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ADDRESSING DIVERSITY IN MEDICAL LABORATORY SCIENCE EDUCATION:
PERCEPTIONS AND PRACTICES

by

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Bachelor of Science, University of North Dakota, 2007
Master of Science, University of North Dakota, 2010

A Dissertation

Submitted to Graduate Faculty

of the

University of North Dakota

in partial fulfillment of the requirements

for the degree of

Doctor of Philosophy

Grand Forks, North Dakota

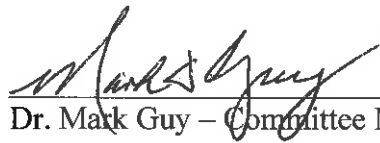
May
2017

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This dissertation, submitted by Christie L. Massen in partial fulfillment of the Degree of Doctorate of Philosophy in Teaching and Learning from the University of North Dakota, has been read by the Faculty Advisory Committee under whom has been done and is hereby approved.



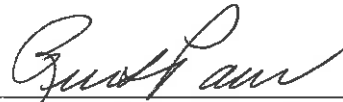
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Dean of the School of Graduate Studies

April 27, 2014

PERMISSION

Title Addressing Diversity in Medical Laboratory Science Education:
 Perceptions and Practices.

Department Teaching and Learning

Degree Doctor of Philosophy

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Christie L. Massen
April 24th, 2017

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To my husband, James, and my son, Roland.
I love you both!

ABSTRACT

Multicultural Education and Culturally Responsive Teaching methods have been available to assist educators in addressing diversity for a long time. However, the literature fails to address how diversity is being incorporated in laboratory science educational programs. The purpose of this study was to better understand Medical Laboratory Science (MLS) and Medical Laboratory Technician (MLT) educators' perceptions and practices. To understand what diversity in MLS and MLT education looks like, the following research questions were identified:

1. What are MLS and MLT instructors' perceived levels of importance for addressing the needs of an increasingly diverse student population?
2. How do MLS and MLT educators develop their understanding of cultural diversity?
3. How do MLS and MLT educators define and/or implement culturally relevant pedagogy?
4. How do MLS and MLT educators prepare their students to communicate with culturally diverse patients and members of the health care team?

In response to the research questions, the participants of this study asserted that addressing the needs of all students was important. The participants and related textbooks described many methods for addressing diversity in the classroom. However, most the participants felt that more could be done to prepare MLS and MLT students to

work in a diverse workforce and interact with a diverse patient population. Therefore, there is critical need to develop resources that can assist laboratory science educators as they work to improve multicultural competence and effective communication skills in MLS and MLT professionals which will ultimately contribute to a stronger laboratory workforce and the betterment of healthcare.

CHAPTER 1

INTRODUCTION

The definition of culture has evolved over time. Historically, Brown (1953) defined culture as “the class of responses of any hominid individual learned from any other hominid individual” (p. 215). In 1973, Geertz labeled these responses and standards of human interaction as “webs of significance” that influence an individual’s thoughts and behaviors. As years passed, Bennett (2001) added that culture is “society’s shared beliefs, social values, world views, and preferred standards of behaving” (p. 173). More recently, culture was defined as the outcome of how individuals interpret and make meaning of their surroundings, how they synthesize information from their own unique interpretations of, “...language, symbols, artifacts, customs, practices, patterns of interaction, shared values, norms, beliefs, and expectations” to create meaning (Guy, 2009, p. 14).

Culture plays a significant role in human kind’s daily activities and interactions, becoming apparent when individuals come together with diverse backgrounds, languages, customs, values, beliefs, and/or expectations. Any differences, constituted by a diversity of experiences, affect all areas of life and interactions among individuals. Educational endeavors are no exception to this. Culture and diversity play a huge role in an individual’s life. However, teaching and learning theories typically focus on the person, pushing cultural identity to often marginalized or forgotten about territory (Guy, 2009). Guy’s (2009) work asserts that educators need to focus on more than just the

person. It is critical to look at all aspects of culture and diversity when considering educational endeavors. Educational frameworks like Culturally Responsive Teaching (CRT) can help bring culture and diversity to the center of education (Gay, 2013; Ginsberg and Wlodkowski, 2009).

Research Purpose

The purpose of this study was to better understand Medical Laboratory Science (MLS) and Medical Laboratory Technician (MLT) educators' perceptions of an increasingly diverse student population and investigate if and how they were addressing the cultural needs of these groups. This was achieved by qualitatively assessing how MLS and MLT educators perceived of the changing environment of MLS education in community and technical colleges, and universities. In addition, the study sought to define and describe MLS and MLT educators' teaching methods used to address the needs of a diverse student population and prepare them for working in a field where communicating with culturally diverse patients and other members of the health care team was crucial to developing a more equitable health care system. As such, this research answers the following questions:

1. What are MLS and MLT instructors' perceived levels of importance for addressing the needs of an increasingly diverse student population?
2. How do MLS and MLT educators develop their understanding of cultural diversity?
3. How do MLS and MLT educators define and/or implement culturally relevant pedagogy?

4. How do MLS and MLT educators prepare their students to communicate with culturally diverse patients and members of the health care team?

In the following section, I will introduce current literature that relates to answering these important questions.

Equity and Diversity in Education Research: An Introduction to the Literature

The student population of the United States is becoming increasingly diverse (Wlodkowski & Ginsberg, 1995). Colby and Ortman (2015) report that “By 2044, more than half of all Americans are projected to belong to a minority group” (p. 1). Therefore, the student demographics in primary, secondary, as well as in higher education will also shift and become increasingly more diverse. This continuously evolving student population requires educators, programs, and institutions to address, define, and embrace an understanding of what it means to educate a diverse student body.

According to Carter and Welner (2013), “Educational disparities and intergenerational economic inequality are highly correlated with skin color, ethnicity, linguistic and social class status” (p. 1), and it is therefore important to address educational incongruences. According to a Department of Education (2013) report, 93% of White students completed high school, while less than 70% of all Latino students have similar success rates. The achievement gap between minorities and their White counterparts is evident in greater numbers in studies on post-secondary education, where research has found that Black, Latino, Native Hawaiian, and Native American minority groups are less likely to complete post-secondary education and hold a college level

degree than their White or Asian counterparts (Conchas & Gottfried, 2015; Lavin & Crook, 1990; Plaut, 2010).

Equality in education is critical to the success of all students. To achieve such equity, Gay (2003) speaks of the urgency of mending disparities among racial and ethnic groups, where classroom teachers and educators “provide students from all ethnic groups with the education they deserve” (p. 31) by making educational content accessible to all students.

Diversity in a student population includes, but is not limited to, ethnicity, socioeconomic status, race, gender, culture, experience, and learning styles. Each of these facets plays an important role in one’s learning. Gay (1973) asserts that “Education must be specifically designed to perpetuate and enrich the culture of a people and equip them with the tools to become functional participants in society” (p. 35). Committing to embracing a diverse student population and teaching them to function in a multicultural society can be difficult; however, it is crucial to the success of all students and citizens, as well as educational programs and institutions, that this goal be strived for (Gay, 2013; Ginsberg & Wlodkowski, 2009).

Each student carries with them their own unique cultural background that directly contributes to how they make meaning of information, therefore, in the classroom, “no learning situation is culturally neutral,” (Ginsberg & Wlodkowski, 2009, p. 7). With this notion, educators must reflect on how culture affects the learning process of their students and work to make the educational content accessible to those from all types of backgrounds. Throughout American history, the idea that culture and diversity plays a substantial role in the learning process has led educational scholars, like W.E.B. Dubois

(1932), to argue the need for social and cultural equality in schooling. This is critical in ensuring the success of all students, and in particular, minority students, whose culture and background may differ from the status quo.

Educators must go beyond simply discussing issues of racism, diversity, and inequality; they must "...appreciate cultural differences and accept the need to be reflective in their personal beliefs and professional practices" (Gay & Kirkland, 2003, p. 186). They should embrace a philosophy of *multicultural education* to truly engage diversity and promote equality in education (Gay, 2002, 2013). Currently, multicultural educational theories and methods exist for educators to maximize educational experiences for all types of students, and describe a wide range of concepts and ideas for addressing diversity in education.

Multicultural Education

Multiculturalism is a concept that addresses diversity in social interactions; it arose from social tensions at the beginning of the 21st century, just as the population across the United States was increasingly diversifying (Bennett, 2001; Plaut, 2010). To address the racial disparities in all areas of society, Plaut (2010) argues for a "diversity science" that "recognizes the intertwined roles of cultural and structural realities in shaping intergroup relations" (p. 77).

The concept of multiculturalism is not then specific to education, but is a conceptual framework for advancing teaching and learning endeavors beyond the basic content knowledge. In 1932, Dubois asserted that, "...college teachers cannot follow medieval tradition of detached withdrawal from the work" (p.71). Rather, educators must work beyond the curriculum and strive for equity in education and in society. In response

to this need, multicultural education philosophies have been developed to encompass the importance of social equity in education, as well as a high standard of academic achievement (Bennett, 2001).

In 1979, multicultural education scholar, Bennett, foreshadowed that multicultural competence would become a basic part of curriculum in her article, “Individual and cultural differences: A necessary interaction.” While primary and secondary education settings were the principal targets for these comments, many higher education programs have adopted multicultural competence as a part of their curriculum requirements. For example, current literature emphasizes the importance of including assessment of multicultural competence in medical schools and other allied health science programs to address racial disparities in the healthcare system (Beach et al., 2005; Betancourt, 2006; Betancourt, Green, Carrillo, & Ananeh-Firempog, 2003; Kumagai & Lybson, 2009; Paul, Ewen, & Jones, 2014; Seeleman, Suurmond, & Stronks, 2009).

In addition to curricular reform, multicultural competence, and societal equity, multicultural education emphasizes a need for “equity pedagogy” or “culturally relevant” pedagogy. Gay (2002) asserts that the goal of culturally relevant pedagogy is “reversing the underachievement of students of color” (p.1). It is from these theories of multicultural education and the need for equity in education that Gay (2003) and many other educators define *culturally responsive teaching* (CRT) as a method for addressing the importance of multicultural education at various educational levels (e.g. Crabtree, 2010; Gay, 1973, 2000, 2002, 2010, 2013; Gault, 2003; Ginsberg & Wlodkowski, 2009; Pappamihel & Moreno, 2011; Sealy-Ruiz, 2007; Sheared, 1999).

Culturally Responsive Teaching. CRT, a widely researched educational theory, “occurs when there is respect for the backgrounds and circumstances of students regardless of individual status and power, and when there is a design for learning that embraces the range of needs, interests, and orientations in a classroom” (Ginsberg & Wlodkowski, 2009, p. 24). Fundamental to CRT is placing the unique culture and background of each student at the center of his or her learning experience (Gay, 2000, 2002, 2013). Individuals inherently have previous experience and their own unique tools for making meaning from their surroundings. Research has found that if the classroom environment and educational expectations align with the student’s cultural background and meaning making, they are more likely to succeed; if not, they are more likely to struggle (Gay, 2002, 2013; Ginsberg & Wlodkowski, 2009; Villegas & Lucas, 2002). In other words, students experience a more privileged learning environment when their cultural background parallels the norms of the classroom, fostering an inequitable educational setting for those whose experiences lie somewhere along the margins. As such, it is important to place emphasis on individuals’ backgrounds and experiences to assist them in achieving academic success.

Addressing the Gap in the Literature

Much of the CRT literature is associated with primary or secondary education and preparing K-12 educators to be culturally responsive in their future classrooms. Some research has been conducted to assess CRT in higher education settings as it relates to a specific race or ethnic group (Gault, 2003; Pappamihiel & Moreno, 2011; Sealy-Ruiz, 2007; Sheared, 1999; Crabtree, 2010). For example, Gault (2003) and Pappamihiel and Moreno (2011) specifically address CRT as it relates to Latino(a) student populations in

colleges and universities. Sealy-Ruiz (2007) and Sheared (1999) look at CRT in relation to adult African American students. In addition, Crabtree (2010) focuses on CRT concepts utilized to engage Arab undergraduate students.

Assessing how CRT applies to specific racial and ethnic groups is important; however, because education is not culturally homogeneous, teachers must balance different racial and ethnic groups' learning needs at the same time. Therefore, it is imperative for them to look beyond a specific type of diversity or difference and identify how to make education equitable for all students. Nevertheless, little research has been conducted in higher education related to programs or disciplines dealing with culturally heterogeneous classrooms.

In Bennett's (2001) critical review of multicultural educational literature, she defines the "clusters" and "genres" of multicultural education. Ginsberg and Wlodkowski (2009) built upon these multicultural education genres to provide an applicable CRT theoretical framework usable in various areas of higher education. While many frameworks exist for utilizing CRT in higher education, their framework stands out from the others because of their incorporation of motivation and how it impacts learning. They assert that the following principles are important to the successful application of CRT in higher education: understanding the relationship between culture and motivation to learn, establishing inclusion, developing attitude, enhancing meaning, engendering competence, and implementing culturally responsive pedagogy.

All educational endeavors are unique; therefore, for practical application of CRT concepts, it is critical to assess how CRT relates to specific educational programs. Addressing diversity in education brings about two challenges. First, teachers are

challenged with addressing diversity and racial disparity in their classrooms. Second, educators also need to prepare their students to function in a diverse society.

Specifically, Medical and Allied Health Science Education programs must work to diminish racial disparities in their programs, while teaching technical and theoretical concepts related to each specific field, and implementing cultural competence to address the racial disparities that plague the health care system.

Medical and Allied Health Science Education. Medical and Allied Health Science Education programs train individuals for various professions in health care. The former trains physicians, while the latter readies medical professionals that include nurses, pharmacy technicians, radiology technicians, medical laboratory scientists, and medical laboratory technicians. Just as higher education is experiencing increased diversity among students, Medical and Allied Health Science Education programs are also experiencing increased change in their enrollment demographics.

An additional challenge that goes beyond training students in the core curriculum is preparing them to address racial and ethnic disparities in the health care system when they enter the workforce (Beach et al., 2005; Kumagai & Lypson, 2009). Beach et al. (2005) suggest that, “cultural competence on the part of health care providers and organizations may be one mechanism to reduce racial and ethnic disparities in care” (p. 2). Medical schools have begun to utilize cultural competencies to prepare physicians to treat culturally diverse patients (Beach et al., 2005; Kumagai & Lypson, 2009), however it is critical to encourage further cultural competence models, as well as other facets of multicultural education and CRT, in each area of Medical and Allied Health Science

Education programs. The current research associated with multicultural education, specifically CRT, for example, is non-existent in the field of MLS.

Medical Laboratory Science. MLS professionals make up a portion of the Allied Health Science group that provides information to physicians through laboratory test results (American Society of Clinical Pathology [ASCP], 2015), particularly in the diagnosis and treatment of disease (Blumen, Naud, Palumbo, McIntosh, & Wilcke, 2010). In addition to performing laboratory testing, MLS professionals provide direct patient care when collecting blood and other specimens for laboratory testing. Although the direct patient care performed by MLS and MLT professionals is usually short, it is important for them to possess a basic understanding of cultural diversity and communicate effectively to provide the best patient care services possible.

The laboratory science group includes professionals with a two-year Associate's Degree in MLT, a four-year Bachelor's Degree in MLS, or a graduate level degree with an emphasis in MLS (ASCP, 2015). The basic curriculum for the associate's and the bachelor's degree are similar in content, however the requirements vary in the depth necessary to demonstrate competency. According to the National Accrediting Agency for Clinical Laboratory Science's (NAACLS) (2012) report entitled "MLS Unique Standard C: Standards for accredited and approved programs," both MLT and MLS programs are required to provide entry level knowledge and skills in "communication sufficient to serve the needs of patients, the public and members of the healthcare team" (p. 10). NAACLS' (2012) "MLS Unique Standard C" particularly addresses the need to incorporate communication and interpersonal skills in program curriculum; however, it does not outline the type of communication skills required.

