want. You didn't have to really learn anything. I didn't really like that.

According to Cedric, meaningful learning occurs during the application phase, when students are motivated to interact with their subject matter. It is then that teachers can be assured that their students are receiving maximum benefit from their educational experiences.

Aside from teaching styles, Cedric mentioned other attributes that resulted in memorable school experiences for him. He spoke of personable teachers who entertained the students at times when school was not in session, by attending events such as movies or barbecues. Cedric remembered that he performed best in those classes. He said that the teachers convinced him that they cared about him, which is a concept that Cedric spoke passionately about. He said that teachers who don't care, transmit those feelings to the students, as much as teachers who do. Cedric believed that the behaviors of the teachers can influence students' achievement in the classroom.

Being raised near a military community, Cedric had the opportunity to interact with a variety of people from diverse cultures. He would interact with them in his community, at bus stops, and at school. He discussed relationships that he formed during these encounters, emphasizing their benefits in combating racial divides:

> I met these people on the school bus and everything. It was good because I'm sure there was talk about groupings in school, about the freaks, the Blacks, and the jocks, how everybody has assignments to groups. And I was really good friends with three Black women at my bus stop who, I didn't write to them, but we were

talking about writing once we left school. I think we had like a mutual respect. I

didn't try, you know a lot of times White people would try and kiss up to the

Black people, and I didn't try to do that. I just tried to treat them nicely. And

they did the same to me.

Also living within that community, were Asians and other ethnicities as well. Along with

the African Americans, these groups comprised about 30 percent of the population.

Cedric described harmonious relationships with all of his peers. He said that tension

would sometimes arise during periods of time when certain students would be involved in

disruptive behaviors, for example African American. Many times, the disruptive

students in part, would become representative of the whole, which would place the

nondisruptive students in uncomfortable positions.

At high school, Cedric noticed diversity relating to socioeconomics and academics.

In most cases, he observed that these two categories seemed to have been somewhat

related. He explains:

That's the kind of experience I had. A lot of the poorer White people were kept, I

guess it was tracking actually, put in shop classes and gym classes. I asked to do

a welding class, and I was kind of told maybe another science class would be more

appropriate or something else like that. . . . It makes me feel bad because I still

want to do it.

Cedric believed that his identity as a college bound student determined his course. Shop

and related courses were automatically considered by some to be a waste of his time.

They were courses designated for people whose future did not follow the academic track.

Aside from the diversity among his classmates and peers, Cedric mentioned the

presence of two African American teachers. These teachers instructed him during his

middle school years in seventh and eighth grade. Cedric considered the presence of these

teachers to be valuable to the school. He said they contributed more than just academics

to the school:

I only had two African American teachers, and the rest were White. They were in

the seventh and eighth grade. . . . I guess with them, it was just helpful to have a

Black teacher teaching. It made the students know that they had more knowledge

to give to us. They were smart.

According to Cedric, the faces of the African American teachers offered different

perspectives for the students. These faces provided them with associations which many

times conflicted with prior information.

According to Cedric, there were never any attempts to incorporate diversity. He

explains:

I don't know if there was any effort to worry about diversity in my classes

because like biology, it was dissection and stuff like that. We did evolution which

deals with the White European views. Physics is European also, and Chemistry is

European, and Earth Science, if there's anybody mentioned, it's European also.

Regarding the curriculum, Cedric also acknowledged that his science classes were based on

traditional texts and materials.

At the university, Cedric considered himself fortunate to have taken a social

foundations in education class. He said that it was in this class he was made aware of

issues regarding diversity that he was previously unaware of:

I took a social foundations course. She made us aware that there were problems

with women and there were problems with other minorities. I think that's a big

step. As far as I was concerned everything was kosher. Now that I've had this

class and can see that may be there were little things going on like teachers

choosing a male to respond to the question, or allowing a male to be more

aggressive in response to a question instead of asking for hands, and I do that a lot.

At least, I plan on taking a multicultural class.

Cedric believed that a course which focuses on diversity would help him to understand the role that it should play within the classroom. He considers this information to be a vital part of his teacher preparation. He explains:

> I would be worried as a parent of a student that they would not address, or that they would not make my child more sensitive to multicultural issues. I'm a believer that it's a global world. You can't just sit on the porch with your own kind. Even if you're Black, or if you're White, or if you're Asian, you can't just hang out with those people anymore. My child will have to be able to interact with other races and be friendly with them. I don't want to be negative about the teachers, but I think maybe there should be some kind of movement to make a lot of teachers more responsive to these issues.

Cedric considered a focus on diversity to be a vital part of teacher preparation because confronting diversity in the classroom is inevitable. He believed that teachers need to be confronted with experiences that will challenge and expand their thinking prior to entering the classroom.

Making better citizens is the primary role for education, according to Cedric. As far as he is concerned, inspiring students to be scientists, or to pursue science related fields, is minor to the role of preparing citizens for society. Cedric also believed that an emphasis on diversity extended beyond students being informed of scientific related information from other cultures. He perceived it as helping people to develop skills that will be useful for survival in a complex society:

> Yes, people need to be able to exist in harmony with other people. It may not mean that you have to walk hand in hand. You don't have to have interracial marriages. It's just being tolerant of people. If you're ignorant of something, you're most likely not going to like it. We fear what we don't know. And if we can let people know about other cultures, then maybe they'll have more respect for those cultures. To know that the Mexicans are descended from a line of

people with a calendar that was more advanced than what we use today is

incredible. That shouldn't be. You shouldn't pass immigration laws next week in

judgment, saying illegal immigrants are shiftless and will work for nothing, or are

expendable because they are not. They're people.

Treating students as if they are human beings summarizes Cedric's perceptions of a
model teacher.

Cedric emphasized that a good teacher is an individual who takes the time to

understand the students' feelings and extenuating circumstances that sometimes occur

within their lives. He discussed behaviors from teachers at his high school that pleased

him, and behaviors that annoyed him. He credited these early school experiences with

the origination of his ideas about his future role as a teacher. He explained:

I know what I don't want to be like, and so that's steering me. I plan on being

very friendly and doing a lot of things. I'd like to do something to let the students

know that I am a human being and they could approach me with questions.

Maybe that would make them more receptive to what I have to say. I plan on

doing a lot of stressing the environment and being a good role model. . . . I want

the students to feel like I'm their friend, and I'm involved with them.

Cedric was greatly concerned about the atmosphere in his classes. He believed that the
classroom climate played an important role in determining students' comfort levels.

Along with his high school experiences, Cedric also credited classes at the

university with influencing his thoughts about education. More specifically, he credited

them with increasing his awareness of the individuality among students and their needs.

He explains:

One of the biggest things is to make better citizens. That's treating people

decently. Not just giving them an F, but maybe trying to find out why they did

so poorly. . . . You know, I want to believe in the student. I know that there's

going to be some that are not going to believe in themselves and are not going to

give two craps about my class. But that's all right. I'll just try, I guess. It's hard because students can be mean to each other. And I think that's going to be the hardest part, being able to accept that I might not have harmony in my classroom. That people can't just come in and forget everything and feel at home. That's what I'm trying to strive for, the home like atmosphere.

Cedric believed the learning environment should be nurturing for students. That way, they will feel uninhibited about expressing their feelings.

Reactions to racial issues(students)

Cedric's field assignment was in a high school which was predominately Caucasian, with roughly 20 percent of the population consisting of students considered to be minorities. One day when he entered the school, his cooperating teacher informed him about a situation which occurred in an afternoon class after his departure from school on the previous day. It was a very emotional experience for him. On this afternoon, there was a Caucasian male student who openly discussed his membership in the Klan. His discussion discomforted the only African American female student in the class, presenting a problem for the teacher and the need for resolutions. She shared her decision with Cedric. It was Cedric's feelings that this female student was penalized during the resolution. He responded very emotionally:

Mrs. Blaney asked the students at the beginning of class what they were proud of, and what made them feel good. A student said he felt good being in the Klan. There is one African American girl in this class. She does not feel comfortable working with anyone in this class. Mrs. Blaney is going to move her to another period where there are three other African American girls. I feel uncomfortable with this because the bigot gets to stay undisturbed, and is made to feel like it's he and his prejudices that are being upheld. The girl has to rearrange her schedule and try and make new friends. The bigot should be made to have some experiences with the other races. I am getting too emotional and will not write further on this.

The resolution for this problem, according to Cedric, seemed to have resulted in more effort from the female student. He considered this to be unfair considering the fact that she had not done anything wrong.

According to Cedric, this was a missed opportunity for a learning experience. He believed that it could have been addressed in a way that would have been more beneficial to both students:

I don't know if something should have been done to support the African American student to make her feel more at home. . . . I don't know if I would have made the girl feel like she was the one with the problem by moving her. And I would have liked to have had a one on one conversation with the Klan member, and find out just what it was he was getting out of it. And see if there's some other way we could redirect his interests. Because apparently, what he lacked was the involvement and the feeling of membership. That's what a lot of people lack when they join those kinds of groups. They feel like they're somebody now. I would have tried to redirect him to some other path, some other group to make him feel involved, and to let him know how much his feelings were hurting this other child.

Cedric's premise was that the Klan member was ignorant concerning the repercussions of his behavior. He suggested that an educational approach would have served both students by providing useful information and skills that could be used in the future.