As the United States population becomes more diverse, the types of communication and interpersonal skills MLS and MLT students need exposure to shifts. The NAACLS' (2012) "MLS Unique Standard C" leaves room for each program to interpret and address this need in various ways. The current literature available fails to describe how MLS and MLT educators are meeting NAACLS requirements, as well as how faculty are preparing students to work with patient diversity.

Significance of Study

The need for this study was founded on two concepts: (1) the increasingly diverse student population in the United States, and (2) the growing need to work with and communicate with multicultural patient populations and members of the health care system. Regarding the first, supporting all students' needs is critical to their success. In order to do this, several things must happen to support learners. For starters, it is important to examine instructors' understanding of the relationship between culture and motivation to learn. It is also vital to assess how instructors establish inclusion, develop attitude, enhance meaning, and engender competence inside their classrooms (Ginsberg & Wlodkowski, 2009). The literature associated with diverse student populations and CRT is extensive, however current research on MLS and MLT pedagogy fails to address if and how these educational programs are addressing the current needs of culturally heterogeneous student populations.

The second reason for this study was to assess how laboratory science programs were preparing students to work with culturally diverse patients and other members of the health care team. Cultural competence is a key aspect of training healthcare professionals. While it is important for the members of the healthcare team that have the

most direct patient care to obtain high levels of cultural competence, it is critical for *all members* to effectively work and communicate with culturally, ethnically, and linguistically diverse patients and co-workers. While assessing other healthcare professionals for cultural competence, it is important for laboratory science educators to follow suit and begin a critical dialogue for the need of cultural competency curriculum and assessment of laboratory professionals during their education.

The Importance of CRT in MLS and MLT Education

It is vital that individuals, students, and instructors embrace the foundations of multiculturalism in their programs and institutions to create and support a constructive learning environment for an increasingly diverse student population. By understanding the current perceptions and approaches to educating a diverse student population and preparing students to work with culturally diverse patients, one can learn and understand the benefits, challenges, and outcomes of CRT as it relates to MLS and MLT education. Increased knowledge of CRT in MLS and MLT education will stimulate discussion of best practices, benefits, and challenges, as well as encourage educators to progress in the betterment of these programs.

This study synthesizes information about learning theories, current practices, and diversity in MLS and MLT programs to provide a description of the methodologies utilized to enhance student experience and understand cultural diversity. Implications may benefit current and new education faculty by enabling them to create, maintain, or review their courses through the CRT lens. In addition to assisting faculty, students can ultimately benefit from the utilization of multicultural educational theories throughout the

tenure of their MLS and/or MLT education programs, as well as throughout their careers working with diverse patients and members of the health care team.

Limitations

This study was limited to the scope of MLS and MLT education programs. Though I interviewed a diverse range of educators in terms of age, gender, ethnicity, and race, it was not possible to pool a representation of all groups. Not all MLS and MLT programs across the United States include the same type or level of diversity; therefore, not all participants had the same exposure to diversity in their teaching experience. In addition, I did not assess students' perceptions of multicultural education in this study.

Summary

Encouraging cultural competence is critical for laboratory science programs, particularly for MLS and MLT students. They must function in a diverse learning community, as well as be successful academically to complete the requirements of their program. At the end of an MLS or MLT student's tenure, they are expected to be able to function effectively in a diverse workforce. This means communicating effectively with co-workers and patients from various cultural, ethnic, and religious backgrounds. Consequently, it is critical for educators to help students navigate the challenges of culture and diversity in the learning process to help diminish the inequalities in healthcare when they enter the workforce.

The current literature associated with multicultural education and CRT is greatly lacking in the field of laboratory science. This investigation reveals significant findings into how laboratory science educators deal with diversity in the classroom, as well as encourage success of all students from the beginning of their learning through life-long application in the workforce and society.

Key Definitions

For the purposes of this study, I utilized the following definitions:

- Culture – “society’s shared beliefs, social values, world views, and preferred standards of behaving” (Bennett, 2001, p. 173).
- Multicultural Competence – is a skill set that “includes the ability to interpret intentional communications (language, signs, gestures), unconscious cues (such as body language), and customs in cultural styles different from one’s home culture” (Bennett, 2001, p. 191).
- Culturally Responsive Teaching (CRT) – “is an evolution of sound educational practices that respects the principle that all cultures are significant to the construction of knowledge” (Ginsberg and Wlodkowski, 2009, p. 283).
- Ethnic Identity – “identification of a larger society whose members are thought by themselves and others, to have a common origin and to share segments of a common culture and who, in addition, participate in shared activities in which the common origin and culture are significant ingredients” (Yinger, 1976, p. 200).
- Learning Community – “the relationships and interactions among people through which knowledge is primarily generated” (Palloff & Pratt, 1999, p. 15).

CHAPTER 2

LITERATURE REVIEW

As the United States population and student demographics become more diverse, faculty must move beyond encouraging cultural acceptance to a higher level of understanding and appreciation for one another to truly address the role cultural diversity plays in teaching and learning and to provide equitable education to all students (Gay, 2002, 2010, 2013). To accomplish the demands of curriculum requirements and incorporating the teaching of skills related to the education of diverse individuals, it is critical for teachers to be effective and maximize learning opportunities. Many learning and student development theories are available for instructor use; however, most do not address student diversity and how it affects teaching and learning. Yet, multicultural education and culturally responsive teaching encompass multiple ideas and concepts that strive to improve educational equity and improve learning opportunities for all students.

Multicultural Education

Multicultural education lends itself to assisting educators in encouraging cultural competence, but also reducing educational disparities. Bank's (2015) asserts that "A major goal of multicultural education is to reform schools, colleges, and universities so that students from diverse racial, ethnic, cultural, linguistic, and social-class groups will experience educational equality" (p. 54). Reflecting upon the education of minorities to identify areas in need of improvement, while addressing those inequalities, is essential to meeting the goals of multicultural education (Cochran-Smith, 2001). A teacher's

reflection on the education of minorities and the importance of addressing the needs of all students is the critical first step to promoting educational equality. Through a critical analysis of multicultural education literature, Bennett (2001) outlines multicultural educational foundations in the following four principles: “(a) theory of cultural pluralism; (b) ideals of social justice and the end of racism, sexism, and other forms of prejudice and discrimination; (c) affirmations of culture in the teaching and learning process; and (d) visions of educational equity and excellence” (p. 173).

Bennett’s (2001) first principle is the need for cultural pluralism. In Nieto’s (2009) review of multicultural education literature, she defines pluralism as the need for people of different cultures/backgrounds to “live together with common ideals and in the best interests of the public good” (p. 79). Theories of cultural pluralism have been identified, interpreted, and transformed by scholars throughout the history of education by scholars like Kallen (1924), W.E.B. Dubois (1961), Takaki (1989), and Ruiz (1991) and is one of the major goals of multicultural education. The importance of cultural pluralism underlines Bennett’s (2001) second principle of social justice and equality, which calls for equality that extends beyond racism to all forms of discrimination. From there, Bennett’s third principle asserts that the reduction of inequalities found in education is essential for successful learning. The discussion of racial inequalities originated with movements away from Eurocentric foundations, extending to all forms of diversity in society throughout the years (Baker, 1983; Forbes, 1973; Gay, 1973; Suzuki, 1984). This vision of educational equity and academic excellence that can be achieved through multicultural education is the foundation of Bennett’s fourth principle. Combined, these principles make up the core goals of multicultural education.

In addition to the ideals of cultural pluralism and educational/societal equality, Bennett (1979) and Gay (2013) assert that culture plays an important role in teaching and learning. Bennett (2001) defines culture as “society’s shared beliefs, social values, world views, and preferred standards of behaving” (p. 173). One does not learn without the influences of these social values, worldviews, and standards of behaving; therefore, they directly affect the teaching and learning process. Bennett (1979) and Gay (2000, 2013) also describe the importance of striving for academic excellence in equal opportunities for learning for all students to effectively meet the core principles of multicultural education.

Summarized into twelve “genres” or educational philosophies, Bennett’s (2001) conceptual framework defines the core goals of multicultural learning. These twelve educational philosophies exist within the following four over-arching “clusters”: (1) curriculum reform, (2) equity pedagogy, (3) multicultural competence, and (4) societal equity (Bennett, 2001). Each of the four clusters combines similar concepts and topics and together outlines the requirements for successful application of multicultural education.

Cluster 1 – Curricular Reform

To address the concepts of curricular reform, it is assumed that “knowledge is contested and constructed,” as well as “a Eurocentric curriculum in the United States is a tool of cultural racism” (Bennett, 2001, p. 172). Bennett (2001) asserts that, for educators to work towards curricular reform, one must: (1) understand historical events that pertain to other cultures, (2) work to eliminate bias in content, books, and instruction and (3) understand the goals and principles of curriculum theory.

Historical Inquiry. To fully achieve curricular reform, educators must go beyond understanding history and how historical events as well as different perceptions and opinions of these events affect everyone's culture and background and work to embrace history and culture in education (Banks, 1993; Gay, 2000, 2010, 2013). Therefore, it is important to use teaching materials that are accurate and provide a neutral perspective of the event. Research shows that a centrist paradigm is critical to the inclusion of diversity and diminishing white supremacist notions in education (Asante, 1991). "The centrist paradigm is supported by research showing that the most productive method of teaching any student is to place his or her group within the center of the context of knowledge" (Asante, 1991, p. 171). To encompass a centrist paradigm in the classroom, Bennett (2001) asserts that educators should strive to understand and respect all cultures and facilitate a multi-centric curriculum.

Detecting Bias in Textbooks and Materials. An additional tool that is useful in achieving curricular reform is to assess and eliminate bias in textbooks and education materials. The Council of Interracial Books for Children (CIBC) bulletin (1977), "...strongly supports the regulation of instructional materials selection to ensure that educational materials reflect the reality of a pluralistic society as perceived by all groups." However, King's (1992) assessment of educational materials found many issues and inappropriate representation of African American, Native American, Hispanics, and Latinos in textbooks. These studies display the repeated usage of inapt materials and the need for accurate representations of historical events from a variety of cultures and perspectives within textbooks. It is important that teachers incorporate material that utilizes appropriate characterization, language, historical authenticity, cultural accuracy,

and suitable illustrations. To achieve curricular reform, it is important to select textbooks that provide an accurate portrayal of historical events from all angles and opinions rather than a one-sided approach, as well as include diversity in the content and pictures. By eliminating biases and encompassing educational materials and instruction from multiple cultural perspectives, educators can make the educational content more accessible to all students.

Curriculum Theory. Curriculum theory is an additional approach to achieving curricular reform. There are five types of knowledge that affect the curriculum of multicultural education: (1) cultural knowledge, (2) popular knowledge, (3) academic knowledge, (4) transformative knowledge, and (5) school knowledge (Banks, 1993). Utilizing a meta-analysis, Okoye-Johnson (2011) concluded that curricular interventions utilizing concepts of multicultural education were successful in reducing negative racial attitudes. More specifically, it was more successful in student groups aged 9 to 12-years-old in urban areas. While the goals and theories of curricular reform have been established, Bennett (2001) describes how it has been hindered by national standards in K-12 education; however, higher education is not as restricted and allows for more progress as it relates to curricular reform.

Curriculum reform is critical to the successful application of multicultural education. It relies heavily on educators' awareness of historical events affect teaching and learning, as well as the multiple cultures that make up their student body. It also requires educators to be aware of how they utilize material in their classroom and work to eliminate bias in content, books, and instruction, as well as understand the goals and principles of curriculum theory.

Cluster 2 – Equity Pedagogy

According to Banks and Banks (1995), equity pedagogy can be defined as “teaching strategies and classroom environments that help students from diverse racial, ethnic, and cultural groups attain the knowledge, skills and attitudes needed to function effectively within, and help create and perpetuate a just, human, and democratic society” (p. 152). Equity pedagogy looks specifically at how school and classroom climate, student achievement, and cultural styles affect teaching and learning (Bennett, 2001). To address the concepts within equity pedagogy, it is assumed that: (1) “all children have special talents and a capacity to learn,” (2) “the major goal of education is to enable all children to reach their fullest potential,” and (3) “cultural socialization and a sense of ethnic identity influence the teaching and learning process” (Bennett, 2001, p.172).

School and Classroom Climate. When working towards a positive and accepting classroom climate, educators must facilitate positive teacher-student relationships, as well as encourage affirmative relationships among students. Scholars like Allport (1954) and Schofield (1995) focus on *social contact theory* to help describe and achieve a constructive climate in the classroom. Social contact theory focuses on how the classroom climate and group interactions affect learning. For example, positive group interactions that include diversity are needed to develop a positive attitude towards the group. Bennett (2001) asserts that the following four conditions are needed for a positive climate to flourish: “a) opportunities to become acquainted and develop friendships; b) equal status among students from the different groups; c) experiences that require intergroup cooperation; and d) authority figures that encourage, model, and

support intergroup cooperation” (p. 184). It is within this positive climate that promotion of learning can occur.

Research shows that classroom climate can change from grade to grade. Therefore, it is important that institutions work as a whole to create a positive student climate not only within each grade, but also throughout students’ tenure at a particular institution. When the climate changes in the classroom or between grades, it can hinder learning. For example, Katz’s (1999) ethnographic study of Latino students in K-12 education depicts how teachers’ perceptions and practices extend beyond the classroom and reach the structure of the school. He found that students did well in kindergarten through fifth grade but struggled in grades six through eight. This was due to the fact that, in grades six through eight, they felt discriminated against by their teachers. Katz (1999) asserts that this perceived discrimination leads to student disengagement, and that the structure of the school must strive to support them at each stage of their educational advancement. Consequently, it is important for teachers to facilitate a positive learning environment in the classroom as well as throughout the institution.

Student Achievement. In addition to focusing on the cultural climate of the classroom and school to adequately facilitate equity pedagogy, Gay (2000) asserts that educators must strive for academic excellence and work to “reverse the underachievement of students of color” (p. 1). To be successful in meeting the needs of historically underserved students, one must utilize the principles of culturally relevant pedagogy through the framework of culturally responsive teaching (Garcia, 1999; Gay, 2000, 2013; Ginsberg & Wlodkowski, 2009; Irvine, 1990). “Through culturally relevant pedagogy, students maintain or develop cultural competence, as their culture becomes a

vehicle for learning, and they experience genuine academic success” (Bennett, 2001, p. 186). The success of developing cultural competence in students is one of the core goals of multicultural education.

Lee’s (1995) experimental study examined if utilizing culturally relevant pedagogy improved academic success among African American students in a world literature class. Based on the quantitative data collected, Lee identified a statistically significant gain in achievement among students exposed to experimental curriculum that included culturally relevant pedagogy. Lee (1995) also used qualitative data to illustrate additional academic achievements, asserting the importance for educators to understand language capabilities of diverse students. As such, the use of culturally relevant pedagogy improves student achievement.

Cultural Styles in Teaching and Learning. Cultural teaching and learning styles also play an important role in multicultural education. The preferred learning styles for different racial/ethnic groups have been well studied and each group shows. For example, Boykin and Toms (1995) define the common themes of preferred learning styles among African American students and assert that student learning increases when pedagogy is compatible with cultural styles. Howard’s (2001) qualitative study of 17 African American students also suggests that students preferred learning when teachers (1) were caring, (2) established a community type classroom, and (3) made learning fun.

To address these genres of multicultural education and preferred learning styles, educators must be “culturally responsive” (Gay, 2000, 2013), encourage cultural competence, and understand cultural styles in teaching and learning. In a two-year ethnographic study of teachers conducted by Ladson-Billings (1994), she makes clear the

important for educators to be aware of how societal culture affects learning and facilitates culturally responsive teaching to enable students to succeed both academically and in society. Teacher participants in her study described how they strove to encourage their students to become agents of change in society rather than simply conform to the culture of the majority.