Changing the environment at school, in Cedric's opinion, would yield positive outcomes. Although the environment should foster mastery of scientific principles, it should also address students needs for skills that will promote successful experiences in other aspects of their lives. He explains:

I'm hoping it would lead to a more harmonious environment where you're not so quick to judge somebody until it is actually spoken, kind of like applying the scientific method to something. You know you don't judge something until you've

experienced it and been able to analyze it with an open mind or an objective mind, and not being so quick to believe other people's opinions about things. That's a good analogy, to develop critical thinking so that students aren't so quick to accept what they're told about other people and they decide to experience it for themselves before they make a decision.

Cedric perceived the altercation to be an avenue for developing problem solving and decision making skills. He said that with proper structure, the learning environment could provide students with skills applicable to resolving other issues which might be occurring within their lives.

Cedric concluded that the setting at which the altercation occurred was very convenient for him. While he was disturbed by the occurrence, he was removed from the situation because he did not have to make the decision. Instead, he was given an opportunity to react to the decision made by the teacher:

So in a control setting where I got it second hand, and I knew the teacher, I could react to it outside the school and be frustrated. To not have the student in front of me, to see how displeased I was with that student for doing that. I can just turn him off. So hopefully when this happens, and I'm sure it will, I can show the student that I don't quite agree with him. Maybe we can make a little bit better environment for the classroom by working with him a little more, than if I were just to jump off at him. If I had been faced with that experience, I probably would have reacted as strongly as I did when I heard about it.

Cedric resolved that he was unprepared to handle a situation of this caliber. The second handed account afforded him the opportunity to reconsider his own thinking, deciding on a more constructive approach.

Reactions to racial issues(newspaper report)

Cedric's student teaching assignment was at a school quite similar to the one from his early field experience. He was quite comfortable with this assignment. His greatest concern was implementing activities that would actively engage the students:

> My teacher is Mr. Braxton. I have been in his classroom twice now. He likes to use a lot of worksheets, and this makes me feel like I won't be able to use much of what I have learned in this class and my other ones. I hope that the mini-unit [assignment from the methods class] will buy me some freedom from the mundane.

Cedric was concerned that he would not be able to foster the type of learning environment that he preferred. He was afraid that he would not be able to fulfill his responsibility to his students

Cedric considered classes that relied heavily on lectures and worksheets to be boring to the students. He wanted to create a classroom that engaged the students. He believed that these environments would allow the students to enjoy learning. He made the following comments after discussing a unit he designed on caving:

> I think that education is really interesting, that there are a lot of really neat things going on. Like all of the trivia. It's interesting that it can all tie back to a common theme. I think it would be a shame if the students don't learn these kinds of things and have fun learning them.

Allowing students to see connections in what they are learning to their everyday lives is important to Cedric. He believed that these connections provide explanations to students concerning why they are having to learn certain things.

The student population for Cedric's student teaching experience was predominately Caucasian. He indicated that the population of ethnically diverse students in his class were about 6%, consisting of Hispanic, African American and Asian students. He noticed that in his classes, there seemed to have been an equal number of males and females. He discussed his early observations:

I do not have an exact count but from my classes there are an equal number of men to women. The women appear to freely speak their minds without much fear of shame. In the three classes, I sit in, there are two Black students, a couple of Hispanic students and one or two Asian students. The rest of the group is White. I have not seen or heard of any racism, but I am sure it is there, and the article in the local newspaper only convinces me more.

The article to which Cedric was referring was printed in the local newspaper. It was an article which expressed students feelings of discriminatory practices occurring within the schools. He had not witnessed any of the occurrences; however, he honored the students freedom to express themselves.

Cedric explained that he was enlightened by this article, acknowledging that some of the occurrences seemed to have been legitimate concerns. He was perturbed by the teachers' responses to the article as discussed in the following comments:

On Monday, the reaction of the teachers to the article was intensely against it. During lunch I ate with the teachers in the teacher's lunchroom. All the teachers present were White. No one believed that there were any race problems at the school. They felt that the newspaper reporter interviewed the problem children, and they "just don't see any of the things in the article." I felt like screaming because they didn't grasp that they may not have the problem, but the students sure as heck felt like there was one. It was very hard to be quiet, but amazingly I was.

Cedric reacted very strongly to the teachers comments. He said that he lost a lot of respect for the teachers because they spent much time denying and disregarding the statements made in the paper. Cedric believed that the teachers misused the information that was printed in the article. He believed that the information should have been used to ensure the safety of the learning environment, instead of refuting the existence of these problems at their school.

Relationships with students. Uniform thoughts flowed throughout Cedric's responses on the portfolio. His reflections expressed the heart of his feelings about his future role as an educator. Echoing within his responses were expressions denoting nurturing, caring, and understanding as pertinent roles for teachers. He explains:

> The one thing that I really liked was when one of the students said something like the teachers should care about their children. I thought that was interesting. . . . It was interesting because the students were looking up to us as being parents almost. . . . This just reinforces what my plans are. One of the things I want to focus on is treating the children or treating the students as young adults, that are also humans. I want to be able to meet them after school if they have problems. I want to be able to be a parent for them also. This thing reinforces what I need to be doing as a teacher.

Cedric's ideas about his role as a teacher were confirmed. He believed that the students' perceptions of an effective teacher reflected his goals. He was satisfied.

Accessibility and attainability are qualities that continued to surface as Cedric continued his commentary on the portfolio. He believed that teachers who possess these qualities are able to create welcoming and comfortable learning environments which promote student learning. Cedric explained:

> Going back to what was said about making the students feel comfortable, you might as well change the class if your students do not feel like they can relax enough to take in information. And if they do not get anything out of my class, at least they should know that they can talk to me. That's what's most important. I think students these days need more than worrying about plate tectonics or oceanography and chemistry, or anything else. They need to have some confidence in themselves, and they need to have a friend. That's what's going to be most important to me.

Teaching earth science is very important to Cedric. When he speaks of his discipline, he speaks passionately; however, developing good citizens for society is a role that he also considers important. Cedric's believes that a nurturing atmosphere for learning would satisfy most of his objectives. It is his opinion that these environments address academic requirements, as well as other needs that students have.

Cedric's philosophy of education remained consistent throughout his experience. Acknowledgment and respect for students as individuals was the driving force of his goals as an educator. His reactions towards gender, ethnic, or socioeconomic were so strong because they interfered with the core of his beliefs. Cedric strongly emphasized that teachers should not only motivate students to learn science, but they should prepare them to be successful constituents within society.

Chapter IV

Interpretations and Thematic Analysis

The beliefs held by the pre-service teachers are the result of influences from their subcultures. These subcultures are their windows of the world, the places where they receive their values, ideas and customs. Several unavoidable subcultures identified by Furnham (1992) are the family, peers, school, mass media and the physical, social and economic environment. These subcultures possess the capability of touching the lives of every individual, exhibiting their influence in various ways, depending upon the individual.

Evident within these experiences are the boundaries produced by each subculture. The extent of travel beyond the borders depends upon the impact of their experiences. Three themes depicting the influence of the subcultures on the pre-service teachers' beliefs emerged during analysis. Each theme will be discussed, interpreting the influence of subcultures, namely, the family, school, media, and the social environment, on their belief systems. These themes are: (1) Early life experiences shaped the pre-service teachers' sense of identity and influenced their beliefs on diversity, (2) Experiences with diversity influenced pre-service teachers' philosophy of teaching, and (3) Experiences with diversity during the teacher preparation program challenged or confirmed pre-service teachers' preexisting beliefs.

Life Experiences, Identity and Diversity

The perspectives on diversity as provided by the pre-service teachers revert to the discussion of their life experiences. In each of the vignettes, there is clear indication that their early life experiences shaped the pre-service teachers' sense of identity and influenced their beliefs on diversity. This theme will be discussed in relation to each of the five pre-service teachers.

Josh. The influence of Josh's perceptions of diversity began with the work ethic concept provided by his parents. Working up by your own bootstrap, performing any

job that is available, was the philosophy that his parents instilled within him. On one occasion, Josh commented that his parents functioned in capacities that many African American individuals would have classified as discrimination, had they been asked to do the same jobs. Josh resolved that the acts of the past are not a part of the present or the future. He asked if "minorities" were actually disadvantaged, or did they place themselves in those positions because of poor work ethics.

The importance of working hard to receive maximum benefit from your education was highly emphasized in his home. Josh worked diligently in school, experiencing many successes. He developed strong self confidence. He was not afraid to assert himself or express his opinions. He knew who he was, and how he got there. His means of getting there was as a result of determination, his seizing of every opportunity and his lack of fear to embrace challenges. As far as Josh was concerned, individuals who did not have this, or a similar philosophy, was simply unwilling to do what it took for them to succeed. It worked for him, and it would work for anyone who is serious about being successful, and is not trying to avoid hard work. These perceptions were not only influenced by his family and his home environment, but also the media. For example, many times when "disadvantaged" groups are portrayed in the media, whether they are "minorities" or homeless, they are portrayed as hopeless individuals having no purpose and no focus, people who are fleeing opportunities.

Josh's perceptions of diversity were further influenced from within the community, as a result of negative experiences with the African American students at the bus stop. As far as Josh was concerned, these students' perceptions of valuable use of their time was ridiculing him and his siblings at the bus stop everyday. He resolved that the students victimized them because of a desire to have negative attention focused away from them, and on someone else. He felt that their insecurities, and displacement warranted a need for them to find someone else to look down on, then maybe they wouldn't have to feel so inferior.

At school, Josh's perceptions of diversity were further influenced by negative occurrences. Josh was perturbed by the behavior of the minority resource person who he accused of making an issue out of the report in the newspaper. He said she seemed to have been a person who was determined to incite riot. He felt that the students would not have been so angry if she had not stressed inequality in the way that she did. Josh found himself having to constantly defend himself or explain his comments. He said that he became very uncomfortable with African Americans in general, not knowing what comments were safe to make around them. He found himself identifying more with his Caucasian peers, claiming that he seemed to see the world from a White perspective.

As a result of Josh's experiences, he pictured interventions such as multicultural education as a request for handouts, or as some measure of calming an excessively complaining group of people. Even after taking a social foundations course as an undergraduate, he maintained these beliefs. Josh commented that the instructor for this course reminded him of the minority resource person at his high school. In his opinion, this instructor, used the voice and style of a preacher, to rally for the cause. Josh perceived the content of this course as promoting inequality, claiming that the additional emphasis of cultural issues granted extra attention to certain sectors of people, deviant from the important facts to be addressed within the curriculum.

Jerry. The ills of society were primarily responsible for Jerry's perceptions of diversity. In every response, concerning intervention, Jerry would always address society. In his discussions, he spoke of past unjust historical occurrences, such as the Tuskegee experiment to signify and support his distrust in the system.

From Jerry's family and his community, the message was, "prevail in spite of the circumstances." He was to be on his guard, knowing that "the enemy" was always going to try to keep him down. He was to be strong and proud of who he was, and not let anyone make him feel as though he was a nobody. Jerry was very self confident; however, he never felt that his potential, or his contributions would be valued in this

society, thus demeaning his existence. Incidentally, during this school year, Jerry attended the funerals of at least three of his peers. Jerry's perception of reality consisted of police and paramedics arriving too late to make a difference, and harassment by law enforcement agents. He learned to place confidence in no one.

Jerry's struggle for the opportunity to pursue science classes in high school further fueled his distrust.   Jerry discussed his teachers, and how they had also been influenced by stereotypes perpetrated by the media. He defined the media as "their medium for inciting hatred." In his discussion of the teachers and administrator's assumptions about his aptitude, Jerry mentioned that society was the source from which they were derived. He also mentioned that the English teacher, who claimed that all of the African American students were on drugs was influenced by society as well. According to Jerry, the "system" is anti-multicultural. He saw very little benefit in a program which did not stand a chance of being implemented.

In Jerry's high school science classes, he would be one of a very few African American students taking the classes. He resolved from those experiences that many African American students could be uninterested in science courses. In many conversations, when he spoke of his role in the classroom, he somewhat resisted the image of role model which suggested that he was to make Chemists out of the students. He indicated Chemistry is not for everybody, and he wasn't going to try to make people interested in a subject that did not interest them. Jerry said that school systems should not force students to take Chemistry. He did not see the students as possibly being socialized into different directions. He perceived them as being uninterested. Thus Jerry was untouched by the statistics concerning their under representation within science classes.

Regarding diversity, Jerry perceived his impending role as expressing to individuals who were not of his culture, that stereotyping is wrong, and all people have something positive to contribute to society. He wanted to emphasize to the youths from

his culture who were in danger of being discouraged by the "system," that they needed to be strong, and that they, like he, could prevail in spite of the circumstances.

Kyle. Kyle described his family influences as "down home Christian values". He said that his parents taught him right from wrong, and in his community, there were very few disturbances. The police were hardly ever called to settle disputes. Kyle described his home environment as a very small, unified community, which he credits as developing him into a confident individual with a strong sense of identity.

During the earlier years, Kyle had very little exposure to people of diverse cultural backgrounds He explained that the few minorities that existed at his school fit in with everybody else. Kyle said that there were no differences. He said that he befriended them and treated them like he would anybody else. In this environment everybody seemed to have gotten along. There were no complaints, thus no need for intervention. Thus, Kyle perceived the role of addressing ethnic diversity in science instruction as necessary only in the event of disturbance. He acknowledged that the texts presented biased representations of the contributors of science; however, he perceived the inclusion of multicultural ideas as deviating from the teaching of science facts.

As a result of personal struggles with discrimination in high school, Kyle developed a different focus for addressing diversity. These struggles challenged the self confidence that was instilled in him from his home environment. Somehow in high school, Kyle believed that he was categorized as a non college bound student. He referred to himself as a "normal" student, saying that the option of taking more advanced classes was never presented to people like him. Kyle was unsure about the origin of these perceptions; however, he recalls having negative experiences with a Geometry teacher at his high school. Kyle said that he didn't understand it, but this teacher considered him a trouble maker, and blamed him for every disturbance which occurred in that class. Kyle struggled with these negative perceptions trying to prevent them from being reflected in his behavior.

Kyle confronted similar struggles upon entering the university. He pondered about the makeup of the university questioning, whether possible biases were in existence against people from his region. Kyle entered feeling very inferior, wondering how he was being perceived, even by people who came from the northern portion of his state. Although, he was certain that his interests were in science, he felt that he would be challenged in his attempt to pursue it. He was very determined, even after he was unsuccessful in physics. Kyle continued until he discovered the field that he later considered his calling, earth science.

As a result of his personal experiences with discrimination, Kyle developed perceptions of the role of diversity to be focused on identifying biases that translate into negative perceptions of students. As a pre-service teacher, Kyle was on guard against what he called a gross misuse of power. Kyle was concerned about students' developing negative perceptions of their capabilities as a result of these biases, which could ultimately lead to failure.

Tabitha. Tabitha depicted her home environment as a place where she was nourished and prepared to face all obstacles. The influences from her family assured her that she was competent and capable of doing anything that she wanted to do. Tabitha commented that the support that she received from home pillowed her from the discouragement that she might encounter outside the home. Consequently, she was not afraid of challenges. She would assert herself without regards to the opinions of others.

In her earlier years, Tabitha's exposure to ethnic diversity was minimal. She commented that even though she had limited exposure to ethnic diversity, she also had limited exposure to information regarding negative stereotypes. There were no conversations about differences in her home. She commented that her first experience with an African American was seeing somebody's nanny in her neighborhood.

Tabitha's major experience with diversity during her early years, was as a female in advanced placement science classes. She recognized that there were only a few girls

taking the classes. In many cases, she would be the only one. Although she felt unaffected by any gender biases, she was aware of their existence at her school. She knew that she was occupying seats that many, including some of her teachers, considered to be reserved for males.

After taking an undergraduate course focusing on social issues in schools, Tabitha began to understand some of the issues which she observed at her high school. Her opinion of this course differed from Josh, for she gained understanding that she considered useful for her future endeavors. In applying the information discussed in this course, she recognized that the limited amount of girls taking unrequired science courses could have been due to the lack of female role models, or from subtle messages in the hidden curriculum.

Consequently, Tabitha's beliefs about the role of diversity centered around incorporating role models into curricula for examples to challenge contextual information, identifying how certain individuals are being represented or excluded. Tabitha's focus was to combat the negative feelings that could occur as a result of being neglected.

Cedric. Cedric's early life consisted of a wide range of diverse experiences. From his family, he received a wealth of stamina and support. Thus, Cedric developed into a secure young man with a very firm set of principles. When speaking of his diverse experiences, Cedric spoke intimately about his extracurricular activities such as caving, scuba diving, and search and rescue missions. He was very pleased with the opportunities that he had been provided with. Cedric believed that his life was more refined as a result of them, for he had been granted the privilege to experience the world from a range of diverse opportunities.

Being raised near a military community, Cedric had the opportunity to interact daily with many people from several different ethnicities. He developed meaningful friendships along the way. Regarding ethnic issues, Cedric's greatest concern was the global labeling that seemed to occur as a result of one individual's misbehavior. He was

personally committed to resisting societal biases. He wanted to be in control of his decisions.

Cedric's reactions to his social foundations course was different from Josh. He welcomed the information discussed in this class, claiming that it expanded upon his original perceptions. He spoke often about taking additional courses because he was concerned about his ability to perform effectively in classes with students from different ethnicities. Cedric stated that he was satisfied to be considered as one of many participants in life. He said that he did not need to be elevated above anybody in order to feel important. His belief was that people, who resist multicultural ideas, are those who are threatened by others sharing their power.

Experiences with diversity influenced pre-service teachers' philosophy of teaching

Experiences with diversity during the teacher preparation program influenced pre-service teachers' philosophy of teaching. Their thoughts about teaching were articulated in different ways, based upon occurrences within their lives. Although there is evidence of the influence of the family subculture present within these philosophies, it seems that the primary influence for them stemmed from their school subcultures. This theme will be discussed in relation to each of the five pre-service teachers.

Josh. From Josh's home and family subcultures he learned that the things that are important in life are obtained through determination and hard work. He was encouraged to pursue challenges and not to expect things to happen too easily. As a result, Josh perceived hard work as pertinent to developing sound character, thus his philosophy of teaching emphasized a commitment to hard work. Josh said that, as a teacher, he would motivate his students to apply themselves, allowing them to see the benefits that resulted from concentration and dedication. He wanted to teach his students to think like scientists. He believed that if students understood how science worked, they would be able to apply their knowledge, solving the most difficult science related problems. That's

how he learned it, and he considered himself to be quite successful. Josh firmly believed that all students could accomplish tasks if they had strong work ethics.