Equity pedagogy plays an important role in multicultural education. It encompasses more than just equitable access for all students. To be successful in the application of equity pedagogy, and to meet the overarching goals of multicultural education, educators must assess and address any issues in classroom climate, student achievement, and cultural styles that affect teaching and learning.

Cluster 3 – Multicultural Competence

Bennett (2001) defines multicultural competence as, “the ability to interpret intentional communications (language, signs, gestures), unconscious cues (such as body language), and customs in cultural styles different from one’s home culture” (p. 191). Within the concepts of multicultural competence, it is assumed that “the reduction of racial and cultural prejudice is possible and desirable,” and “individuals can become multicultural; they need not reject their familial worldview and identity to function comfortably in another cultural milieu” (Bennett, 2001, p. 172). Multicultural education and culturally responsive teaching scholar, Gay (1995), noted that cultural competence is a large component and important goal of multicultural education. She asserts that the purpose of teaching students about multicultural competence is so that they learn to understand and interact with individuals that differ from them. Children are often not

exposed to ethnic and cultural diversity in their formative years; therefore, it is extremely important to incorporate those skills in their educational endeavors (Gay, 1995).

Utilizing Bennett's (1993) developmental model of intercultural sensitivities, along with Banks' (2002) framework for multicultural education, Lobb's (2012) qualitative study concluded that multicultural educational courses increase students' multicultural self-awareness – one of the major components of multicultural competence. Bennett (2001) asserts that to achieve multicultural competence, one must understand 1) ethnic identity, 2) the importance of prejudice reduction, and 3) ethnic group culture.

Ethnic Identity Development. Ethnic identity is defined by Yinger (1976) as “identification of a larger society whose members are thought by themselves and others, to have a common origin and to share segments of a common culture and who, in addition, participate in shared activities in which the common origin and culture are significant ingredients” (p. 200), and is central to how students learn. The current literature associated with ethnic identity, as it relates to teaching and learning, emphasizes the importance of knowing and understanding one's students as a whole. Because it plays a key role in learning, educators may need to assist students in developing their ethnic identity.

To assist students in developing their ethnic identity, student development theories are designed to identify and understand cultural distinctiveness that ultimately helps individuals develop and advance throughout their education. These theories can also help educators understand their own ethnic identity and respond appropriately to their students. While there has been some debate in the literature throughout the years, it is generally accepted that educators must “recognize the value of the whole person

concept and the theory that contributes to an understanding of students' growth and change" (Evans, Forney, Guido, Patton, & Renn, 2009, p. 49).

To appropriately utilize student development theories, it is important to consider several environmental factors that contribute directly to students' progress. These factors include challenge and support, involvement, marginality and mattering, and validation (Evans, Forney, Guido, Patton, & Renn, 2009). Students must be ready to participate in learning activities, as well as experience an optimal level of challenges – not too much and not too little (Sanford, 1966). Astin (1984) asserted that students need to be involved in their development process and educators must provide multiple opportunities for their engagement. Feelings of marginality or not fitting in can be detrimental to a student's learning and development process (Schlossberg, 1989). In addition, students must feel validated in their ability to succeed in their development and learning endeavors (Rendon, 1994). All these items combined can affect a student's in their education; therefore, it is critical that educators reflect on their practices and make sure that these environmental factors are helping, and not hindering, their students.

Cluster 4 – Societal Equity

Within the concepts of societal equity, it is assumed that “societal change is a necessary condition to bring equitable education access, participation and achievement” and “societal equity (change) is possible and consistent with basic democratic values and the American creed” (Bennett, 2001, p. 172). Bennett's (2001) societal equity “cluster” goes beyond education in the classroom and stretches to address issues in society. These societal issues include (1) demographics, (2) culture and race in popular culture, and (3) social action.

Demographics. As previously mentioned, the population of the United States and the student population are becoming increasingly diverse. This diversity is the driving force for the need of cultural pluralisms. It is therefore critical to address diversity in the classroom. In the multicultural educational clusters one through three, many different reasons and approaches to addressing diversity are described. However, in addition to the clusters outlined above, multicultural education must reach beyond the classroom and look at the basic demographics of society and within educational institutions.

Culture and Race in Popular Culture. One of the goals of multicultural education is to limit stereotypes and/or culturally offensive material in coursework and educational tools; however, educators must take into consideration the effects of trends in popular culture. For instance, it is important not to distort or inappropriately portray cultures when working to achieve multicultural competence. Failure to remove stereotypes may perpetuate a false stereotype that cultural competency tries to reduce (Bennett, 2001). Instead, the current literature stresses the importance of encouraging students to understand their own cultural identity and work to diminish racism or inappropriate portrayals of race and culture in society.

Social Action. Orfield (1988) concluded that there is a need to address reform in educational policies to help address issues of dropout rates and educational disparities among low-income student families. In addition, policy reform that relates to minority recruitment and retention are greatly needed to address the concepts of the societal equity.

Verkuyten and Thijs' (2013) study utilized a multilevel analysis that included quantitative data to assess multicultural education and its effects on inter-racial attitude. They found that classrooms that utilized multicultural education resulted in students with an increased understanding of culture that ultimately resulted in an anti-racist overtone in the classroom. While the former researchers' work was conducted outside of the United States, Zirkel's (2008) study conducted within the United States also concluded the positive impacts that multicultural education had on inter-ethnic relationships.

The literature and theories associated with Bennett's (2001) conceptual framework of multicultural education are vast, revealing the positive impact that multicultural education has on promoting educational equality. Bennett (2001) summarizes these principles as "a) theory of cultural pluralism; b) ideals of social justice and the end of racism, sexism, and other forms of prejudice and discrimination; c) affirmations of culture in the teaching and learning process; and d) visions of educational equity and excellence" (p. 173). While the theories and principles of multicultural education are both foundational and contain descriptive goals, the literature fails to fully address how educators utilize and apply these principles in their classrooms in various areas of education. Still other educational theories encompass the foundations of multicultural education while discussing practical application in the classroom. An example of this is culturally responsive teaching.

Culturally Responsive Teaching

When compared to traditional teaching methods, Culturally Responsive Teaching (CRT) is more complex, because it relates to knowledge, background, learning environment organization, and desired outcomes (Ginsberg & Wlodkowski, 2009). CRT

concepts encourage educators to strive to be effective facilitators, while encouraging cultural acceptance and understanding beyond the students' tenure in education. Many elements of teaching are required to incorporate students of all backgrounds into a functional, learning community.

Ginsberg and Wlodkowski (2009) describe diversity from an educational perspective as more of a call to action rather than an idea; they state, "diversity conveys a need to respect similarities and differences among human beings and go beyond sensitivity to active and effective responsiveness" (p. 8). Several other authors have defined and outlined the requirements for successful CRT in various areas of education. Gay (2002, 2013), for example, proclaims that the following five elements are crucial to achieving success in utilizing CRT in the classroom: (1) develop a cultural diversity knowledge base, (2) design culturally relevant curricula, (3) demonstrate cultural caring and develop a learning community, (4) cross-cultural communications, and (5) ethnic diversity in the delivery of instruction. Gay (2002, 2013) described CRT in primary and secondary education, however her approach to overcoming cultural disparities has been utilized and adjusted to various settings. CRT has been utilized in teacher preparation with the intent to prepare pre-service teachers with the tools needed to utilize the concepts of CRT in their future classrooms, for example.

Teacher Preparation

The concepts of CRT are regularly discussed in higher education literature as it relates to the preparation of teachers in primary and secondary education. According to Pugach, Blanton, and Florian (2012), "equipping teachers for the full range of diversity of students in today's schools has long been a shared concern among teacher educators"

(p.235). The goal of preparing teachers to work in diverse settings is to enable “teacher candidates to access and develop experiences with the aim of knowing, doing, living, and becoming individuals who can interact, tolerate, and be advocates for various students” (Smith, 2013, p. 30).

Villegas and Lucas (2002) put forth six essential components of CRT in teacher preparation. They stress that culturally responsive educators: (a) are socio-culturally conscious, (b) have affirming views of students from diverse backgrounds, (c) see themselves as responsible for and capable of bringing about change to make schools more equitable, (d) understand how learners construct knowledge and are capable of promoting knowledge construction, (e) know about the lives of their students, and (f) design instruction that builds on what their students already know while stretching them beyond the familiar (p. 20)

To prepare teachers for educating a diverse student population, educators work to instill cultural competence in their candidates through specially designed curriculum. However, outcomes have varied greatly. McAllister and Irvine (2000) argue that variability occurs due to a focus on content rather than process. Other scholars have looked to see how moral values and cultural perceptions affect teacher-student interactions. Pantic and Wubbels (2012) noted that. “positive associations were found between teachers’ liberal beliefs and the metacognitive and motivational components of cultural competence” (p. 451).

As the world becomes more diverse, it is increasingly important to address cultural competence and acceptance of all types of diversity. Research shows that diversity other than racial, ethnic, and cultural can affect student learning. For example,

homophobic issues can influence lesbian, gay, bisexual, transgender, or questioning students throughout their education (Banks & Banks, 2007). Controversial issues like this are in constant evolution and can change rapidly, therefore it is important for educators to be prepared to deal with a changing environment and provide their students with the tools and abilities to do the same.

The current teacher education literature plays an important role in understanding the purpose and core principles of CRT in higher education. While it is significant to prepare K-12 teachers with the tools to apply CRT principles, it is also critical to expand the understanding of CRT to higher education.

Higher Education

Many different views about how to approach CRT in higher education exist in the current literature, with authors agreeing that the theory begins with the instructor.

Instructors must feel motivated to embrace CRT and possess a strong understanding of the diverse cultural backgrounds represented in their classroom (Gay, 2000, 2002, 2003, 2010, 2013; Ginsberg & Wlodkowski, 2009). Without a teacher's desire to accept diversity and develop a learning community, the concepts of CRT disintegrate.

Instructors need a strong appreciation for culture and possess a cultural knowledge base to be successful in these methods (Gay, 1975, 2010).

Many frameworks for approaching CRT exist but these frameworks tend to be specific and related to a particular facet of learning. Jabbar and Hardaker's (2013) qualitative work, for example, utilized Gay's (2002, 2013) and Villegas and Lucas' (2002) characteristics of CRT to develop a framework for implementing CRT in business education. Their five pillars of CRT are (1) cultural consciousness, (2) resources, (3)

moral responsibility, (4) cultural bridging, and (5) higher education curriculum. Their study found this a useful framework; however, it focused on education in business schools alone.

The fundamentals of each authors' approach to CRT in various arenas of education are consistent and their goals are similar, yet each identifies unique qualities or components of what makes their particular framework successful. Ginsberg and Wlodkowski (2009) provide a framework for CRT in higher education that emphasizes the importance of both teacher and student motivation.

Ginsberg and Wlodkowski's Elements of CRT

Ginsberg and Wlodkowski's (2009) book, *Diversity & Motivation: Culturally Responsive Teaching*, provides a theoretical framework that encompasses the fundamentals of both multicultural education and CRT in higher education. This framework stands out from others because it includes the importance and role that motivation plays in the practical application of CRT that can, in theory, be utilized in all areas of higher education. With the overtone of motivation, there are four foundations of Ginsberg and Wlodkowski's (2009) work: (1) establish inclusion, (2) developing a positive attitude toward the learning process, (3) enhance meaning, and (4) engender competence.

Establish Inclusion

Higher education institutions typically offer a wide range of educational options for students. One may pursue a specific degree that is required for a professional specialty, while others may wish to participate in life-long learning or acquire a new hobby. Some students take a course to meet institutional standards that may or may not

be part of the core learning required for a specific degree. The reason and motivation for taking a course are different for each individual; therefore, it is important for educators to understand each student's motivation for learning in order to help them feel included and promote knowledge development.

A student's sense of community and connectedness is central to feelings of inclusion, and contributes to their motivation to learn. Gay (2002) stresses that educators must demonstrate that cultural caring is essential to building a learning community – one of the foundations of CRT. To be successful at implementing CRT in the classroom, culturally responsive teachers need to possess both a sense of community and a desire for equity (Ginsberg & Wlodkowski, 2009). Gardner (1990) describes the importance of constructing mutual connectedness amongst members of a community. Ginsberg and Wlodkowski (2009) likewise affirm that, "It is in community that we find security, identity, shared values, and people who care about one another" (p. 73). This sense of inclusion in the learning community is critical to a student's willingness to actively participate and influences their ability to comprehend material.

Develop Attitude

Ginsberg and Wlodkowski (2009) describe the need for learners to "develop an attitude" – a positive attitude – that encourages students to identify the relevance or personal relatedness of course material. A sense of personal relevance is directly related to the motivation to learn and bringing out curiosity in individuals.

Communication plays a large role in all areas of life and CRT is no exception. In fact, cross-cultural communication is an essential element to the successful application of CRT (Gay, 2002, 2013), one where language plays a significant role in developing the

attitude and implementation of both multicultural education and CRT (Schoorman & Bogotch, 2010). To enhance cross-cultural communication, it is important to use language that is appropriate, culturally relevant, and accessible. This is especially true when dealing with English Language Learners (ELL). An example of culturally relevant language is the use of feminine and masculine variations of words. Ginsberg and Wlodkowski (2009) believe that using linguistic and contextual support in assignments and lessons can aid ELL's in the learning process and encourage language development in addition to the ideas or objectives of the lesson.

Another key aspect of achieving a positive attitude and sense of control in students is by varying classroom opportunities and allowing them to choose the method or style of learning that they feel is most relevant to them (Ginsberg & Wlodkowski, 2009). Providing examples of previous students' high-quality work can be very helpful in developing a positive attitude; these examples allow students to interpret a tangible expectation of the assignment requirements and foster motivation and empowerment (Ginsberg & Wlodkowski, 2009).

Similar to the principles of multicultural education, Gay (2002, 2013) finds that utilizing culturally relevant curricula is also vital in encouraging a positive attitude toward learning. When selecting or reviewing course materials, it is important to avoid "controversial issues such as racism, historical atrocities, powerlessness, and hegemony" within those materials (Gay, 2002, p. 108). He also recommends focusing on accomplishments or successes of multiple groups, especially of color, rather than a select few. In addition to encouraging attitude, utilizing culturally relevant curricula will also help students enhance the meaning of the topics under discussion.

Enhance Meaning

In addition to building a sense of attitude, passion, or control over one's learning, it is important for educators to enhance meaning for their students through "norms, procedures, and structures that expand, refine, or increase the complexity of what is learned in a way that matters to learners, includes their values and purposes, and contributes to a critical consciousness" (Ginsberg and Wlodkowski, 2009, p. 164). In other words, by enhancing meaning in the content, students may gain a better more positive attitude towards their learning.

Cultural congruity, or a sense of feeling that the educational content is culturally relevant, is essential to enhancing meaning in the learning process. Gay (2002) asserts that focus needs to be on the delivery of instruction, which should match the individual learning styles of each individual students. Some cultures prefer community learning while others prefer to learn independently. Gay (2002) noted, "cooperative learning arrangements and peer coaching fit well with the communal cultural systems of African, Asian, Native, and Latino American groups" (p. 112). It is important to take these unique preferences and characteristics into consideration when teaching and try to provide varying opportunities to learn differently.

Research shows that different preferences or learning styles can help enhance meaning for various groups or cultures. Allen and Boykin (1992) noted that utilizing dramatic elements in teaching, via music and movement for instance, resulted in increased performance in African American students. Gay (2013) asserts that teachers need to work towards a multiculturalism approach to their curriculum to address all types of diversity encountered in their classroom.

Experiential learning is an additional way to enhance learning. Ginsberg and Wlodkowski (2009) recommend the Kolb Model. Smith and Kolb (1986) described a model of learning that contains the following components: 1) concrete experience, 2) observation and reflection, 3) formation of abstract concepts and generalizations, and 4) testing implications of concepts in new situations. The model emphasizes the need for flexibility in the classroom and learning process. As the students move through the Kolb model and lesson to be learned, there needs to be flexibility to adapt to cultural needs of students. In addition, this model is helpful to help educators adapt to different learning styles of students (Ginsberg & Wlodkowski, 2009).

Engender Competence

Ginsberg and Wlodkowski (2009) assert that authenticity and effectiveness are two outcomes of successful assessment of the course content that engenders competence in students. Assessment activities can help students feel connected to their learning and achievements. To be successful in teaching the concepts of cultural diversity, Gay (2002) emphasizes that educators have a cultural diversity knowledge base, as well as mastery over the content knowledge. Competence starts with understanding the basics and implementing the information regularly to demonstrate maintained competence. From there, Villegas and Lucas (2002) call for professional development associated with enhancing the model of culturally responsive teaching and the associated curriculum.

As there is a great deal to be learned by each student, as well as the teacher, it is important to approach learning as a collaborative endeavor between all members of the learning community. This may include teachers utilizing assessment methods as interactive activities to identify proficiency. It is important that teachers identify

proficiency and competency throughout the learning process and provide feedback to the students regularly.

Ginsberg and Wlodkowski's (2009) framework, based on strong foundational concepts of multicultural education and CRT, can be utilized throughout the disciplines of higher education. However, this may be, the current literature lacks evidence of how their framework manifests in various educational disciplines. The authors acknowledge the difficulty and societal pressures surrounding the implementation CRT; it requires a change that is not always widely accepted.

It can be difficult to incorporate CRT in an extremely structured curriculum like math and science because the demands of the curriculum may leave little room for working on the ideals of cultural competence. However, Gay (2002), Ginsberg and Wlodkowski (2009), and Nicol, Archibald, and Baker (2013) agree that CRT applies to all disciplines including the disciplines of math and science. Assessment of students' levels of multicultural competence is an additional consideration to make when incorporating CRT into one's curriculum.

Multicultural Competence Assessment

Bennett (2001) defines multicultural competence as, "the ability to interpret intentional communications (language, signs, gestures), unconscious cues (such as body language), and customs in cultural styles different from one's home culture" (p. 191). In addition, Gay (1995) asserts that the purpose of promoting multicultural competence is to demonstrate how to understand and interact with individuals that differ from themselves. The participants of this study all agreed that this is a vital component of higher education

and should be included in laboratory science education programs as the students will eventually be working with a diverse patient population.

In addition to addressing diversity in the classroom and preparing students to work in a diverse society, assessment of one's level of multicultural competence is important. Multicultural competence tools are available to assist educators with assessing their own and students' level of multicultural competence. While there is debate about the best tool to utilize, the overarching theme is that an assessment tool can help students understand their level of multicultural competence and assist them identifying their individual areas of strength and weakness (Betancourt, Green, Carrillo, and Ananfeh-Firempong, 2003).

Medical education and nursing education both utilize multicultural competency assessment tools. Betancourt, Green, Carrillo, and Ananfeh-Firempong's (2003) study identified three major areas where intervention is needed to improve healthcare and diminish disparities. They assert that "organizational, structural, and clinical competence interventions can facilitate the elimination of these disparities and improve care for all Americans" (Betancourt, Green, Carrillo, and Ananfeh-Firempong, 2003, p. 293). From there, they assert that healthcare needs an increase of diversity in healthcare leadership, increased interpreter services for healthcare providers, and cultural competence among healthcare providers (Betancourt, Green, Carrillo, and Ananfeh-Firempong, 2003). This cultural competence is needed to diminish the clinical barriers of healthcare. Betancourt, Green, Carrillo, and Ananfeh-Firempong (2003) assert that, "cultural competence efforts are to enhance provider knowledge of the relationship between sociocultural factors and

health beliefs and behaviors and to equip providers with the tools and skills to manage these factors appropriately” (p. 118)

It is important for educators to go beyond simply teaching students about various cultures and their characteristics (Betancourt, 2006). Betancourt (2006) identified the goal of cultural competence as “quite simply to assure that health care providers are prepared to provide quality care to diverse populations” (p. 499). The literature provides many tools exist for assessment of cultural/multicultural/intercultural competence. Many of the publicly available tools are self-assessment tools. Seeleman et al. (2009) provided a framework for cultural competence in medical education. The frame work included the following six components:

1. “Knowledge of epidemiology and the differential effects of treatment in various ethnic groups;
2. awareness of how culture shapes individual behavior and thinking;
3. awareness of societal context in which specific ethnic groups live;
4. awareness of one’s own prejudices and tendencies to stereotype;
5. ability to transfer information in a way the patient can understand and to use external help when needed; and
6. ability to adapt to new situations flexibly and creatively” (Seeleman et al., 2009, p. 229).

The framework focused on interactions between the physician and patient. Seeleman et al. (2009) emphasized the importance of using this framework to ensure that all “aspects of cultural competence are being given proper attention and to find out whether there are

any blind spots to, or underemphasized aspects, cultural competence in medical education” (p. 236).

Nursing programs also require cultural competencies. Calvillo et al. (2009) described an initiative, driven by the American Association of Colleges of Nursing (AACN) in 2006, to prepare culturally competent nursing professionals. They recommended the following five competencies:

1. “Apply knowledge of societal and cultural factors that affect nursing and healthcare across multiple contexts;
2. Use relevant data sources and best evidence in providing culturally competent care;
3. Promote achievement of safe and quality outcomes for diverse populations;
4. Advocate for social justice, including commitment to the health of vulnerable populations and the elimination of health disparities; and
5. Participate in continuous cultural competence development” (Calvillo et al., 2009, p. 139-140).

Calvillo et al. (2009) described assessment options associated with cultural competence, and warned against the use of self-assessment tools. Cultural competence self-assessment scores tend to not match patients’ ratings related to their perception of a nurse’s level of cultural competence (Calvillo et al., 2009; Tongue, Epps, & Forese, 2005). Alpers and Zoucha (1996) found a correlation between increased exposure to diversity tends to decrease a person’s cultural competence self-assessment score. Calvillo et al. (2009) reported that patient perception is one of the best methods of assessment of cultural competence; however, there are limitations to this method of

assessment as well. Many factors can affect a patient's perception making it hard to correlate their opinions to cultural competence. Therefore, Calvillo et al. (2009) asserted that both qualitative and quantitative methods for assessing cultural competence are important.

As with medical education, there is debate about the best method for cultural competence assessment for nursing programs. Garneau and Pepin (2015) argued for a constructivist definition of cultural competence. They asserted that "adopting a constructivist perspective makes possible the development of the concept of cultural competence by considering different ways of knowing in the discipline" (Garneau & Pepin, 2015, p. 14). According to Garneau and Pepin (2015), this approach lends itself to critical reflection, ethical reflection, and ultimately the promotion of social justice.

Beach et al. (2005) provided a systematic overview of 34 articles related to cultural competence methods. They sought to summarize and identify methods utilized in healthcare education. The authors asserted that competence training impacts health care professionals' knowledge, attitude, and skills. However, their study concluded that there is "little uniformity across studies in measurements of outcomes, making it difficult to determine which specific types of knowledge, attitude, or skills are impacted by cultural competence training" (Beach et al, 2005). Beach et al. (2005) highlighted the importance of cultural competence training and recognize the difficulty in comparing tools for effectiveness. Seeleman et al. (2009) also described the difficulty of incorporating multicultural competence tools into medical education, and noted that teaching about multicultural competence tends to be fragmented.

There are many tools available for healthcare educators. However, tools are specifically designed for individual professions. Laboratory science education is unique and requires a unique method for approaching cultural competence. The identification of a cultural/multicultural competence tool for MLS and MLT educators may help faculty accurately assess competence of their students and train laboratory professionals who will work to reduce healthcare inequalities in the United States.

Multicultural Competence Program Assessment

MLS and MLT programs must review their curriculum and assess diversity content. To assist programs in reviewing curriculum for diversity and cultural competence content, the Association of American Medical Colleges (AAMC) provides resources for creating tools to assess cultural competence training (TACCT) and guidelines for preparing and completing a TACCT instrument. The “TACCT is a 67-item self-administered assessment tool that can be used by medical schools to examine all components of the entire medical school curriculum” (AAMC, 2017). TACCT is a resource to “identify gaps and redundancies in their curricula, gather information from various stakeholders - students and faculty, and serves as a blueprint of where, what and when cultural competence content exists in the curriculum” (AAMC, 2017). This is particularly useful when preparing for accreditation. These tools and resources may help guide MLS and MLT program tool creation.

The AAMC TACCT includes five domains to assess courses. Each domain is outlined by knowledge, skill, and attitude topics and objectives. The five domains are: (a) cultural competence, rationale, context, and definition; (b) key aspects of cultural competence; (c) understanding the impact of stereotyping on medical decision making;

(d) health disparities and factors influencing health; and (e) cross-cultural clinical skills (AAMC, 2017). This tool also describes an overview of the knowledge, skills, and attitudes to include. For example, the first domain should cover the definition of cultural competence, definitions of race, ethnicity and culture, and clinicians' self-assessment and reflection. Refer to Appendix E to review the AAMC TACCT and additional information about each domain.

Additional program assessment tools are available. For example, Lie et al. (2008) provided a TACCT that includes six domains; it can be utilized by medical schools and other allied health science programs. Lie et al. (2009) created a validated tool that varies from the AAMC TACCT; it is a smaller tool with only 42 learning objectives. Again, this tool may be utilized as a template for MLS and MLT programs.

In summary, multicultural assessment tools can help students reflect on their perceived levels of multicultural competence. Self-assessment tools help the students understand how well they embody the values of multicultural competence. There is debate over what tool is best, but nursing programs and medical schools successfully use many of these tools. It is important for MLS and MLT programs to meet NAACLS requirements related to diversity. Tools like the AAMC TACCT help program administrators and educators refine diversity and multicultural competency topics within courses and throughout their MLS and MLT program.

The volume of information about multicultural education and CRT and its relation to various educational areas provides a clear indication that the basic core concepts of CRT provide guidance to faculty in addressing student diversity, promoting learning, and working towards educational equality. Still, the current literature fails to address some of

the specific and unique needs of various educational programs. Nicolescu (2010) asserts that multicultural education principles must expand across disciplines. Each program area, specialty, or profession will have its own unique requirements or methods of best practices designed to specifically deal with the unique nature of the program. Therefore, it is important to define how the concepts of multicultural education and CRT manifest in specific program areas.

In addition to the need of educational programs to address disparities in specific program areas of education, inequalities are also noted in other areas of life. Healthcare is another well-documented arena for having issues with access and equality (Kumagai & Lybson, 2009). Therefore, it is especially important for healthcare educational programs to address diversity in their offered platforms for the success of their students. It is also equally critical to provide cultural competence education to those future healthcare professionals.

Medical and Allied Health Sciences

As the U.S. population becomes more diverse, healthcare takes on new forms as the patient population also becomes increasingly diverse. Many scholars and professional healthcare organizations describe the inequalities they witness in the healthcare, and call for the need of social justice throughout the larger system (Kumagai & Lybson, 2009). They feel that it is imperative that everyone, no matter their cultural background, has access to equitable healthcare. To meet these demands, the notion of cultural competence and associated ideas must begin with the training of healthcare professionals. During one's training, individuals must learn to interact and provide

equitable healthcare to culturally diverse individuals; this includes but is not limited to, educational learning communities, society, and the workplace.

Medical and Allied Health Science Education encompasses a wide range of fields that educate and train medical professionals to provide high-quality healthcare. Healthcare professionals include but are not limited to physicians, physician assistants, pharmacists, physical and occupational therapists, respiratory therapists, nurses and nurse assistants, medical laboratory scientists and phlebotomists, and medical transcriptionists (ExploreHealthCareers.org, 2012). All healthcare professionals require some form of training that may range from informal, on-the-job training, to formal education in advanced as doctoral level degree programs. All Medical and Allied Health Science Education programs are very specialized. Working in each profession requires specific training in that specialty area. For example, to work as a physician, one must successfully complete medical school; to work as a medical laboratory scientist, one must successfully complete medical laboratory science training (American Society of Clinical Pathology [ASCP], 2015).

Medical and Allied Health Science Educational programs have similar concepts and ideas related to the physiology of the body in health and disease states, diagnosis of disease, treatment, and prevention. Each unique specialty plays a role in the overall healthcare of the patient. For example, the physician makes decisions about diagnosis and treatment, gaining information from Allied Health Science professionals (i.e. nurses, radiology, occupational therapy, physical therapy, and medical laboratory scientists, etc.) (ADEA, 2012). With all the information provided from supporting areas, a physician can

make diagnosis and treatment decisions. In other words, all roles of the medical community are important to overall health and wellness of the patient.

Medical education programs address diversity in their programs by teaching their professionals how to handle the various cultural norms that their patients or co-workers may adhere to when they enter the workforce (American Medical Association [AMA], 2006). Likewise, medical schools and nursing programs assess their students using standardized cultural competencies in their programs. However, within the current literature, there is a lack of discussion related to how cultural competence and diversity are addressed in Allied Health Science Education programs other than in the two programs mentioned. Specifically, the Medical Laboratory Science education literature fails to address how its educators to facilitate learning within their diverse student population and prepare students to work for a diverse patient population.

Medical Laboratory Science

Approximately 70% of all medical diagnoses are made based on laboratory test results (Erharbor & Charles, 2012). These results enhance the medical care of the public and come from laboratory professionals, such as Medical Laboratory Scientists and Medical Laboratory Technologists (Blumen, Naud, Palumbo, McIntosh, & Wilcke, 2010). Medical Laboratory Science (MLS) and Medical Laboratory Technician (MLT) professionals are typically categorized into a larger group of healthcare professionals commonly described as Allied Health Sciences or Diagnostic Services (ASCP, 2015).

MLS and MLT professionals perform laboratory testing on human samples that range from blood to various body fluids. Laboratories range in size from small clinic laboratories to large reference laboratories. These laboratories perform simple, moderate,

and complex analysis (American Society for Clinical Laboratory Science, 2015).

According to the Centers of Medicare and Medicaid Services (CMS) (2015), the Clinical Laboratory Improvement Amendments of 1988 (CLIA) requires that all laboratories that perform human testing must apply for and maintain a CLIA certificate. Without a current CLIA certificate, laboratories are not legally able to perform testing on human samples and report results.

Education

Medical Laboratory Technologists are individuals that have completed an Associates of Medical or Clinical Laboratory Technician degree at an accredited college or hospital-based program. Medical Laboratory Scientists are individuals that have completed a Bachelor's degree in Medical or Clinical Laboratory Science at an accredited college, university, or hospital-based program (ASCLS, 2015). After completing the appropriate education, one must then attempt the national Board of Certification (BOC) examination offered by the ASCP (2015). Only after successful completion of a laboratory science educational program, and passing the national certification examination, will one be able to work in a clinical laboratory setting. Beyond a bachelor's degree, MLS professionals may advance their studies further by obtaining a master's degree or doctoral degree (ASCLS, 2015).

Currently, published research and literature about MLS and MLT education are limited. No literature exists that describes what multicultural education or culturally responsive teaching looks like in a diverse classroom of MLS and MLT programs. The MLS and MLT educational literature fails to address the unique needs of a diverse student population in highly specialized laboratory science education programs. This

study aims to gather information about current practices and perceptions of addressing student diversity needs and cultural competence in MLT and MLS programs (American Society for Clinical Laboratory Science, 2015).