Jerry. From Jerry's family and home subcultures he was encouraged to prevail in spite of the circumstances. He learned that he had to ignore negative opinions if he were to be successful. He also learned that it would take hard work and determination. After constantly having to override the advice of certain administrators about avoiding science classes, Jerry prevailed. Thus, his philosophy of teaching centered around influencing the lives of students by planting an image of success in their minds. Jerry constantly spoke about the amount of time students spent in schools, claiming that teachers should also use that time to provide guidance. Jerry did not focus heavily on the teaching of Chemistry facts. He was more concerned about providing students with skills that would prepare them for life in society. Jerry believed that it was the teacher's responsibility to prepare students to live.

Kyle. Kyle's background experiences consisted of a supportive home environment where he learned to respect others and to be appreciative of the important things in life. In high school, Kyle had different experiences. He was labeled a non college bound student and encouraged to pursue a vocational track. Kyle struggled for acceptance, and after taking physics in undergraduate school, he recognized how detrimental those experiences were to his future. Thus, Kyle developed a philosophy of teaching that was inclusive of all students. Kyle's philosophy of teaching focused upon giving all students an opportunity to fail or succeed. His philosophy was to motivate all students, reassuring them that they could be successful in any field of their choosing. Kyle believed that teachers and administrators who prevent students from pursuing certain courses in life were tampering with their livelihoods. He did not believe that students should be confined to labels and tracking systems. Kyle resented these practices, claiming that they were a reflection of biases which could be very personal in nature, having nothing to do

with an individual's capability. He wanted teachers and administrators to be mindful of the power allotted to them, being careful not to misuse their positions of authority.

Tabitha. Tabitha's home environment provided her with the support she needed to assert herself in a male dominated field. Her ideas about teaching; however, occurred as a result of a variety of experiences in school. Tabitha recognized during her time as a student, that the classes that she enjoyed most and learned best utilized an interactive student centered approach for instruction. Thus, Tabitha's philosophy of teaching focused upon creating interactive learning environments. Tabitha resolved that in these settings, students enjoy learning because they are actively engaged. In her opinion, active involvement allows them to manipulate abstract concepts that would otherwise have no meaning to them. From her perspectives, interactive settings make learning relevant to the students' lives.

Cedric. Cedric's background experiences consisted of a supportive home environment where he was provided with opportunities to enjoy a variety of experiences. From that he developed into a very strong individual, who was very secure in his beliefs. From his high school experiences, Cedric discussed a variety of classroom memories that he considered as shaping his beliefs about teaching. He discussed teachers who were very rote in their presentation and requirements, as well as teachers who were less rigid, who expressed enjoyment in teaching. Cedric recalled his most memorable learning experiences to have occurred in classes where his teachers allowed them, as students, to connect with their lives as human beings. He believed that the personalities of the teachers were inviting to him, and encouraged him to want to do well, in order to please the teacher. Thus, Cedric's beliefs about teaching centered around developing positive student teacher relationships within the classroom. Cedric said that the teachers described above allowed the students to see that they also had feelings and emotions, that they weren't university trained robots. Those were the characteristics that he wanted to possess as a teacher.

<u>Experiences during the field challenged or confirmed preexisting beliefs</u>

      <u>Josh</u>. As the year progressed, Josh had several experiences which caused him to reconsider some of his original thoughts on diversity. His journey began at his first field experience. Josh said that he entered the school cautiously, feeling precarious about being accepted because he was Asian. Immediately, the faculty, staff, and student body welcomed him into their environment, easing his anxiety. Josh entered the setting with confidence. He became personally involved with the students. He saw the students as human beings with needs that he sometimes felt the school was ignoring. The warm welcome that Josh received at this school caused him to believe that focusing on ethnic diversity was unnecessary. There were very few ethnically diverse students. From his perspective, this was advantageous because there were not enough of them present to incite a disturbance. All seemed to have been well; therefore, there was no need for multicultural education.

      However, after submitting a letter to the school commending them for their warm friendly atmosphere, he had an encounter which jolted him. On the last day of his assignment, a student passed him in the hallway and referred to him using a derogatory racial slur. He was very disappointed, yet he realized a different focus for integrating diversity within the curriculum. From that experience, he resolved that multicultural education is useful for defeating the ignorance that divides people because of what they look like, instead of who they are.

      After the student aid experience had ended, Josh was further inspired by the students' voices in the portfolio. The voice that inspired him the most was that of an African American male student. This student was asking for acknowledgment for his struggle. He was overwhelmed by the outburst of attention given to negative examples. He wanted to see more attention directed towards highlighting positive images. It was that young man's opinion that the negative images overshadowed all of his efforts. Josh was impressed by this young man. He was touched by the emotions that emanated from

his voice. Josh said as a result of this experience, he had begun to look at multicultural education from a broader perspective. He used the term "heart" to describe his perspectives, signifying that he had begun to consider the issues from the individual's experiences rather than his own.

After the portfolio, Josh began his student teaching experience where he was confronted with a different aspect of diversity. Demographically, the school for Josh's student teaching experience was quite similar to his first field experience. He said that he was pleasantly surprised when he walked upon the first Asian student. Although ethnic diversity was minimal, Josh commented that there was much diversity among his students. He discussed differences in students' performance levels, commenting that he was learning to make adjustments in his teaching practices to successfully translate the information to all students. He said that he has learned that he must convince the students that they can learn the material. The most important lesson that Josh claims to have learned from this experience was not to make assumptions, or take anything for granted.

Jerry. From the beginning, Jerry's perceptions of diversity in the classroom centered around creating collaborative atmospheres where people could learn the truths about each other. He believed that diverse settings should capitalize by promoting understanding. Jerry was quite confident in his abilities to work in diverse settings. He spent much of his life being educated in settings where most people differed from him. However, when speaking of Jerry's perceptions, attention has to be directed towards his innermost beliefs, fueled by skepticism and distrust.

Jerry entered the school for his first field experience on guard. While he was warmly received, he questioned how much of his reception was genuine, considering the fact that he possessed an image that many people associated with negative things. After many successful days, and conversations, Jerry developed memorable relationships with the students, expressing concern for them, even after the assignment had ended. Although

being successful in this setting was never in question, Jerry's experience at this school addressed some of his early apprehensions in a positive way.

Jerry's reactions to the portfolio were affirming. He related the students' voices to his life, and elaborated on some of the emotional repercussions. Considering himself an introvert, he broke the silence by describing his personal feelings of hopelessness and helplessness. While doubtful about the outcome of possible resolutions, he firmly believed that collaboration and communication were the best ways to approach the problems.

As a pre-service teacher, Jerry entered with different expectations. The school to which he was assigned consisted mainly of African American students, and he was more certain that he would have an enjoyable experience there. It is important to mention that Jerry has always been confident in his ability to function; regardless of the setting; however, he considered his student teaching assignment to be a place where he would be free from judgment and scrutiny, for that was an acceptable place for him. It was where he belonged. Although in familiar surroundings, Jerry entered this student teaching assignment doubtful about his potential for effectiveness. Feeling a sense of identity with the thinking patterns of the students, he questioned whether or not he could motivate them to consider their time in his classroom valuable to them. He wanted to be a voice that they would respect, but was very doubtful about them listening. As the year continued, the relationships that he developed with these students caused him to realize that the messages from the old cliché, "they don't want to listen" had to be ignored in order to accomplish the tasks ahead. He found that his presence was inspiring, if not to mold them into future chemists or scientists, to motivate them to achieve.

Besides the changes associated with his initial perceptions of his ability to motivate the students, Jerry experienced another significant challenge to his beliefs. This challenge occurred as a result of the relationship that he developed with his secondary methods instructor, a Caucasian male. He often spoke well of him, commenting that he

seemed to be different from everybody else. Even in this relationship, the "system" had armed him to proceed very cautiously.

      <u>Kyle</u>. Kyle had some internal issues that guided his perceptions of diversity. He entered focused upon his experiences, determined to identify and combat issues that were of greatest concern to him. Upon entering his first field experience, his philosophy concerning the role of diversity in the classroom was specifically to control problems. Kyle saw no need to address diversity of any type unless there were problems. Kyle described calm environments as places where everybody was getting along, and nobody was hurting anyone's feelings.

      Coming from a rural setting and being discriminated against by individuals who were of his own ethnicity, Kyle had a different experience. He had to fight through labels for acceptance. Kyle entered his first field experience in an urban setting, uncertain of what to expect. He recognized immediately upon entering this setting that the students from this school differed from what he was accustomed to. Demographically, this school resembled his high school with a slightly larger percentage of ethnically diverse students. The culture was different, almost opposite to his home environment. Kyle described the students at this school as somewhat boisterous, void of a few manners.

      Kyle immediately focused his attention on two young male students who were doing poorly in the class. He worked diligently to motivate them. He perceived these students as outcasts who needed extra attention. They were not discipline problems. They never caused a disturbance. They seemed to fit in with the rest of the students; however, Kyle recognized that they were indeed different from the other students. They had different interests and different levels of motivation. He felt that the cooperating teacher may have been somewhat biased against them.

      As a result of dialogues between he and the students, he began to understand them and develop much respect for them. He resolved that the cooperating teacher might have had the same experience, had she taken the time to develop a relationship with them.

These students were dealing with issues that were beneath the surface. Kyle recognized that these issues needed to be addressed. As a result, he was able to recognize that surface observations can present images which interfere with teachers effectively addressing the needs of students.