Summary

“Our student populations and the developmental issues they confront are more diverse and complex than ever in the history of higher education” (Evans, Forney, Guido, Patton, & Renn, 2009, p. xvii). The majority of educational institutions support the notion that education should be accessible and equal to all students, yet the application and approach to meeting this goal differ in each institution and discipline (Ndura & Dogbevia, 2013). Therefore, it is becoming more important to assess and address diversity, development issues, and cultural competence in various institutions and disciplines. While true for all areas of education, it is critical for MLS and MLT educators and program directors to implement diversity training in their classrooms and programs, as well as prepare their students to participate in multicultural work and healthcare settings. It is vital that educators work to help diminish inequalities in both education and healthcare systems.

CHAPTER 3

METHODS

According to Creswell (2012), “qualitative research is an inquiry approach useful for exploring and understanding a central phenomenon” (p. 626). To accomplish the task of assessing the depth and understanding of the phenomenon, a researcher will collect information from participants in many different ways. This type of inquiry includes, but is not limited to, interviews, observations, document review, personal interpretation, and reflection. Many different approaches to qualitative research exist. The phenomenology genre of qualitative research, which I used for the purpose of this study, “seeks to explore, describe, and analyze the meaning of individual lived experience” (Marshall & Rossman, 2016, p. 55).

This investigation utilized a phenomenological approach to collect data related to how MLS and MLT educators perceive, describe, feel, and make sense of diversity in the classroom. In addition, this approach granted me a better understanding of how perceptions, challenges, benefits, and practical application of CRT affects MLS and MLT education. Phenomenological qualitative methods were used to collect data from MLS and MLT educators. I identified participants using the Clinical Laboratory Science Educators Listserv and interviewed them using open-ended questions until saturation occurred. Data collected were analyzed using phenomenology to address the following research questions:

1. What are MLS and MLT instructors' perceived levels of importance for addressing the needs of an increasingly diverse student population?
2. How do MLS and MLT educators develop their understanding of cultural diversity?
3. How do MLS and MLT educators define and/or implement culturally relevant pedagogy?
4. How do MLS and MLT educators prepare their students to communicate with culturally diverse patients and members of the health care team?

To begin addressing these research questions, I conducted interviews with MLS educators about their views of the changing student population and educational practices following Ginsberg and Wlodkowski's (2009) framework of CRT. Questions examined participants' perceptions of diversity within their classrooms and programs, their use of multicultural competence assessment tools, and their perceptions and practices associated with diversity in the delivery of instruction. After data collection, interviews were transcribed and analyzed for reoccurring or common themes. This information was then synthesized into a general summary of the role that CRT plays in the education of future MLS and MLT professionals.

Theoretical Framework

As mentioned in the introduction, the theoretical framework for this study is based in CRT. Many authors have written about CRT for primary and secondary education, however Ginsberg and Wlodkowski (2009) are of the few who describe CRT as a method or tool for addressing cultural diversity in higher education. Emphasizing the importance of culture and the role of motivation in CRT approaches, their framework

requires establishing inclusion, developing attitude, enhancing meaning, and engendering competence. Their framing of CRT guides this study. The following table describes the four motivational goals and the associated process/structure of Ginsberg and Wlodkowski's (2009) CRT framework:

Table 1. Ginsberg and Wlodkowski's (2009) CRT framework.

Motivational Goal	Process/Structure
Establish inclusion	“The norms, procedures, and structures that are woven together to form a learning context in which all learners and teachers feel respected by and connected to one another” (Ginsberg and Wlodkowski, 2009, p. 27).
Develop attitude	“The norms, procedures, and structures that create through relevance and choice a favorable disposition among learners and teachers toward the learning experience or learning goal” (Ginsberg and Wlodkowski, 2009, p. 27).
Enhance meaning	“The norms, procedures, and structures that expand, refine, or increase the complexity of what is learned in a way that matters to learner, includes their values and purposes, and contributes to critical consciousness” (Ginsberg and Wlodkowski, 2009, p. 27).
Engender competence	“The norms, procedures, and structures that create an understanding for learners of how they are or how they can be effective in learning something of personal value” (Ginsberg and Wlodkowski, 2009, p. 28).

Data Collection

Participants, Location, and Recruitment

The population for this study was United States MLS and MLT educators at community colleges, technical colleges and universities. To obtain a sample of this population, I sent requests for participation electronically via email through the Clinical Laboratory Science Educator's Listserv. This Listserv contained members from across the United States. After I received interest from participants, interviews were conducted using telephone or Skype. Participation was voluntary. All required documentation and meeting arrangements were made via email.

Interviews

To meet Creswell's (2012) definition of collecting qualitative data through interviews, I asked participants general, open ended, semi-structured questions. The open-ended nature of the interview questions encouraged participants to "voice their experiences unconstrained by any perspectives of the research or past research findings" (Creswell, 2012, p. 218). I conducted 15 one-on-one interviews with individuals from varying race, gender, and institution, and laboratory types. Conducted interviews were recorded using Skype or other available video conferencing programs and lasted approximately 40 to 60 minutes.

Interview Protocol. Based on collected responses from the Listserv, I selected all willing participants. Once participants were identified, they were given consent forms to review, sign, and return. Arrangements for dates and times of interviews were made at

this time. Interviews were conducted on a one-on-one basis, utilizing the preferred method of the participant, with the following itinerary:

1. Introduction
2. Overview of the study
3. Verbal verification of consent
4. Interview questions
5. Participant questions
6. Closing statements

This outline served to structure each interview, however if participants had questions, they were encouraged to ask them at any time during our talk.

During the interviews, I asked participants open-ended questions in the hopes that they would fully describe and discuss their thoughts, opinions, and/or methods inside their classrooms. An example of the open-ended questions or prompts would include something like – *Describe what multicultural competence means to you.* These questions were designed to encourage educators to reflect upon their experiences, thereby helping me obtain saturation of data. Questions were grouped into the following categories: educational and personal background, perceptions of diversity, and philosophies of CRT (see Appendix A for a complete list of interview questions).

Participant Consent and Confidentiality

Participants completed a consent form prior to beginning their interview. On the consent form I indicated to participants that all data collected would be kept confidential and for anonymity, they would be able to select an alias. The confidentiality statement also indicated that interview would be recorded.

To maintain further confidentiality, data and associated files for this study are being maintained on a personal, password protected computer; all printed documents and a backup hard drives are being kept in a locked file cabinet at my home. Interview transcripts and consent forms are being maintained indefinitely; however, all research-associated files will be/were destroyed or deleted five years after the completion of this study. In addition to keeping access to files confidential, my academic research advisor and I will be/were the only individuals with access to identifiable data and associated documents.

Data Analysis

Thematic Analysis, Coding, and Analysis

Qualitative research typically generates large amounts of data, therefore I used several different techniques to assist in the analysis phase. Glesne (2011) suggests combining several strategies during data analysis to make sense of information and add depth to the inquiry. In this study, data was assessed using thematic analysis, coding, and analysis.

Transcription. After all the interviews were completed, a transcription of the audio recordings was created. The files were created using Microsoft Word. Each participant was assigned an alias. The completed document included the participant's alias, date and time of interview, length of interview, and the interview method – phone or Skype. Also, basic demographic information such as gender, years of experience, and type of educational program was included. Once transcription was completed, I began data analysis.

Thematic Analysis. Using an interpretivist paradigm, data was primarily analyzed using thematic analysis. This approach allowed me to “explore how categorizations of thematic ideas represented by the code vary from case to case, from setting to setting, or from incident to incident” (Gibbs, 2007, p. 48). It also aided in identifying and defining similarities and differences among interviewed MLS and MLT educators.

Coding. Coding techniques were utilized to define and organize the data. The interpretivist paradigm follows several rules when creating and using codes. These rules guided the coding process of this study (Glesne, 2011). After codes were established, I used them to identify patterns, define themes, and build understanding in the data.

Trustworthiness and Credibility

Construction of Meaning. Using an interpretivist paradigm, I constructed meaning from participants’ responses (Glesne, 2011). During the analysis of data, open coding was used to identify similar or related ideas. They were then reduced until seven codes or themes were identified. Similar codes and themes were identified from both within each case and throughout all cases. The identified themes were assessed by how they appeared in each participant’s responses, as well as how other participants addressed and described the same or very similar themes (Glesne, 2011).

Selection of Participants. The population of MLS and MLT educators was limited. This study sought to gain an accurate representation of the population. I emailed a request for participation to members of the Clinical Laboratory Science Educator Listserv. After the first request was sent, I identified eight willing participants. A second request was sent via the same method in an attempt to increase the number of willing

participants. Ultimately, fifteen willing individuals from varying schools, backgrounds, and program levels were identified and interviewed.

Triangulation. Triangulation, as defined by Creswell (2012), is the process of synthesizing information from multiple sources. This study utilized triangulation as a technique for proving evidence of validity. To achieve this goal, I utilized Ginsberg and Wlodkowski's (2009) CRT framework to analyze data collected from both MLS and MLT programs, which I then used to organize and validate various identified themes. In addition, I supplemented the CRT framework with additional literature and conducted an analysis of MLS and MLT textbooks.

Textbook Review. A review of various MLS and MLT textbooks was conducted. In the review process, I looked to identify references to diversity in textbooks related to the following MLS and MLT courses: Chemistry, Urinalysis, Hematology and Coagulation, Immunohematology, Microbiology, Phlebotomy, Education, Ethics, etc. I sought to identify references to diversity, if/how diversity affects laboratory testing and results, as well as direct discussion about diversity such as culture, race, gender, age, language, sexual orientation, and style. To identify textbooks for review, I looked to my own personal library and asked the participants to identify textbooks that have recently utilized. Analysis of at least two textbooks from each of the previously listed categories was completed.

Researcher Reflexivity. Researcher reflexivity is the awareness of oneself in the process of qualitative research (Bloor & Wood, 2006, p. 145). Because the researcher is closely involved in the process, qualitative research may include researcher biases and thoughts (Creswell, 2012). Therefore, it is important for a researcher to reflect on how

their identity may influence participants, setting, and procedures throughout the process (Glesne, 2011).

As an adjunct MLS educator and former program director for a MLT program in the Midwest of the United States, my background naturally played a role in data collection and analysis. I am an acting member of the small participant population with both professional and personal relationships with many members.

As an MLS and MLT educator, I have experienced many issues working with students from various backgrounds. Past experiences motivated me to study CRT in MLS and MLT education. For example, a discussion with a group of foreign refugee students about suspicions of cheating exposed different ways of thinking about and approaching education. With the knowledge gained from this one interaction, I was able to understand why cheating was occurring. I also learned how to approach the situation with more understanding and grace for future situations. I strongly believe that a better understanding of these different ways of thinking prior to teaching would have equipped me with tools for handling difficult situations in the classroom.

The field of laboratory science education is very small. Many of us know each other and are colleagues, friends, or acquaintances. I personally knew a few of the participants that completed interviews. The relationships I have with these participants may have affected my interpretations. As the researcher, I understand that my past, emotions, and own understanding of MLS and MLT education played a role in the construction of meaning in this study, however I worked to set aside my own unique past and uncover what CRT looks like in MLS and MLST education.

Summary

This qualitative study utilized an interpretivist paradigm to assess MLS and MLT educators' perceptions of an increasingly diverse student population. In addition, the analysis of the data collected identified how MLS and MLT educators developed their understanding of cultural diversity, prepared their students to communicate and work with culturally diverse patients, and defined and/or implemented culturally relevant pedagogy. This information was collected through interviews and analyzed for common themes using an interpretivist approach. The data collection process and analysis was conducted until saturation occurred. At the conclusion of this study, I obtained a better understanding of how MLS and MLT educators were addressing student diversity and preparing those students to work in a multicultural society.

CHAPTER 4

FINDINGS

The purpose of this study was to better understand MLS and MLT educators' perceptions of an increasingly diverse student population and investigate if and how they address the needs of this population. This was achieved by qualitatively assessing how MLS and MLT educators perceive the changing environment of medical laboratory science/technician education in community/technical colleges and universities. I sought to define and describe the current teaching methods that laboratory science educators use address the needs of diverse student populations and prepare them for working in a field that requires communicating with culturally diverse patients. Seven significant themes were identified through analysis of the collected data.

Overview of Participants

A total of 15 MLS or MLT educators participated in this study. The participants ranged in experience from two years to over twenty years. A total of thirteen female participants and two male participants were included in this study. One participant was from a different country and was trained in their home country and the United States in Medical Laboratory Science.

Table 2. Participant overview, assigned alias gender, and program type.

Participant	Gender	Program Type
Lisa	Female	MLS
Roland	Male	MLS

Table 2. cont.

Participant	Gender	Program Type
Kristie	Female	MLS
Heather	Female	MLT
Karla	Female	MLS
LeAnne	Female	MLS
James	Male	MLS
Melanie	Female	MLS
Ashlee	Female	MLT
Tracy	Female	MLT
Elizabeth	Female	MLS
Lindsey	Female	MLT
Abby	Female	MLS
Stephanie	Female	MLS
Andrea	Female	MLS

Overview of Themes

A total of seven themes were identified. The first theme was, increasing diversity in MLS and MLT programs, which reflects the increasing diversity of student populations and the growing need to understand and address diversity in laboratory science programs. The second theme addressed the importance of promoting strong written and oral communication skills and the need to encourage inter-professional communication. The third theme described how instructors incorporate diversity into course activities, materials, and textbooks. The fourth theme highlighted the importance of positive relationships between faculty and students and stressed the importance of an effective learning community. In addition, theme four and its sub-theme outline the ways educators encourage relationships and learning communities. The fifth, sixth, and seventh themes included promoting a favorable attitude towards learning, understanding the importance of curriculum, and verifying competence. Collectively, these themes describe the need to address diversity and promote strong communication skills in laboratory science programs.

There is a need for additional resources related to educational activities MLS and MLT faculty use to address diversity in the classroom and promote multicultural competence.

Theme I: Increasing Diversity

The first theme that emerged from the data was the perceived increase in the amount and types of diversity in MLS and MLT programs. All participants indicated that their programs and classrooms have well represented diversity. For example, Melanie stated, “We have seen increased diversity in two categories last year. We have seen an increase in male students. We have also seen an increase in racial diversity.” Ashlee described her current classroom and stated, “I actually have a very diverse classroom right now.” Karla and Elizabeth stated, “my classroom is pretty diverse” and “we are hugely diverse,” respectively. After all participants indicated that they felt their classrooms or programs reflected diversity, the participants described various types of diversity. Tracy noted a wide range of diversity in her classroom; she stated, “Our diversity runs the gamut from ethnicity to age to sex.” Karla listed the types of diversity in her classroom as, “diversity in background,” “diversity in socioeconomic status,” and “diversity in culture.”

Types of Diversity.

All participants noted an increase in ethnic diversity. However, several participants (i.e., LeAnne, Melanie, Ashlee, and Heather), specifically mentioned an increase in gender diversity. Melanie stated, “We are seeing more males in the MLS program.” Melanie and Ashlee described that, historically, MLS and MLT programs were female-dominated programs. Ashlee reflected on the time when she was a student; she stated, “When I went to school, there were ten of us and we were all white females.”

Heather also discussed an increase in gender diversity in her classroom. She stated that “some years, some courses, I have had no male students.” Then she described that, in her experience, the lack of male input added an interesting dynamic to courses. Heather concluded that the increase in gender diversity has been a “good thing.”

The majority of participants noted socioeconomic status and financial diversity. Andrea and Abby indicated that they recently noted this category of diversity in their programs/classrooms. Lindsey mentioned, “I’ve had a whole lot of single moms in the group. That’s a diverse group.” Participants also described the challenges this can pose for students. Statements, like “they struggle to purchase textbooks,” were common when participants discussed students from lower socioeconomic.

An additional category of diversity was education experience. Participants indicated that students have various types and levels of prior of educational experience before entering the MLS or MLT program. Karla found that students with poor previous learning experiences had a more difficult time learning than those with a stronger education in high school or community college. Karla could predict what school district certain students came from because they tended to struggle more and often fell behind the other students. However, LeAnne noted that her MLS program recently admitted a student with a doctorate. She described that the student was a doctor in his native country and needed to start over when moving to the United States. Stephanie also described having a foreign physician in her program who she utilized as a resource and catalyst for further discussion in her classroom. She shared, “I had an Iraqi doctor and I am like, ‘So, what would you have done at home if you have this type of patient?’”

Language diversity also increased in MLS and MLT programs. All participants listed language diversity as a category of diversity within their programs/classrooms. For example, James indicated that he had “several English Language Learners” (ELL) in his classroom. Tracy described that language diversity has positive and negative influences on learning. Students with language barriers often fall behind in her courses. Tracy also noted that these students require extra time and additional resources to be successful in her courses. In contrast, Tracy also described ways in which bilingual students contribute to the classroom; “they often will serve as a resource to other students and are highly sought after in the workforce.” She also stated that her, “students in the cities often times need to be bilingual.” However, the majority of participants described students with poor English language skills struggling and needing additional resources to keep up with the pace of the program and be successful. Lisa described this when she said that students with language barriers, “struggle with medical terminology.” She stated that she would often have to “repeat meanings of statements I make” and help correct misinterpretations. Ashlee described students whose first language is not English, stating “they understand the material,” however, their “biggest issue is probably with reading assignments because they’re not very good at writing English.”

Another area of diversity that participants described as requiring additional preparation and work is learning disability. Stephanie described that she recently encountered deaf and colorblind students. She noted that it is “interesting how people compensate,” but asserted, “they bring another dimension to what would have been your normal preparation of your course.” Tracy stated that, “When a student has a learning disability that’s not identified up front, has been the time that I’ve seen them struggle the

most” and “has been the toughest to deal with.” Tracy noted that it is best to identify students’ specific learning needs at the beginning of a course. This enables the students to obtain access to assistance right away and avoid struggling during the course.

Participants also noted diversity in other areas: sexual orientation, social skills, and future goals. Lindsey noted that there was more “sexual orientation diversity.” Kristie observed that “there’s a lot of other diversity related to interpersonal relationships” in her classroom. Kristie noted social skills diversity and stated that “I find great diversity in the willingness of students to participate in a discussion in class, even bordering on antisocial behavior in some of them.” Kristie addressed “diversity in future goals.” She stated, “I have students that plan on working in the clinical laboratory then I have students that are pre-med.”

Reason for Increased Diversity

Some participants speculated as to the reason for the increasing diversity within their programs/classrooms. Elizabeth asserted that the rigorous requirements to enter the nursing program at her institution contribute to the increasing diversity in her MLS program and other allied health science programs. Regarding students in the nursing program, she stated, “I’ll bet you they’re 90% white” and “I’ll bet you they’re 90% female.” She also indicated that the admission requirements were “very, very grade driven.” Her perception was that students who did not meet the minimum requirements for the nursing program moved to other allied health science programs, like her MLS program, which contributed to the increased diversity in her MLS program. In contrast, Roland noted that the increase in diversity within his MLS program was “occurring naturally” and that their program was not working to increase diversity by using selection

methods during the admission process. He stated, “Most groups [of diversity] are fairly well represented without extra effort.”

Several participants were unsure how their program’s percentage of diversity compared to other MLS or MLT programs. All participants indicated that they felt their programs/classrooms were diverse and that they recently noticed an increase in diversity. The study participants indicated positive and negative effects of increasing levels of diversity within their programs/classrooms. It is critical to acknowledge the effects of diversity in MLS and MLT programs, classrooms, and in clinical internships during which students encounter a diverse workforce and patient population. The participants highlighted the need for improved communication skills, most of all.

Theme II: Promoting written and oral communication skills

“It’s all about good communication,” stated Karla. Regarding communication, Karla stated, “It is such a big component of education and management.” Karla focused on the barriers to communication and how to overcome those barriers. She emphasized the importance of achieving communicative competence and stated that she “makes sure there is understanding on both sides.” She also stated that it is important to “make communication a two-way street” and she emphasized the importance of this in her management course.

The second theme that emerged from the data was the importance of communication skills. Many participants described weak communication skills among their MLS and MLT students. This was a common issue for English Language Learner (ELL) or English as a Second Language (ESL) students and with a weak academic background, typically due to low socioeconomic status. Tracy noted that, “We found that

when English isn't the primary language for a student in health sciences, we have to try and intervene somewhat with that language barrier because our clinical sites won't hire them or even let them intern if their English is not good." Elizabeth also stated, "Our attrition rate is quite bad with English second language people." She described the difficult nature of language in MLS and MLT education. Elizabeth stated, "I think medicine has its own special vocabulary that trips everybody up." All participants described this as a challenge in the classroom that requires additional work to bring students up to the minimum expectations to be successful in the course and/or program.

During the interviews, participants described how they help students overcome struggles with communication. Participants commonly utilized college-wide resources to promote stronger written communication skills. For example, to assist students with language issues, Roland stated, "We have an internal referral we can make because we have speech language pathology people here in our school and they do have a program for ESL/ELL students." Other college resources included programs to help troubleshoot student issues, tutors for basic sciences, study skills, and time management.

It is common practice to use recorded lectures in online courses, and one participant described recording lectures for students to re-listen to as needed. Kristie reported that, "I started recording my lectures in the classroom using Adobe Presenter the first time around." She started to use this method because it was common for students to say, "I wanted to sit and listen to what you are saying. I do not want to have to take notes at the same time. It distracts me and I do not want to miss anything." Kristie's students would also say, "Can you put the recordings on the course management site so I can listen to them again and take careful notes?" She reported that it was because of these

student requests that she began using the “flipped course” method. She stated, “I was forced to go with the all flipped model, or the don’t record model.” She also stated, “I really prefer the groups, the flipped learning, the collaborative learning, and the discussion of learning objectives in class.” Kristie found this method to be helpful to all students; the recorded lectures provided additional learning opportunities.

Many participants indicated that they used college resources to promote strong written communication skills. One participant, however, noted that these resources were lacking. Melanie described her struggle with an ELL student; “We reached out to the college for resources...we found there wasn’t anything here.” All participants agreed that oral and written communication skills are important and that there is a need to utilize additional resources at the institutional level for oral and written communication support.

The second theme, promoting written and oral communication skills, was the most important skill to promote in MLS and MLT other than laboratory testing skills and theoretical knowledge. MLS and MLT professionals need to be able to communicate with their diverse colleagues and patients when they enter the workforce. All participants agreed that strong written and oral communication skills are essential for students to be successful in academia, during clinical internships, and when they enter the workplace. Communication skills are a critical component of the MLS and MLT curriculum.

Theme III: Addressing diversity in MLS and MLT courses

The third theme that emerged from the data was ways in which instructors address diversity in MLS and MLT courses. This theme describes how educators approach the topic of diversity in their classroom. To supplement their responses, a review of laboratory science textbooks content was conducted. The synthesized data from the

participant interviews and the textbook review are divided into two main categories: hard science and professional development courses. The hard science category includes hematology, immunohematology, immunology, chemistry and urinalysis, and microbiology. The professional development course category includes various subjects, such as phlebotomy.

Hard Science Courses

Hard science textbooks contained indirect examples of diversity, such as examples of ways diversity may affect laboratory test results. The textbooks commonly described changes in reference ranges or disease risk due to age, gender, and/or race. Hard science course textbooks also noted differences in susceptibility to certain diseases based on life style and geographic location.

Hematology. Hematology textbooks referenced diversity of age, gender, and race. They included details regarding reference range variations for hematological tests. Reference ranges for hemoglobin, hematocrit, red blood cell count, mean cell volume (MCV), and mean corpuscular hemoglobin (MCH) vary with age and gender (Ciesla, 2011; McKenzie & Williams, 2015). McKenzie and Williams (2015) reported that the hemoglobin reference range for an adult male is 14.0 - 17.4 g/dL, an adult female is 12.0 - 16.0 g/dL, and a two-week-old newborn is 13.0 – 20.0 g/dL.

Additional examples of reference ranges variations are serum iron levels related to age and sex. The normal reference range for serum iron in a child less than one month old is 60-200 mcg/dL, an adult male is 65-180mcg/dL, and an adult female is a bit lower at 50-180mcg/dL (Ciesla, 2011). Serum ferritin values also vary by age and sex; the normal reference range for a newborn is slightly lower than adults. In addition, the

reference range for adult females is wider than adult males (Ciesla, 2011; McKenzie & Williams, 2015). Discussions of diversity in hematology textbooks appeared only in reference to ranges.

Immunohematology. Most immunohematology textbooks included references to age, race, and ethnicity as they relate to antigens found on erythrocytes. For example, Lindsey stated, “In blood bank, we talk about diversity a lot with just red cell antigens. I discuss the importance of getting donors from among all races versus just mostly Caucasian donors.” In her blood bank course, Tracy requires students to write a paper about diversity. She stated, “In blood bank, we have them write about different antibodies so that they can relate it to ethnicity.” Tracy emphasized the need to recruit additional blood donors from all races to help meet typing and cross-matching needs. The participants’ examples aligned with the findings from the textbook review.

Immunohematology textbooks commonly referenced different blood group antigens that are specific to certain races/ethnicities. For example, Blaney and Howard (2009) stated, “Antigen frequencies vary by race” (p. 64). The authors noted, “when calculating antigen frequencies in a population the predominant race needs to be taken into consideration” (Blaney & Howard, 2009, p. 64). “Bombay phenotypes have been reported with a relatively greater incidence in India” (Blaney & Howard, 2009, p. 101). Blaney and Howard (2009) also noted the variation of blood groups by race. For example, “group O and group A individuals constitute 45% and 40% of the white population, respectively” (p. 81). In contrast, the “B phenotype has a higher frequency in black and Asian populations than the white population” (Blaney & Howard, 2009, p. 81). The occurrence of the U antigen is very common, but Blaney and Howard (2009) noted

that, “U-negative cells are found only in the black population” (p. 147). “U-negative blood can be found in less than 1% of the black population” (Blaney & Howard, 2009, p. 149). There is also variation of phenotype frequencies between blacks and whites among the M, N, S, s, and U red blood cell antigens (Blaney & Howard, 2009; Harmening, 2012). The Duffy antigen system also shows differences according to race. Harmening (2012) noted that the most common phenotype among the white population is Fy(a+b+), the most common phenotype among the black population is Fy(a-b-), and the first anti-Fy3 antibody was from a white Australian woman. Blaney and Howard (2009) noted that “the K, Kp^a, and KEL17 alleles are more common in the white population, whereas the Js^a allele is more common in the black population” (p. 128). The Lewis blood group systems also show different frequencies based on race.

Age was another category of diversity in blood banking textbooks. To describe how age affects blood groups, Blaney and Howard (2009) noted that newborn and fetal cells have less antigens on the surface of their red blood cells than adults. Newborn and fetal cells do not have fully developed antigens; therefore, performing a blood type on these patients may result in weak reactions that make determination of their blood type difficult (Blaney & Howard, 2009; Harmening, 2012). The Duffy antigen group also relates age. Unlike the blood group antigens, Duffy antigens are well developed at birth and easily detectable on newborn red blood cells (Blaney & Howard, 2009; Harmening, 2012).

Immunology. Immunology textbooks included references to race/ethnicity, gender, and age. For example, Rittenhouse-Olson and De Nardin (2013) reported, “The incidence of Systemic Lupus Erythematosus is 10-fold higher among women than men,

and is more prevalent in persons of non-European lineage, African American, and Hispanics” (p. 157). Age and gender predispose individuals to rheumatoid arthritis. Rittenhouse-Olson and De Nardin (2013) reported that rheumatoid arthritis is more common in 40 to 50-year-old individuals and is three times more likely to occur in women. Organ and tissue-specific autoimmune disease risk also varies by gender. Rittenhouse-Olson and De Nardin (2013) and Stevens (2003) described that the female to male prevalence for Grave’s disease, multiple sclerosis, glomerulonephritis, and Addison’s disease are 88:12, 63:37, 33:67, and 93:7, respectively. In agreement with the textbook findings, Kristie stated, “The only time that I address diversity in my science courses is when I talk about susceptibility to autoimmune disease and things like that.”

Additional examples in the textbooks included that individuals with Down syndrome are at higher risk of developing celiac disease (Stevens, 2003) and that primary biliary cirrhosis is more common in “Caucasian women between the ages of 35 to 70” (Rittenhouse-Olson & De Nardin, 2013, p. 184). “Goodpasture’s syndrome is more common among young men” (Rittenhouse-Olson & De Nardin, 2013, p. 190). Other diversity references included that primary immunodeficiencies are more common among males and that selective IgA deficiency has a higher prevalence in individuals from the Arabian Peninsula and is more common in males (Stevens, 2003). Hereditary angioedema occurs more frequently in individuals in the United States (Rittenhouse-Olson & De Nardin, 2013).

Chemistry and urinalysis. Chemistry and urinalysis textbooks referenced diversity least, but some chemistry textbooks included chapters about phlebotomy. For example, within the phlebotomy chapter, Bishop, Fody, and Schoeff (2010) discussed

techniques to consider when performing phlebotomy on a child. They discussed interacting with a child, immobilizing a child, and pediatric equipment. The authors also discuss things to consider when performing venipuncture on geriatric patients (Bishop, Fody, & Schoeff, 2010). In addition to phlebotomy chapters, there were a few diversity references in relation to anatomy, disease risk, and normal result ranges.

Bishop, Fody, & Schoeff (2010) explained that a woman's ethnic origin is an important consideration when evaluating a patient for hirsutism. It is helpful to know if a woman is of Italian, Eastern European, East Indian, or Irish decent, because these populations possess more androgen-sensitive terminal hair than most northern European women (Bishop, Fody, & Schoeff, 2010). "Women are five times more likely than men to develop [grave's disease]" (Bishop, Fody, & Schoeff, 2010, p. 497). Chemistry textbooks also noted that Bilirubin reference ranges vary by age. Premature infants have a reference range of 10-12 mg/dL, and a full-term infant's reference range is 4-6 mg/dl (Bishop, Fody, & Schoeff, 2010). This variation in reference range is directly related to the development of the liver. Urinalysis textbooks included very few references to diversity. Strasinger and Di Lorenzo (2008) reported that, "Hunter Syndrome is inherited sex-linked recessive and is rarely seen in females" (p. 169).

Only one participant mentioned chemistry/urinalysis during their interview. She indicated that she does not directly talk about diversity. Andrea stated,

"I must admit that when I teach, I am teaching more to the content of clinical chemistry. I bring in, for example, differences in reference ranges or different cultures. I definitely include those but I don't make it a part of my course work."

She also added, “I’m not sure that I know anyone that does.” The lack of participant description of diversity content in chemistry courses correlates with the difficulty in finding diversity references in chemistry textbooks.

Microbiology. Textbooks designed for MLS and MLT microbiology courses referenced lifestyle diversity and ethnic origins. For example, life style choices such as intravenous drug use and homosexuality increase risk for certain diseases like Human Immunodeficiency Virus (HIV) and Hepatitis C Virus (HCV) (Kiser, Payne, & Taff, 2011; Tille, 2014). Microbiology textbooks referenced ethnic origins related to certain diseases in specific geographical areas. For example, individuals living in tropical regions of African or that travel to certain areas of Africa have a higher risk of contracting malaria because it is a parasite endemic to those areas (Kiser, Payne, & Taff, 2011; Tille, 2014).