"Science is knowledge and that should be all that's there. The only thing that we can do is just try to detect what is prohibiting this transfer of knowledge of science." In these statements, Kyle was giving his reactions to the concerns expressed by the voices in the portfolio. He said that it was unfortunate that multicultural education was an issue because it diverged the focus from the teaching of science. Kyle said that before listening to the students' voices, he considered multicultural education to be "trying to give everybody a piece of the action." At the end of the portfolio, he resolved that the most important messages related by the students centered around relationships and everybody getting along. Therefore, he concluded that there needs to be damage control in place so that everything can remain focused.

Kyle's student teaching assignment reminded him of home. There were a small number of students from different ethnic origins. At this school, Kyle's greatest concern was socioeconomic diversity. A few of his students used lap top computers in the classroom to take notes. Kyle was concerned about the messages given to the other students who were not as fortunate.

Kyle continued to discuss multicultural education in terms of controlling controversy; however, he seemed to have developed a more mature understanding. Neither of the field experiences that he discussed were situations of overt protests or objections; however, he identified the possibility of subtle messages being communicated within each, and decided to attend to them

Tabitha. Tabitha's first field experience was at a rural school, in an environment where the demographic makeup was quite similar to that of her high school. Considering that factor alone, some might believe that her adjustments within this setting would be

minor; however, Tabitha described her experience differently. The culture of the students within this setting were quite different from hers, and this school was saturated with the culture. Socioeconomically, many of the students were disadvantaged. Tabitha recognized quickly that if she was going to be successful in this setting, she would have to become acquainted with their culture. She realized that this would help to place her in a position of trust with the students, which is pertinent to developing good relationships.

Tabitha explained that her perceptions of developing relationships with students by becoming acquainted with important issues in their lives, was confirmed in the portfolio. She also recognized that an understanding of issues would be positive for the students' relationships as well. Tabitha observed in the portfolio one of the male students speaking about feminine issues. She resolved that this young man was provided a forum to understand the issues, because he spoke so favorable about them. Hence, Tabitha concluded that students need to participate in discussions that promote an understanding of each other.

As a student teacher, Tabitha was introduced to another phase of diversity, performance levels. Demographically, this school also resembled her high school. She was placed with mostly honors and advanced placement students, which is also a category of individuals to which Tabitha is familiar. These students; however, possessed a drive for achievement that was unfamiliar to Tabitha. Her inquiry into this matter indicated that the origin, of what she considered to be intense dedication, was their home environment. Tabitha, who entered very assured, fought to maintain that confidence, resolving that in order to be successful, she needed to always over prepare. Tabitha ended with a unique perception concerning the many faces of diversity and the significance of understanding to accommodate them.

Cedric. Cedric approached his experiences with an insatiable desire to be informed and to inform others. He considered it his responsibility, if he was going to be effective as a teacher. He entered his field experiences concerned about developing relationships

with his students, and fostering relationships between them. During his early field experience, Cedric grew from the altercation involving the student who admitted to being a Klan member. He was provided an opportunity to consider his role and possible resolutions that he would have made if he had been the teacher in charge. Cedric said that he left this experience pondering about how to confront students' choices constructively within the classroom setting. He realized that confronting these issues proved to be more difficult than he could have imagined. The greatest challenge for him was recognizing that he had to display the same respect to the student and his beliefs, that he wanted to promote within his classroom.

From the portfolio, Cedric was most impressed by the student who used the word children when speaking of the student teacher relationships. Cedric said that he always believed that teachers should support the total well being of their students; however, he said that the statement made by the student inspired him,. It brought to life his responsibility of nurturing and caring for his students, impressing upon him the importance of providing a safe environment for them to learn.

As a student teacher, Cedric felt compelled to share with his students a more inclusive representation of the subject matter. Periodically, within the lessons, he would share additional information relating to gender and ethnic issues to promote respect and understanding for diversity. Cedric's greatest concern about his future role was that he didn't know enough. He ended this experience contemplating enrolling in cultural related courses to increase his understanding of diversity issues. He believed that this knowledge would help him to decide how and where diversity should be situated within a classroom setting.

Crossing Borders

The experiences within the various subcultures influenced the pre-service teachers' beliefs, as well as their journeys across cultural borders. The extent of their travel across the borders directly relate to the identities framed in their life's experiences,

and their opportunities for experiencing diversity in their teacher education program (Appendix F).

Chapter V

Crossing Cultural Borders

Returning to the literature

The pre-service teachers entered this teacher education program with many preconceived ideas about their future roles as science teachers. Josh, Tabitha and Cedric entered quite certain of their abilities to perform successfully, while Jerry and Kyle entered concerned about whether their differences would interfere with their legitimization as teachers. Along with the preparation and planning for teaching responsibilities, they all shared in common the constant stress of having their ideas and performances validated for a declaration of acceptance in the profession.

This study, like the ones conducted by Nespor (1987), Brickhouse and Bodner (1992), and Jones (1991) explored teacher beliefs in an attempt to show relationships between the origin of the beliefs and their influence on instructional practices. The findings from each of these studies support the claim that teacher beliefs influence the ideas that teachers will consider as valid to their success in the classroom. This research differs in that it is an ethnographic study which uses a theoretical perspective of border crossings (Aikenhead, 1996, 1996) as a framework for exploring pre-service teachers' beliefs throughout a year long teacher preparation program in science education. This concept of border crossing suggests that transitions across the boundaries of subcultures can be difficult, due to challenges on lessons learned from within previous subcultures. This study focused specifically on the influence of the beliefs on the pre-service teachers' perceptions of the role of diversity in science classrooms, identifying any changes occurring within these beliefs as a result of border crossing experiences encountered throughout the year.

This study also focused on enculturation, alluding to the indoctrination of cultural ideas and values from subcultures in which all of the pre-service teachers have in common; however, the meanings that were being translated differed. Many times, the transmission

across cultural borders into different subcultures presented uncomfortable experiences for the pre-service teachers. This study provided a discussion of these processes from the perspectives of these teachers. In some cases, these transitions presented experiences that caused the pre-service teachers to expand upon or reconsider some of their original beliefs. The data provided by this study supported information from the literature regarding the influence of prior life and field experiences on teacher perspectives. However, this data expands our knowledge by introducing pre-service teachers as individuals, as well as showing how diverse experiences can influence preexisting beliefs. Indicated within this study was the role that these experiences had on the students' perceptions of themselves. Connections were found to exist between the beliefs and their stances on diversity.

Beliefs that lead to practice can be linked to early life experiences. Like the pre-service teachers in the McCall (1995) study, their articulation of their beliefs on diversity reverted to past experiences. Their beliefs on diversity clearly stemmed from early encounters within their subcultures. Some of the pre-service teachers discussed their beliefs in relationship to experiences they encountered with teacher practices in which they were considered to be successful or unsuccessful. Others formed their opinions based on other occurrences at school which impacted their lives in a different way.

Intertwined within the pre-service teachers' discussion about the role of diversity, was the pre-service teachers' images of themselves. How they were motivated to think about themselves was reflected in their discussions of the role of diversity. Their perceptions of their identities seemed to have provided a basis of support for their stances. When they addressed interventions, they either focused on reproducing images in which they perpetuated their own self-identity, or they focused on restructuring the environment in a way that prevented the reproduction of the images in an attempt to preclude negative experiences. The identities of the pre-service teachers served as a model for determining classroom effectiveness. According to Chevalier and Houser (1995), the

broader and more inclusive one's sense of identity, the more opened that individual is to diversity.

These pre-service teachers, in their journey beyond cultural borders, developed sensitivity and feelings of empathy as they were acquainted with the feelings of individuals from different subcultures. According to Chevalier and Houser (1995), new or different ideas can be perceived as threatening to some individuals. The perspectives that the pre-service teachers entered the teacher education program with provided safety nets and comfort zones for them. As a result of being in the teacher education program, they were exposed to different experiences which influenced their original beliefs.

Beliefs that suggest meanings which are different from what has been accepted can be threatening, because to some, it could imply that something is wrong with the original beliefs. A "normal" response to a perceived threat is blatant resistance. This response is often interpreted by some as rudeness or close mindedness; however, as this study indicates, it may or may not be indicative of a closed door. It can also be an indicator of fear due to perceived inadequacies about new or different information. Threats warrant the need for defense and protection. Evidenced throughout this study were feelings of unrest that the pre-service teachers faced whenever they experienced challenges to their beliefs.

As suggested by Nespor (1987), the pre-service teachers constructed their beliefs about teaching as a result of past experiences. This study revealed the influence of these beliefs, not only on instructional practices, but also on what the pre-service teachers were willing to consider as viable in education. The data from this study indicated that the pre-service teachers had deep underlying beliefs about what education should look like. Anything that did not seem to coincide with that image was considered deviant. As in most situations, the more rigid the belief, the less likely it was to be invaded by other beliefs, especially those which seem to deviate from the norm.

As in the Chevalier and Houser (1995) study, and the study conducted by Glasson and Lalik, (1993), the pre-service teachers, like the participants in their studies, redefined some of their beliefs about teaching as a result of different cross cultural experiences. In the Chevalier and Houser (1995) study, the pre-service teachers read passages which introduced different cultural issues. In this study, the students listened to the experiences shared by the African American students and the female students in the multimedia portfolio. All five of the pre-service teachers reported that the students' voices inspired them to revisit their beliefs.

While analyzing the data for this study, there were other ideas that surfaced which were particularly interesting. These ideas may suggest a need for further investigation. Discovered within this study were connections between ideas about the quality of the science curriculum and beliefs towards multicultural education. For example, Josh and Kyle considered science to be a conglomerate of truths. These individuals favored rigid methods of instruction leading to an absorption of scientific facts. Their determinant for effectiveness in teaching was ensuring that their students departed these classes demonstrating knowledge of the science concepts, characteristic of their particular disciplines. They were quite adamant about how intrusive these issues were in detracting attention away from the subject matter. Tabitha, Cedric, and Jerry searched for other meanings within the science curriculum. They were concerned about the other lessons that the students were learning in addition to the curriculum. These pre-service teachers were more opened to a critical analysis of science, as opposed to a rigid digestion of facts.

Interestingly, the manner at which the students' resistance to multicultural education resembled their resistance to other ideas such as diverse methods of instruction. Two of the pre-service teachers, Josh and Kyle, whose philosophies of science teaching represented a rigorous approach, consisting of the digestion and interpretation of scientific facts, had clearly defined perceptions concerning how to teach the concepts to the students. They found it difficult to entertain thoughts concerning effective teaching

models for science instruction, for it seemed to conflict with their goals, especially if the methods were presented as findings from educational research.

Finally, there were similarities and differences in the manner at which the pre-service teachers spoke of diversity. Jerry, unlike Josh, Kyle, Tabitha and Cedric spoke about the role of diversity in terms of societal influences. He perceived his struggle as existing outside of the confines of the school building. Throughout the study, he emphasized that all changes in schools relied heavily on the events occurring within society. The remaining pre-service teachers spoke of issues relating to diversity in terms of what they observed. Kyle and Josh saw no issues if there were no disturbances or complaints. Cedric and Tabitha addressed society in their discussions; however, they did not perceive society as being as powerful as Jerry did. They saw the schools as having power to effectively address diversity issues.

<div align="center">Implications for the future</div>

What do the findings of this study imply for the future? Are there implications for teacher education programs? Should pre-service teachers participate in action research to enhance their ability to function effectively in diverse settings? Although the pre-service teachers within this study did not become active participants within the communities of students, there is much to be said about the influence of the faces and voices of the students who were represented in the multimedia portfolio.

Should cultural studies be incorporated into pre-service teacher education programs? Would students benefit from discourses on the disequilibrium existing within society based on Bourdieu's (1977) discussions of cultural capital, which emphasizes the power possessed by science's primary stakeholders, those images portrayed in science as having more to contribute to its knowledge base? The data from this study indicated that two of the pre-service teachers, who had taken a class in social foundations, benefited greatly from the information obtained from the course. They departed from that course with a deeper understanding of the subtle messages embedded within the hidden

curriculum, and with a desire to learn more. According to Giroux (1995), cultural studies would require the students to explore the historical and political ramifications of pedagogy, recognizing that education is not a neutral process.

After presenting the multimedia portfolio at a conference, a science methods instructor informed me, during the discussion phase of this presentation, that the pre-service teachers at his school did not want to hear anything about multicultural education. After the morning session, he approached me, further elaborating on their perspectives, often equating multicultural education with affirmative action. He explained to me that it seemed to be, as I interpret it, another "minority" cry for extra help. I froze, not in personal offense to his statements, but in contemplating the reality of them. I began to think about the other messages that were being communicated to me, not just from the perceptions of the pre-service teachers, but also in the manner at which he represented their thoughts. I was left pondering about these beliefs, determined to understand them. I wondered why this teacher educator, and researcher felt comfortable rejecting multicultural principles in education during a time when diversity is increasing daily.

The data from this study provided me with an understanding concerning the beliefs of the secondary methods instructor and the pre-service teachers he claimed to represent. The stories of the pre-service teachers, involved in this study, indicated that crossing borders can be a very difficult journey. Enculturation within certain subcultures makes it difficult to understand the experiences of others within different subcultures. To be successful, there has to be a renegotiating of beliefs. Issues relating to diversity can be threatening to some people. According to Pajares (1992), people tend to hold on to their beliefs to avoid threatening situations. They tend to respond defensively.

As a result of this study, I was motivated to think more about the social aspects of learning and their role in teacher education programs. It seems practical that providing pre-service teachers with experiences which require them to explore and identify their own beliefs would enhance their abilities to be effective in diverse settings. Also, if

developing healthy citizens for society is considered a primary goal in education, there are many social factors which are required to accomplish this goal. While addressing effective presentation of content is very important, providing meaningful experiences for pre-service teachers to enhance their ability to accommodate students of diversity is also important. It seems that challenging and expanding beliefs is a major step towards the "whole" preparation of teachers to be effective in the years ahead.

With increasing numbers of students of diversity entering the classrooms, the demands in education are greater. Accommodating the needs of these students is an issue which merits undivided attention. According to Atwater (1986, 1995, 1995) and Melear (1995), in science, there needs to be attention focused on the biases within the curriculum, addressing how all students can be included. The science curriculum is void of the experiences of certain students, causing many of them to feel alienated from it. As a result, some students avoid it.

Banks (1989) and Gay (1994) discussed how multicultural education is the process by which all students are made to feel a viable part of the classroom. Multicultural education not only suggests the incorporation of diverse perspectives within the curriculum, but it also addresses the strategies used by the teachers. Inclusive atmospheres invite the participation of all students. Students who are participating in their learning are more likely to profit from their experiences.

The suggestions of the researchers concerning the need to incorporate diversity into the curriculum are well spoken. Certainly, the students who participated in the multimedia portfolio provided data which support their assertions; however, the participants in this research study provided different perspectives which warrant consideration. Importantly, the attention shifts from the intensity of the messages, and the needs of the students, to the audience to whom these messages are intended. The five pre-service teachers represented within this study are members of that audience. They are the minds to which these ideas must reach. This research gives attention to the

audience in a way that describes the complexity of their beings. The researchers are not simply speaking to an audience of concerned educators. They are speaking to individuals whose ideas have been formed by a wealth of experiences. As the findings of this study indicates, these experiences will either promote the acceptance of the ideas, or strengthen their resistance.

Much of the research exploring teacher beliefs focuses on teachers in practice. Conclusively, teachers' beliefs determine many of the practices occurring within the classroom. Confronting these issues with practicing teachers may prove to be quite difficult; considering that they are already situated in classrooms; however, pre-service teachers present a different challenge. Jones (1991) suggests that teacher educators should no longer assume that pre-service teachers think like them. Recognizing the impact that teacher beliefs have on instructional practices, she recommends that teacher educators devote more attention to identifying and motivating changes in beliefs. Preparing teachers for successful experiences within the classroom should be a major concern for teacher educators, and the beliefs influencing these decisions should not be ignored. Teacher beliefs are powerful. They play a major role in determining whether or not a student has a successful experience in the classroom.

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Appendix A

The diagram consists of a picture of a head with a ladder drawn through the center. Each rung of the ladder depicts behaviors that contribute to individuals' beliefs. On the first rung of the ladder, in the neck region, is the statement, "Observable "data" and experiences (as a videotape recorder might capture it)." The next five rungs of the ladder are located within the head region. They are: "I select "Data" from what I observe", "I add Meanings (cultural and personal)", "I make Assumptions based on the meanings I added," "I draw Conclusions," "and I adopt Beliefs about the world." The final rung of the ladder, located outside of the head at the top states, "I take Actions based on my beliefs." Encircling the back of the head is a reflexive loop which states, "our beliefs affect what data we select next time."

Appendix B

Purpose

The voices and experiences of minority students within science classrooms provide insightful information regarding multiculturalism in science education. The perspectives of minority students may serve to validate certain recommendations and theories of multicultural science educators, as well as communicate more effectively the needs of students. Past research has focused more on discussing multiculturalism from theoretical perspectives (e.g. Atwater, 1986, 1995; Aikenhead, 1996), rather than focusing on empirical studies that document the voices and experiences of minority students. The purpose of this research project was to give voice to minority students regarding their perspectives of teaching and learning in science classrooms, and interpret these voices with respect to recommendations provided by multicultural science educators.

Border Crossings

Many minority students entering science classrooms are crossing cultural borders from subcultures within the community, such as peers groups or families. For these students, western "school science" is a subculture, representing ideas and processes that are alien to the way of life of many minority students (Aikenhead, 1996). When crossing borders in the subculture of "school science," minority students are confronted with barriers that are difficult to negotiate and may prevent them from becoming encultured into the class. This concept of border crossing also provides science educators with perspectives which questions the presentation of science as an exclusive way of knowing about the world. The focus shifts from a cultural transmission approach to an analysis of the origin of scientific ideas, and how these ideas promote the legitimizing of some individual experiences while displacing others.

Tobias (1988) refers to "insiders" and "outsiders" in science classrooms. The insiders are those individuals who take for granted that they will do well in science and are willing to tackle science on its own terms. These students identify more with the processes and ideas of western science as it relates to their own subcultures. On the other hand, the outsiders are those students, many of whom may be minorities, who feel anxious during class and are unsure about their ability to do science, perceiving it as alien to themselves. The outsiders have no sense of identity with science. There are very few role models resembling "outsiders" within the curriculum, and when they are found, they are represented as exceptional or rare.