The hard science textbooks that teachers use in laboratory science education address diversity as it relates to disease risk, laboratory testing, and results. The most common diversity references were age, gender, race, ethnicity, geographical location and lifestyle choices. However, the participants of this study emphasized the need to focus on communication when addressing diversity. The hard science textbooks addressed important aspects of diversity and how it affects laboratory testing, but failed to include discussions about diversity related to communication, patient care, and healthcare equality. When describing courses that address diversity, participants often pointed to professional development courses that contained more formal discussion of diversity. For example, Kristie stated, “We have diversity stuff in our education and management course” and LeAnne stated, “We talk about it the management course which is taught by

our administrative director.” Participants identified additional courses related to diversity. Abby mentioned ethics classes, James mentioned special topics courses, and Lisa mentioned phlebotomy courses.

Professional development courses

The number of textbooks with references to diversity was significantly smaller within this category. However, professional development textbooks included more direct examples of diversity. This section will discuss the professional development course category, phlebotomy, special topics, capstone, education, management, and ethics courses.

Phlebotomy. Phlebotomy textbooks often included topics such as diversity and multiculturalism. It is important to include a discussion of diversity when teaching phlebotomy because this is the area in which laboratory professionals directly work with patients. Age was the most common facets of diversity in phlebotomy courses. In her phlebotomy course, Tracy required her students to “do a presentation on age diversity where they can discuss how to work with a toddler and the toddler’s parent.” Tracy added,

“We give them different scenarios and they have to be able to do a presentation to the rest of the class about how they would approach the situation and the appropriate actions that they need to take to be able to be successful and get the blood.”

Melanie reported that, “in phlebotomy, we cover age.” She provided an example about skin tone. She stated, “We do cover difficulties where you could have somebody who has darker skin and how you would address and approach that because it can be

more difficult to draw them.” Weight and age can make it difficult to visualize a vein. Fragile skin, often a problem for older individuals, can make drawing blood difficult. When the elasticity of the skin is weak, a medical professional may need to alter their technique by pulling and holding the skin more securely prior to the venipuncture (Booth & Mundt, 2013).

Lindsey discussed issues of diversity in her phlebotomy and basic lab skills courses. She stated, “We talk about issues with drawing blood or collecting urine. We always talk about when you are giving instructions on how to collect a 24-hour urine sample. People have different languages. You may have disability barriers. Things like that.” She indicated ways to locate resources for help, when needed. Lindsey noted that providing picture directions is often helpful in overcoming communication barriers.

One participant, a former educator and author of MLS and MLT textbooks, described dedicating a chapter to diversity in a phlebotomy textbook. The content of the textbook described diversity that professionals may encounter in the workforce. Booth and Mundt (2013) wrote a textbook, *Phlebotomy: A Competency-Based Approach*. It includes a chapter dedicated to professionalism with a section addressing diversity. The book includes an objective and NAACLS competency directly related to diversity, “summarize healthcare diversity and competent professional communications” and “demonstrate respect for diversity in the workplace” (Booth & Mundt, 2013, p. 359). The authors defined diversity as “a term used to encompass variations of a category, such as the various types of life found on earth, the various ways one can invest money, and the various cultures that are displayed by human beings” (Booth & Mundt, 2013, p. 361). Interestingly, the section on diversity strongly emphasized communication that aligns

with the assertions of the study participants from theme two. The chapter contained topics related to communicating with patients and family members. The authors also included a summary of various cultural perspectives to help promote a multicultural understanding. In addition, Booth and Mundt (2013) discussed communicating with other members of the healthcare team.

Other related textbooks. Veatch and Flack's (1997) book, *Case Studies in Allied Health Sciences*, contained a case study that directly addressed diversity. The authors described an orthodox Jewish woman who struggles while participating in laboratory testing of women having abortions. The case study outlined her struggles to do what she considered morally right while still performing the required duties of the job. The case study prompted discussion of how the reader would handle a similar situation. The book contained 81 case studies. This particular case study was the only one that directly noted religious views; however, religious values influence how people viewed situations in many other cases.

Pozgar's (2013) book, *Legal and Ethical Issues for Health Professionals*, contains a section specifically dedicated to ethics, tolerance, and religious beliefs in healthcare. Pozgar (2013) asserted, "There is a need to know, for example, how to respond to Jehovah's Witnesses who refuse blood transfusions" (p. 45). Pozgar (2013) discussed religious beliefs among several religious groups to help the reader "understand how religious ethics can affect one's moral character" (p. 1). Ethical dilemmas in healthcare includes topics such as abortion, artificial insemination, organ donation, research, and experimentation (Pozgar, 2013). Pozgar's (2013) discussed how all of these topics can seem very different, depending on the researcher.

One participant, James, teaches a MLS capstone and a special topic course. He provided several examples of ways he incorporated diversity into his courses. In the capstone course, James' students watch a video about Mary Mallon - Typhoid Mary. The students discuss the plight of Mary, a refugee, through the discussion board. This activity combines a discussion of diversity with the public health concerns associated with preparing food when infected or carrying Salmonella serotype Typhi. James' students also read a publication from Georgetown University related to cultural competence that address the efficacy of cultural and linguistic competency on healthcare outcomes. The students then discuss the article on the discussion board.

In summary, there are many different methods for addressing diversity within the MLS and MLT program curriculum. Instructors can incorporate diversity in hard science and professional development courses. Most participants agreed that it is difficult to incorporate diversity in the MLS and MLT curriculum due to a perceived time constraint but that it is important to take the time to address diversity when possible. The types of diversity discussed in MLS and MLT education consist of topics related to age, gender, race, geographical location, and life style choices as they affect laboratory testing and test results. All textbooks in the textbook review referenced diversity; the textbooks for the hard sciences included more indirect references. Professional development course textbooks included a few discussions of diversity. The minimal amount of diversity discussion in hard science textbooks aligns with the participants' requests for additional resources to incorporate diversity into their courses.

Theme IV: Encouraging learning communities

The importance of encouraging learning communities among students was the fourth theme that emerged from the data. Palloff and Pratt (1999) defined learning communities as “the relationships and interactions among people through which knowledge is primarily generated” (p. 15). All participants agreed that learning communities play an important role in education and felt strongly that it was the instructor’s role to encourage participation in those activities. Promotion of learning communities is one of the critical components of Ginsberg and Wlodkowski’s (2009) framework for delivering culturally relevant pedagogy. Each learning community is unique. The participants described a range of online communities, study groups, and social events. The participants noted that these learning communities look different from year to year.

The participants of the study repeatedly described CLS or MLS clubs at their institutions. For example, Abby shared, “We have a CLS club. We are constantly encouraging them to be involved. Anything that we hear about that we think would be great for student involvement.” The clubs are usually student driven to promote study groups and interaction between to students. Some of the participants described designated areas for their students to come together, study, and socialize. LeAnne stated, “Some of the students do sometimes study together. I know that they ask each other questions. They have times, usually in the afternoons, that they are in there and they have their own breakroom. They are usually in there before class state and they are discussing different assignments and their exams and their study notes.”

Elizabeth also described a designated area for her students. She stated, “We have a resource room here at the department where they congregate. There are computers. There are textbooks. There is a study area in the middle. They tend to cluster a lot in their cohort.”

Lindsey described an English-speaking club on her campus. She promoted this club to her students who struggle with the English language. Lindsey stated,

“It is for English Language Learners, and they get together once per week for an hour, an hour and a half, and they speak English with each other. It is their chance to really mess up and it is their chance to realize that, ‘Hey, we all in this together’ and lots of times they can get some help, just peer support.”

Participants expressed ways they encouraged students to form and actively participate in a learning community. For example, Abby stated,

“It is in our core values. We create a sense of community amongst our students and colleagues. We all have an open-door policy so we encourage our students to stop by as frequently as they need to. In those moments, we are also like, ‘Hey, why are you doing this? Or, hey, why don’t I see you participating in that?’”

Group work was another method that participants utilized to encourage participation in the learning community. Heather stated,

“We have them pair up, and I will have them randomly pair up. They tend to pair up with their friends, and many times the foreign students will pair together. What is always seems to be is, it doesn’t matter if they are foreign or not, that two weakest students tend to pair together. So, I am always randomly assigned people as pairs just to keep the mix going.”

Kristie provided an additional example; she stated,

“I ask them if they have friends in the course. Then, I deliberately put them in different groups. You have to do that. You cannot have two friends in a group and expect them to communicate with the others. They won’t.”

Lisa described frequent group activities. She paired students with other students who have a different background. She stated, “We always had class activities where they would have to interact in a group setting and not just pair off with somebody else of their own culture.” These activities were very helpful to ESL and ELL students. Lisa noted, “They really don’t hesitate to try to get help from their more English speaking classmates and the classmates were very, very willing to help. There was not a competitive spirit at all. It was more everybody helped each other.” Stephanie also utilized group activities to encourage learning. She stated, “I have always liked to pair them with others because it is going to make the strong students stronger and it is going to foster improvement in the weaker student.”

Some students participate less than other students. Elizabeth described students who did not participate in the learning community due to religious views. She shared,

“We had a Hispanic student that was a Jehovah’s Witness. We had the year before a black student who was also a Jehovah’s Witness. I would say those two really stand out in my mind as not participating but I think that is their religious kind of apartness. I think that they, because of their religion, are a little bit apart.”

Kristie discussed struggling to get diverse students involved in learning communities.

She stated,

“It is really hard. It is really hard to get them out of their comfort zone and to think about addressing daily schedules and their priorities differently than what they have become familiar with. I think some students embrace change very well, and those are the ones that are going to be the most successful. Those who try to stay with the status quo and what’s comfortable and always “worked for me” are the ones that are going to struggle.”

Online programs have virtual learning communities. James described that online learning can make formation of a learning community more difficult. However, he breaks his online courses into groups and assigns a facilitator. James stated, “Course facilitators help us make more of a connection with our students when we have a large online course.” Online tools promote a learning community for distance students, specifically, students that commute. Tracy described her students’ difficulties related to participation in a learning community because many of them commute to campus. She stated, “We try to make it user friendly. If you can extend it to their world, so to speak, or their timeline a little better, then you can see more participation.” Tracy explained that she tries to make activities at various times to help compensate for students who work odd hours. She stated, “I try to make it something they can participate in the wee hours of the morning if they are working night shift.”

All participants described learning communities within their MLS and MLT programs and other institution-wide learning communities. All participants agreed that it is important to encourage student engagement in the learning communities and promote communication among students. Learning communities help students engage in cross-cultural communication as they work with students from diverse backgrounds. These

learning communities also help provide the platform to promote inclusion. The described MLS and MLT learning communities provide a platform for students to make connections, develop a sense of belonging, and experience a sense of inclusion. To encourage communication and participation, participants assign group work, promote MLS and MLT clubs, and provide a physical or online environment for students to meet, social, and study. Within the fourth theme, participants also expressed the underlying need for positive relationships in successful learning community, which required the creation of the sub-theme: fostering positive relationships.

Theme IVa: Fostering positive relationships

This sub-theme reflects the importance of positive relationships in MLS and MLT learning communities. Ginsberg and Wlodkowski (2009) asserted that faculty-student relationships and student-student relationships are critical components to motivation and the learning process. In agreement with this, all the participants of this study encouraged positive relationships with their students and positive relationships among students.

Faculty-Student Relationships

All participants expressed the importance of promoting positive relationships with their students. For example, Abby stated that promoting positive relationships with her students “is the number one reason why we are here.” Elizabeth stated that her goal is to get students to feel comfortable with her.

Lindsey worked with students during their first semester in the program, which helped her form relationships. She stated, “it is really important for me. I have them their first semester. So, they imprint on me like little ducklings.” She added, “I think it is really important to have that relationship because you develop trust.” Lindsey also described the

long-term benefits of having a positive relationship with students. She reported that, “I have students that were my students years ago that I stay in contact with. They bring me expired supplies or reagents. They are constantly updating me.” In addition, she stated that she is “constantly learning from them.”

Heather described helping a student get to and from courses when having difficulty paying for gas to drive herself to the school. Heather also worked closely with her adjunct instructors to identify students who are struggling. She reached out to those students by holding meetings with them to identify and find solutions to their barriers. Ashlee agreed that a positive relationship with her students is important; however, she emphasized the need to have boundaries. Ashlee stated, “It is important but with boundaries. I need to make it clear that I am very available to them.” She added, “They try to friend me on Facebook. I do not accept their friend requests. I think it is important for them to trust me, but in a professional way.”

Other examples of promoting positive relationships with students include an open-door policy that LeAnne and Karla use to encourage students to stop in and meet with them. In addition, LeAnne schedules short meetings to allow students to voice their opinions and to get to know the students. Kristie reported that she tries to show that she has a life outside of being a teacher by sharing personal information with the students. At the beginning of a class, she shares a photo of her family. She tries to be approachable. Roland, who is from a private Christian institution, described how presence and exposure help faculty appear approachable. He used the example of weekly chapel as an opportunity to interact with students outside of the classroom. In addition, he said physical structure helps with exposure; the laboratory, classroom, and faculty offices are all very close together.

James described difficulties associated with promoting relationships with his students in online environments. To overcome the challenges of distance, James asked adjunct faculty facilitators to hold office hours online using a synchronous chat that has typing, audio, and video capabilities. This technology enabled students to interact with faculty and ask questions as needed. Tracy, a director of multiple programs, noted the difficulty of reaching all students when distance is a factor. She stated that because she does not teach very often, she struggles to maintain relationships with her students. Tracy tries to make sure that students are comfortable enough to approach her. She often monitors online courses and provides positive feedback to students, or intervenes when a student shows signs of struggling. Tracy, reported, “I monitor grades every week. I probably know their grades better than their course instructor. I know early on who is struggling and then I have a one-on-one call with each of my coordinators every week.” She takes the time to meet with each program’s students at least quarterly. In addition, she utilizes online programs for audio and visual interaction with the students. She recently held a review session with the students to prepare them for their Board of Certification examination.

Participants described the importance of relating to students on a humanistic level. Kristie asserted, “Students have to know that we are human. I certainly think I would [have] addressed some of my classes differently had I thought my professors were more approachable.” Abby agreed and stated, “They have real life going on and I want them to know that I am a real person. I am totally understanding and empathetic to what may be going on in their lives.” It is through these positive faculty-student relationships that educators can reach common ground with their students to help them grow and learn.

Melanie felt strongly that good relationships with her students are important but she also felt that she does not form close relationship with her students. Melanie stated,

“At times, I lament the fact that I do not have close relationships with my students. I have tried to figure out why. But, I guess I don’t ever build up real close relationships like, I do not think I ever have.”

However, she described that students comment on evaluations that they feel closer to the program’s faculty members than to other faculty at the institution. She stated, “Students often say they have more contact with faculty within our program than they have with anyone else throughout their college career.”

The participants of this study agreed with Ginsberg and Wlodkowski’s (2009) CRT framework. They all agreed that it is important to have positive relationships with their students. To accomplish this, most of the participants actively worked to cultivate these relationships. They understand the critical role relationships play in the learning process.

Student-student relationship

All participants described the importance of positive relationships among the students in their classrooms. The most common methods for promoting these types of relationships were through laboratory practice, assigning group work, and promoting learning communities.

Lindsey described the benefits of group learning and forming strong relationships with classmates. She stated that she promotes this by encouraging group work and study groups. She explained that it is best to mix up the participants in those groups. Andrea explained the importance of study groups; students who do not study with others often approach her with questions. When approached, she helps them identify a study partner in

addition to answering their question. Andrea described that her program used to have a mentoring program between students. She stated that it was common for senior students to mentor junior students, and then those junior students would move into the mentor role when they became seniors.

Kristie held high expectations for interactions among students. For example, she shared a story about a student who was not communicating well with others and was planning to attend medical school after graduating. She pulled the student aside and emphasized the importance of professional communication, especially in the workforce or medical school. Elizabeth stated, "I think it is incumbent upon us to make them be able to relate to all sorts of people, and that includes each other." Abby also promoted student relationships. She promoted learning communities by encouraging participation in team building activities, clubs, and school parties. Karla stated that she assists students in forming study groups. Many participants described the importance of the MLS and MLT clubs and relationships between students. To promote these activities, Ashlee will "make announcements in [her] classroom and [posted] announcements on blackboard."