Evaluating the content of western science in relationship to cultural identities is an important consideration when helping "outsiders" cross borders into western science classroom instruction. From this perspective, not only are the cultural biases within the curriculum addressed, but also the subtle messages that students learn within the "hidden curriculum" (Apple, 1986). These messages infiltrate the subconscious causing students to acquire negative perceptions of themselves and their learning environments. As a result, minority students perceive themselves and their contributions as insignificant which could result in the development of inferiority complexes and low self esteem. Minority students may be influenced by negative perceptions and may refuse to embrace educational challenges (Atwater, 1986).

Methodology

Eight students from a program designed to recruit urban African-American students into science and mathematics teaching were participants in this study. This program focuses on increasing the numbers of minority teachers within schools at various localities throughout the state of Virginia. These students were both high school and college students. As potential minority educators, the students are provided with scholarship assistance in exchange for their commitment to service at schools in their communities. These students, considered "outsiders" to the subculture of science and mathematics teaching, were provided with role models, guidance, and experiences that were designed to motivate and provide opportunity to succeed.

The participants, director of the program, and a high school counselor were videotaped in interviews to discuss their perspectives of minority participation in science and mathematics classes. Students were asked questions ranging from their decisions to pursue or not pursue careers in science, to their preferred learning environments in science classrooms. They were given an opportunity to voice their opinions concerning the under representation of minorities in science related fields, and make suggestions for instructional activities and strategies. The videotapes were reviewed to document the voices of minority students as they tell the stories of their experiences in science education. Their responses were transcribed and interpreted from the theoretical framework of border crossing into the subculture of "school science." In this interpretation, data was organized into themes that emerged (Ely et al., 1991) with special attention given to the barriers that these students encountered as participants in science classrooms.

Results

Three themes emerged from the interpretation of the videotaped interviews: (1) Barriers to enculturation in science classrooms, (2) Learning preferences in the science classrooms, and (3) Developing student teacher relationships. These themes will be discussed from the students' perspectives who may be considered outsiders to the subculture of school science.

Barriers to Enculturation in the Science Classroom. Students have personal struggles within their own lives that inhibit their participation in science classrooms. These struggles may be the result of socio-economic pressures:

> It's hard for me being a black male, and having to keep, you have to guard yourself. You have to keep, you know . . . it's reputation. You have to have money. You know like, my family is struggling now, but I still come to school. I come to school, make my grades and work. And you know, I can do

all of this. I'd like to be praised for, you know doing all of this. (male high school student)

Other students who were interviewed expressed the need to be presented with images within the classroom that will invite and legitimize their presence.

> You don't really see that many rich black scientists out there or mathematicians. You only see people on the basketball court and everything. And I mean I see a lot of people at school. I talk to a lot of people who they want to, they have dreams of being in the NBA and everything.....And I mean, if we had more, like more famous black scientists to show them that there is like something else other than the NBA to show them there is a way to make more money than just like being in basketball or football and everything. . . there would be more black women and men in science. (male high school student)
>
> I think that kids will start to believe and start to think that they're inferior which is part of self esteem.   It's also part of a bad learning environment. Because if you think you're inferior, you're not going do as best as you could have if you thought that you were just up there with everybody else. Also, another thing, and this is going to sound strange, but when we read our books, our class books, all you see is white people, white people, white people, white people, if we want to get on this white black thing. And I mean, I don't like it. My little sister, she's nine, and she is in the fourth grade, and that's all she sees. And she came home, when she was in the third grade one day, and she said, "do black people not take pictures? (female high school student)

These students observed that for minority students to entertain the idea of becoming scientists, they must be provided with a learning environment which includes role models and encourages minority participation. The director of the program, concerned about inferiority complexes that could develop as a result of students not being enculturated within the classroom, made an appeal to teachers to directly address students' feelings:

> Teachers are able to pick up on inferiority and depending upon the orientation of that particular teacher, they will do one or two things. They will use that inferiority complexion to hold a student back, or they will look for ways to develop that inferiority into strengths that will make that student a better student. (program director)

Inferiority is a common barrier that students confront when crossing borders into the science classrooms.

<u>Learning Preferences</u>. Two students in response to questions regarding learning preferences indicated their need to be actively engaged in investigative learning activities. They discussed these preferences along with their benefits in the following statements: Upon completion of this study, the findings will be analyzed to determine areas for future inquiry.

> I guess I could see where the things that were in the book, what the teachers were telling me, what exactly we were doing. Because reading the words, I really didn't get as much from it. When I saw it and did the labs myself, I could tell the use. I could just see where everything was coming from. I can't say like when you're dealing with the formulas and stuff. That's something different. I can't really say that I can actually see that, but like when they're talking about motion, and with the spring, velocity acceleration and stuff, using slinkys.   I could see the amplitude and stuff by looking at it, instead of just looking in a book, reading it and say you know from the tip of one, from one tip to the bottom, or something like that. (undergraduate male student)

> ...had all this hard time with that lab. And as the hard time went, as they kept exploring, the reason why they had a hard time was because they totally disagreed with the answer that the computer was giving us. So, but by the end of the lab, they had, they learned that stuff so well, and they know. It's like they're still talking about it now in second period type of thing. So, I think the teacher should tell you the basics, tell you what can, what you can't do, what you definite you can't do, and tell you the stepping stones on how to get somewhere, and then let you do it. Because you know, I'm going to retain half of what I say to you today, but I'm going to retain all of what I did in physics because I did it with my hands. (female high school student)

Another student discussed the importance of cooperative learning to their understanding of science:

> ...but break into maybe pairs or something like that, or somewhere where you can, you will have more than just, not just working by yourself. You'll have like other people to help you out. And maybe it's something that you understand better than somebody else, then you can explain it to them. And if there was something you weren't too sure on, you be like, do you understand this, maybe you can help me out with this. Instead of just here's the work, here's the lesson. This is how you do this. Do questions 1-20, and then do

like the remainder for homework or something like that. I never liked that setup. (female undergraduate student)

On the subject of cooperative learning, the high school counselor viewed heterogeneous grouping as an important strategy for instruction in diverse classrooms. She explains that this strategy is useful for reducing students feelings of separation within the classroom.

And the way students feel that they feel a part of their classrooms, is that the teacher must involve all students. That can be done through activities, through group work, through seating arrangements. So when students come in the first day of school, you will observe, especially if there, it's a mixture. It's a large mixture. Students will tend to sit with their friends or sit in groups. I think it's the responsibility of the teacher to take a look at that and to arrange the instructional environment so that students will be seated in a learning environment that they will be altogether, so to speak. So that the teacher as she views her students will be teaching to all students. And this could be done through projects and activities, that there is no separation or feeling of separation.

Finally, students spoke of the need to make science relevant to their lives. For example:

Well, what I wanted to do was kind of like when I teach, relate math to the real world. I mean because you always see, you know like textbooks, you don't never see like companies and stuff, how people use math in the real world. That's what I want to do. (female undergraduate student)

These preferences of students are consistent with recommendations from science reform literature in science education (NRC, 1995).

Developing Student-Teacher Relationships. Another issue emerged which provoked much thought and the need for future inquiry. Students who were interviewed spoke frequently about their relationships with teachers, and how these relationships influence their desire to learn.

...like some of the teachers, like some of the professors, I have up here, I can tell there's certain ones where I've never been to their office. I never talk to them on the phone. I've never approached them after class. And those seem to be the classes that I'm having the most problems in. But as of right now, and they're not the hardest classes I have, which makes it so bad. Now, the classes that I have a lot of work in, that I have a lot of problems. I see, it's one

professor, I swear, I be in her office at least twice a week. (female undergraduate student)

I think that a teacher should get to know the student, as well as the student knowing the teacher instead of just doing it as a whole class. You know some students need special attention than others. You should be able to go to your teacher with a problem you're having in the classroom. You should be able to ask them a question that you don't understand. They should always be there for their children. (female high school student)

Because if you get along with your teacher, I mean, because I've had teachers that I didn't like, and I didn't make good grades in the class. If you like your teacher, you're going to basically, you won't be afraid to ask the teacher questions. And if you have a good relationship with your teacher, you would like, try to keep your grades up so that they won't disappoint the teacher, or whatever. That's how I feel about it. The teachers I didn't like, I really didn't get good grades. (male high school student)

These comments emphasize the importance of the role of the teacher in developing meaningful relationships with "outside" students. It's consequences are comprehensive extending beyond the processes occurring within the classroom. In discussing multiculturalism, the director of the program appealed to teachers to look within themselves and examine their own beliefs:

Multiculturalism boils down to an idea of accepting one on his or her own merit, and where that process begins is an internal process. It starts from the heart and unfortunately all of the reforms, and all of the things that you read in the literature about how things should go and how young people should be treated, and how they should view their counterparts, and how teachers should view students, and so forth and so on. Those things can be written out very nicely, and bound into beautiful textbooks, but until you are able to reach inside of a person and show them that thinking of others as you would have them think of you is a good thing, in that it not only helps the person who's on the other end, but it helps you.

Future Research. In today's society, students are confronting issues which seem to isolate and alienate them within their own cultures. They exist as subcultures within subcultures. During this study, the perspectives of students from an Afro-American subculture entering into "school science" subculture was documented.

However, future research should examine other subcultures who may be considered "outsiders" to the science classroom such as, rural students, students identified with learning disabilities, Native American students, Hispanic students, Asian students or students with social problems such as teenagers who are pregnant. Future research on multicultural education needs to address more closely the diverse nature of these subcultures from the students' perspectives

In this study, the students identified the importance of establishing a meaningful relationship with their teacher. This challenges science educators to examine their own beliefs concerning the enculturation of "outsiders" into their classrooms. Future research should focus on examining the philosophies and beliefs of teachers in relation to their influence on implementation of multicultural principles within the classroom.

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Appendix C

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Informed Consent for Participants
of Investigative Projects

Title of Project Influence of Pre-Service Teachers' Beliefs About Diversity on Science
Teaching and Learning

Investigator(s)Brenda R. Brand

I. The Purpose of this Research/Project

     The purpose of this project is to investigate the influence of pre-service teachers
background experiences on their beliefs about the role of culture and ethnicity in science
teaching and learning.

II. Procedures

     As participants in this research study, you will be interviewed via audiotape four
times throughout the school year. These interviews will occur before and after your
aiding
experiences and before and during your student teaching experiences. Initially, you will
be
asked questions concerning your experiences as students in science, and later you will be
asked questions relating to presentations and experiences while in the field. These
interviews will be from an hour to a half hour in length. They will occur in Derring 1096
at times that are convenient for the students.   In addition, observations of your classroom
and field experiences, as well as classroom writings and activity logs will be used as data
in this study.

III. Risks

     There are no identifiable risks to the participants.

IV. Benefits of this Project

     This project will provide useful information concerning the beliefs of pre-service
teachers and how they influence their perceptions of multicultural ideas.

V. Extent of Anonymity and Confidentiality

     Every attempt will be made to protect the identity of the participants. Despite
every effort made to preserve it, anonymity may be compromised.
You will not be identified by name. Audiotapes of interviews will be maintained by the

interviewer and will be kept in a secure place at the interviewer's home. The interviewer is
the only person who will have access to these tapes.

VI. Freedom to Withdraw

Participants are free to withdraw from this study at any time without penalty.

VII. Approval of Research

This research project has been approved, as required, by the Institutional Review Board for Research Involving Human Subjects at Virginia Polytechnic Institute and State University, by the Department of Teaching and Learning, and by the dissertation committee under the supervision of Dr. George E. Glasson.

VIII. Subject's Permission

I have read and understand the Informed Consent and conditions of this project.   I hereby acknowledge the above and give my voluntary consent for participation in this project.

If I participate, I may withdraw at any time without penalty.

_____   _____
            Signature   Date

Appendix D

(before fall semester field experience)

1. Where did you grow up?
2. How diverse was your community and school?
3. Describe your experiences in science classes in high school?
4. How were cultural and ethnic differences addressed in your school? in science classes?
5. Define multicultural education.
6. What role does culture and ethnicity play in science classes?

Interview 2 (after fall semester field experience)
1. What did you learn about diversity during this experience?
2. How was diversity addressed?
3. What role does culture and ethnicity play in science classes?

Interview 3(in the spring semester, after multimedia presentation)
1. Give your reactions to the presentation
2. How do the students responses compare to your own experiences?
3. What role does culture and ethnicity play in science classes?

Interview 4 (after the spring semester field experience)
1. What role did diversity play in the classroom?
2.   What did you learn from this field experience?
3. What role does culture and ethnicity play in science classes?

November 22, 1996

To whom it may concern:

 I have just completed the teacher aiding portion of the teacher certification process at Brookton Middle School (BMS) with Ms. Denise Watson as my cooperating teacher. When I began my experience at BMS, I was very shocked by the lack of ethnic diversity in the classrooms.

 I had completed my grade schooling in northern Mid-Atlantic state public schools. As you know, the Mid-Atlantic state's suburbs contain vast varieties of people from various backgrounds. Being of an Asian background, during my schooling I had to learn to overcome many ethnic prejudices and derogatory ethnic slurs.

 Wen I observed the ethnic make-up of the BMS student and teacher population, I became cautious. However, I quickly learned that I had no reason to be concerned. The students accepted me without exception. They welcomed me into their classroom and expressed the desire to have me help them with their learning experience. From my first day to my last, the faculty, staff and most importantly, the students made efforts to help me feel that I was a valued member of BMS. No single person acted in a manner that made me stand out as being different because of my ethnicity.

 I was judged by the way I conducted myself, my devotion to teaching, and my love for the students and their learning. For this I am very happy to say that the community of this county should be very proud of the students of BMS. Their maturity reflects highly upon their teachers, the administration and parents.

Appendix F

Crossing Borders					
Subcultures	Josh	Jerry	Kyle	Tabitha	Cedric
Family	• strong work ethics	• prevail in spite of circumstances	• good Christian values	• strong family support	• variety of experiences
Community	• altercations with African American peers	• Caucasian people have it better	• lower income	• primarily Caucasian	• multi-ethnic population
School	• very successful • considered "minority" as a label	• had to fight to take Science courses	• labeled non-college bound student	• male dominated classes	• multi-ethnic population
Peers	• gets along better with White peers	• good peer relation-ships	• many friends of same ethnicity	• primarily Caucasian	• lasting friendships with diverse groups
Media	• stereotypical associations of African Americans	• the White man's medium for inciting hatred	• not addressed	• not addressed	• not addressed
Crossing Cultural Borders	• trying to overcome tendency to label everyone the same	• had to learn how to navigate in white science teaching culture	• had to overcome feelings of inadequacy from rural upbringing	• had to ascertain her role as a female in a male dominated science field	• had to overcome frustrations with his ability in a culturally biased society

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Education

Doctor of Philosophy Candidate, Secondary Science Education, Virginia Polytechnic
Institute and State University. (May 1998)
Major: Curriculum and Instruction

Certificate of Advanced Graduate Studies(CAGS), Secondary Science Education,
Virginia Polytechnic Institute and State University.(Fall, 1997)
Major: Curriculum and Instruction

Masters of Arts in Education, Virginia Polytechnic Institute and State University
Major: Curriculum and Instruction
Spring, 1994

Bachelors of Science in Education, Delta State University
Major: Secondary Science Education
Spring, 1987

Certificate of Endorsement in Gifted Education, Delta State University
Summer, 1987

Bachelors of Science, Delta State University
Major: Biology with a minor in Chemistry
Spring, 1986

Professional Experience

Spring 1997	Graduate Assistant at Virginia Tech University.
	Responsibilities: Supervised and evaluated student teachers at area schools. Team taught methods course
Fall 1996	Graduate Assistant at Virginia Tech University. Supervised and evaluated student aides in area schools.

Fall 1995/Spring 1996   Virginia Quality Education in Sciences and Technology (VQUEST) Graduate Assistant.

         Responsibilities: assessment and to conduct research on the under representation of minorities and females in science and math classes.

September 1997-present
Montgomery County Schools
Science Coordinator K-12

Spring 1989   -Tazewell High School
Biology Teacher, grades 9-12.

August 1987-May 1988   McEvans Elementary School
Gifted Education Teacher, grades 4-8.

Summer 1987-   Shaw High School
Paul Purdy Enterprises-JTPA
Career Education Instructor-disadvantaged youths.

<u>Other Experiences</u>

Spring 1995   Conducted a research study on school support programs. Developed a model from the research.

Fall 1995   Evaluated VQUEST conference prepared a report using Excel spreadsheet of all workshops in the conference.

Spring 1996   Videotaped interviews for a research project for VQUEST, transcribed, and digitized videotapes using fusion recorder software.

Summer 1996   Developed a multimedia portfolio of videoclips using hyperstudio software. Transferred portfolio to CD using software to create a multimedia presentation of the

research.

<u>Professional Services</u>

March 1996   Evaluated papers submitted to the Virginia
                                    Junior Academy of Science (VJAS) for the
                                    1996 VJAS meeting.

Summer 1996   Presented multimedia portfolio on females
                                    and minority students' perceptions of
teaching and learning in science and math
classes to teachers at a two week summer
institute for VQUEST, the summer of
1996.

Fall 1996   Guest presenter in secondary science
methods aids course on the subject of
teaching students of diversity in science
education.

Spring 1996   Presented portfolio to secondary
                                    science methods student teachers on
                                    females and minorities' perceptions of
                                    learning in math and science courses.

Fall 1996   Presented multimedia portfolio to the
                                    elementary science methods class on
females and minorities' perspectives of
learning in science and math.

                                    Presented the multimedia portfolio for the
                                    Montgomery County Schools In-service
                                    program entitled "Teaching Science in our
                                    times: Meeting challenges from outside
                                    and from within."

Spring 1997   Presented multimedia portfolio separately
                                    to two elementary science methods classes
                                    and the secondary science methods classes

<u>Presentations</u>

Brand, B. & Glasson, G.E. (1996, October). Multicultural views on science teaching and learning. Paper and multi-media presentation at the annual mid-Atlantic meeting of the Association of Education of Teachers in Science, Hawks Nest, W.VA.

Brand, B. & Glasson, G.E. (1997, March). Minority Students Perceptions of Teaching and Learning in Science Classes. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Oak Brook, Illinois.

Brand, Brenda (1997, May). Pre-Service Teachers' Beliefs About Diversity. Paper
presented at the annual meeting of the Virginia Academy of Science, Blacksburg, VA.

<u>Professional Associations</u>

National Association of Biology Teachers   1996-present

National Association for Research in Science Teaching   1996-present

The Association for the Education of Teachers in Science   1996-present

<u>Award</u>

May, 1997   Best Student Paper Award at the Virginia Academy of
                            Science, Blacksburg, VA