The laboratory was a common place participants used to promote student relationships. For example, Ashlee stated that she utilizes the laboratory to encourage interactions between students. Ashlee felt that her role is to mediate the relationships. She felt it was important for her to "discourage inappropriate behavior like bullying." Stephanie discussed promoting relationships in the laboratory by having students learn to perform venipunctures on each other. This activity encourages students to bond. Elizabeth also encouraged students to relate to each other, typically within the laboratory setting. She

stated that these relationships are “important because we need to teach students to relate to others.” Elizabeth added,

“We need to divorce previous relationships and move everybody around in the lab. Partly because they become co-dependent but I also think it forces them into making their own relationships and learning how to relate to people that are different from them and not just their best buds.”

James described student relationships in online environments. To overcome the challenges of distance, James assigned group work that requires students to meet synchronously and asynchronously. However, he indicated that students across multiple time zones struggle to meet, especially because the majority of students in his distance program work as MLTs. James tries to put the students in groups related to their time zones.

Positive relationships are critical to the learning process and creating a sense of inclusion. A sense of inclusion and relating to faculty and other students is one of the major components of Ginsberg and Wlodkowski’s (2009) CRT framework. In agreement with their educational goals, the participants emphasized the importance of positive relationships with their students and between students. Promoting these relationships was a vital component of the classroom and program. These relationships help form learning communities that promote positive student learning outcomes. Again, these positive relationships allow students to interact with student who are different from themselves. These interactions promote cross-cultural communication and an understanding of how and why diversity affects their everyday life and prepares them to work in a diverse society and with diverse patients.

Theme V: Promoting a positive attitude

The fifth theme is, promoting a positive attitude. Participants expressed overarching beliefs that a positive attitude is key to the learning process. This theme aligns with Ginsberg and Wlodkowski's (2009) CRT framework and highlights the importance of motivation in education. The participants of this study all agreed that a positive attitude is important. LeAnne stated, "I think that's very important. If they are much more positive, they seem happier if they enjoy their learning experience." Andrea asserted, "The stuff you are learning ain't junk and it ain't extra. This is the meat of what is going to be your passion for the rest of your career." Heather agreed and stated, "It is important because, if they think of it as drudging and horrible, they are not going to have any incentive to learn." In addition to making the process more enjoyable for the student, Lindsey, believed that a positive attitude can make the process better for the educator. She stated, "It is so important. It makes my teaching a whole lot more fun. It makes my teaching hit home more when they really have that genuine desire because they understand the importance of what they are doing."

To promote a positive attitude, Lisa suggested that students be exposed to the clinical world early in their education. Lisa stated, "The sooner they could apply it in a real-life situation the higher the probability that they will appreciate and value what it is they are learning." She also asserted,

"Just seeing that what they are doing actually has meaning, improves their attitude about why they are doing it and how they are doing it and making sure that it is done correctly. Rather than it does not matter, this is just for a lab assignment."

Stephanie and Heather agreed. Stephanie and stated, “I try to get them a tour of the clinical lab as soon as possible.” Heather confirmed, “I have the students visit a clinical laboratory to see what it is like. Most of them do not have any idea what it is like. So, at least they know what they are studying for.” Andrea stated,

“I tell them that I look at them as somebody who may potentially be testing my family or my friends. They potentially have that person’s life in their hands. I need to be able to trust them with my dear one’s life.”

Participants also stressed professionalism to promote positive attitude. Andrea stated,

“I also tell them that nothing magical happens after graduation. All of a sudden, they are a professional on the day of graduation. No. It doesn’t work that way. You have to be learning this stuff now the same way that you are going to be using it when you are actually a professional.”

In agreement, Heather noted that professional organizations can promote a positive attitude. Heather reported that,

“We work with ASCLS [American Society of Clinical Laboratory Science] at least once per year. We have a talk in the evening and we invite students. What I encourage them to do is go and network with supervisors and med techs in the area.”

Elizabeth also promoted the idea of professional organizations. She stated,

“I always mention lifelong learning because they need to know that after they graduate they are not just done. So, I talk to them about joining ASCLS

[American Society for Clinical Laboratory Science] or Sickle Cell Society and being professionally active.”

Abby, suggested that a having positive attitude towards learning goes beyond the professional career. She stated, “This is an investment into your future, your career. This is about getting a career, getting a job, getting a paycheck. Being able to live the life you want to live. Not just for yourself but your family.” James agreed and asserted, “It is preparing you to be more compassionate and consider things you might not consider.” This positive attitude sets the tone for students’ education, career, and lifelong learning.

Participants discussed ways to promote positive attitudes, such as keeping classes interesting and providing feedback. Ashlee said,

“I think you have to keep them interested. I have a lot of students this year complaining about other classes. I kind of listen to their complaints and then try to make sure that my class does not do the same thing.”

Ashlee also stated,

“I give them interesting case studies and apply them to topics that we are talking about. I give them things they can really relate to. It seems to engage them more and they tend to be more...they do better in class, really.”

Roland felt that feedback was essential to promoting a positive attitude. Roland stated, “We provide feedback to students based on anonymous comments in their affective assessment. This is an opportunity to engage in dialogue with the students and answer questions. Feedback and communication are key.” Instructors found that students grow as a result of engagement and feedback.

The participants of this study, like Ginsberg and Wlodkowski (2009), believe a favorable attitude is important. A positive attitude enhances learning. Participants provided several different ways to promote a positive attitude. Specifically, participants expressed the importance of engaging in dialogue about the purpose of the profession, showing the students how their education is an investment into their future, and keeping the course activities interesting were noted as the most effective methods of accomplishing the task.

Theme VI: Importance of Learning

The sixth theme that emerged from the data was the “importance of learning.” In addition to learning the required information, it is critical that students understand why the information is important. All participants agreed on this point. Lindsey utilized a Red Cross recruitment video at the beginning of her blood bank course to reinforce this idea. The video is about a man that was in a snowmobile accident; he severed both femoral arteries. The video describes the care and recovery of the patient. Lindsey explained, “[This video] gives them the impact of ‘Whoa, I have a lot to learn.’” Lindsey asserted, “It’s really important because there is a real person on the other side of what we are doing.”

Melanie stated,

“It is hugely important to prepare the students with strong study skills from early on. The students that we have seen recently are not prepared for the academic rigor of the program. So, we try to help them learn strong study skills from the beginning. The students think, ‘Oh, she is so nasty. She is not supporting us.’ They want to know exactly what to study instead of realizing that everything is

important. My philosophy is, you don't walk into the lab and they say, 'Ok, today you are going to have a sickle cell anemia and somebody who needs a transfusion.' That is not how it works in the real world. You have to be able to adapt to whatever is coming. This is why we promote strong study skills from the beginning. I want them to understand that it is all important."

Anecdotes, real life examples, and case studies assist MLS and MLT educators to help students understand the importance of what they are learning. Lisa stated, "The more an instructor can come up with real life case studies and anecdotes, the higher the probability the students will actually realize how important this knowledge is to their future." Lisa continued, "It is helping them understand with examples from a real job situation. I think it will strengthen their grasp of why it is important to their future career."

Lisa described the benefit of having a student in her MLS program who already obtained a MLT degree. She said, "When [MLS] students interact with the people who are moving from MLT to MLS, they see the importance of that knowledge." In agreement, Karla stated, "I try to say that it is not about you learning for the test. It is important to know how to apply it when you get into the workforce." Tracy also agreed and stated, "I think it is easier to learn when you can relate it to real life."

It is important to get students to recognize the big picture of healthcare. Abby stated, "Of course we always give them the statistics. As far as, 70% to 80% of the results generated by you are what the doctors use to base their diagnosis for patients." Kristie creates connections across the various courses in her MLS program. Kristie stated, "They have those lightbulb moments come on when they understand how

information connects across the different disciplines and creates a whole picture of the patient.” Kristie continued, “We really approach our education as we are trying to prepare scientists. They are going to many different diverse things in their career.”

Kristie stated, “We have to prepare scientists that can adapt that are capable of learning on their own and embracing continuing education.” Roland agreed and said,

“Students want to feel like they will make a difference in the world when they graduate and enter their careers. We want them to understand how this education and training will be applied, and useful, and beneficial to both them and the community around them.”

Elizabeth works to incorporate difficult scenarios into the laboratory practice to help the students think critically about how they approach topics and relate things back to the real world. Elizabeth stated,

“I have them take information and apply it to a situation that is when they think like professionals. For example, one time I had an oval fat body thing happening on one of the scopes. A student accidentally got immersion oil on the scope and it was all over the slide. So, I took this and turned it into an opportunity. I asked the students, ‘what is going on here?’ They had concluded that there was oil contamination and that is not a straight forward conclusion to reach. You really have to think about it.”

Many of the participants correlated the importance of the curriculum to real life experiences. They noted that real-life connections bring the big picture into focus. It is not just about passing the next test or obtaining national certification; it is about really learning and understanding the MLS and MLT body of knowledge to provide the best

patient care possible. Their descriptions show how they help students understand the importance of what they are learning and enhance meaning. In addition, sharing their experiences and anecdotes helps students develop a positive attitude towards their learning as it helps them truly understand why what their learning is important and how the outcomes that they produce in the workforce can have both positive and negative effects on patients.

Theme VII: Verifying competence

The last theme of this study is “verifying competence,” which is essential to ensure that learning and comprehension occur for students. Engendering competence is the fourth component of Ginsberg and Wlodkowski’s (2009) CRT framework. All participants agreed that verifying competency is extremely important. To verify student competence, participants used various assessment tools that fell into three categories: didactic, psychomotor, and affective.

The participants all indicated that it is important to connect information across all disciplines and apply theories to work in the laboratory. Abby explained that, she asks herself, “Is the student able to take what I taught in this environment and apply it to the lab procedure we are about to do? Also, [is the student] able to come back and piece it all together?” Lindsey agreed and stated, “I am constantly pulling things out from previous lectures to help them put it together in their brains and ask the questions which should create those connections.”

Didactic

Instructors primarily used quizzes and exams. To gauge didactic student learning, Heather stated, “The didactic part would be that they get quizzes every week and at least

four exams. So, if they don't have a quiz, they have an exam." All participants indicated that they use this method of assessment. However, more is needed to truly engender competence.

To ensure that students understand what they are learning, Abby asserted that, "Of course I have to deliver the information to you. But, I also want you to repeat back to me what I just said. But, repeat it back in a sense that you understand." Participants supplemented traditional quizzes and exams with discussion board assignments, research projects, papers, classroom discussions, and student presentations.

Kristie agreed that going beyond traditional methods of knowledge assessment is critical. She stated that it is, "hugely important. This is why I run a flipped class." In Kristie's flipped class, she records and archives her lectures online for students to review before class. Then, she assigns each student a topic; they are responsible for teaching the rest of the class about the assigned topic. She stated, "They really have to know their stuff. Not just know it but be able to explain it." Each student gets a chance to demonstrate their level of understanding.

Psychomotor

The laboratory setting is the primary location in which instructors assess psychomotor skills. Ashlee stated, "Practical exams are more of the psychomotor assessments. So, I can see their technical skills, how they are using the instruments, that sort of thing." Lindsey stated,

"In the lab, we are working on more and more skills. We are working on every little step along the way. Depending on what we are doing, I have them check in

with me at certain steps to make sure that they have done it right before moving on.”

The laboratory setting enables MLS and MLT educators to go beyond psychomotor assessment. Abby stated, “I also want to see that what is taught in the classroom is applied in the student laboratory.” In the laboratory, participants verify that students could apply their knowledge in a different setting. Participants could, therefore, gauge the students’ competence.

Heather assessed more than the ability to obtain a correct answer; she stated, “If a micro student taking way too long to do a gram stain. Not to physically do the gram stain but to read the gram stain. Also, a hematology student taking way too long to read a differential. So, we set some parameters like timing.”

Affective

Participants in this study all utilized different affective assessment. Most participants used a formal affective assessment tool of general professional behaviors that are expected in the classroom, laboratory, and workforce (e.g., the need to be professional in appearance, be courteous in communication with instructors and colleagues, be on time, and be motivated to learn).

To apply skills beyond a rubric style of assessment, Lindsey incorporated interviews into her classroom. She stated, “We have people come in and we do mock interviews and we give them feedback on the interviews.” This interview provides the student with feedback about things they can improve. The interview also highlights their strengths and prepares them to enter the workforce. Feeling connected to their learning

and obtaining feedback about their progress is necessary to engendering competence and knowing that what they are learning is of value.

Themes four through seven outline the perceptions and practices of MLS and MLT faculty related to Ginsberg and Wlodkowski's (2009) CRT framework. By utilizing their techniques – establish inclusion, develop attitude, enhance meaning, and engendering competence – the participants show how they make MLS and MLT education accessible and successful for all students. A variety of methods were described by the participants in each category. MLS and MLT educators can benefit from the participants' examples and anecdotes.

Summary

Together, all seven themes show the unique nature of diversity in MLS and MLT programs. Through review of the data, I was able describe trends in the ways MLS and MLT programs address increasing diversity. The participants emphasized the importance of promoting written and oral communication skills in MLS and MLT programs. They also provided examples of ways they address diversity in MLS and MLT course materials and textbooks. The participants' perceptions and behaviors related to diversity and education correlated with Ginsberg and Wlodkowski's (2009) CRT framework. Their framework aligns with the participants' perceptions regarding the importance of encouraging learning communities and fostering positive relationships, promoting a positive attitude, promoting the importance of learning, and verifying competence in MLS and MLT programs.

CHAPTER 5

CONCLUSIONS

This research utilized qualitative analysis to assess how MLS and MLT educators address the needs of an increasingly diverse student population and prepare students to work with patients as diversity increases. This was achieved by interviewing MLS and MLT educators to gather data about how they perceive the changing environment of laboratory science education. The goal of this study was to describe how MLS and MLT educators address diversity within their programs/classrooms. The research questions motivating this study were:

1. What are MLS and MLT instructors' perceived levels of importance for addressing the needs of an increasingly diverse student population?
2. How do MLS and MLT educators develop their understanding of cultural diversity?
3. How do MLS and MLT educators define and/or implement culturally relevant pedagogy?
4. How do MLS and MLT educators prepare their students to communicate with culturally diverse patients and members of the health care team?

The theoretical framework of this study was Ginsberg and Wlodkowski's (2009) Culturally Responsive Teaching (CRT). Ginsberg and Wlodkowski's (2009) framework requires an understanding of the relationship between culture and learner motivation,

which involves: establishing inclusion, developing attitude, enhancing meaning, and engendering competence.

Overview of Themes

Seven main themes emerged from the interview data in the study: (a) increasing diversity in MLS and MLT programs; (b) promoting strong written and oral communication skills and addresses; (c) incorporating diversity into course activities, materials, and textbooks; (d) fostering effective learning communities and the sub-theme of positive relationships between faculty and students; (e) promoting a favorable attitude towards learning; (f) understanding the importance of the curriculum; and (g) verifying competence. The data demonstrated a need for additional resources for educational activities that assist MLS and MLT faculty in their endeavors to address diversity in the classroom and promote multicultural competence.

To answer the research questions driving this study, I will discuss the following three assertions derived from analysis:

1. In recognition and response to the increase of diversity in their programs, the study participants emphasized the importance of strong communication skills for them and their students;
2. The participants of this study demonstrated a need for additional resources for addressing diversity in MLS and MLT courses; and
3. The participants of this study embodied Ginsberg and Wlodkowski's (2009) framework for CRT.

I will also include recommendations for MLS and MLT educators related to addressing diversity in MLS and MLT programs/classrooms in this chapter and address limitations of the study and possibilities for future research.

Assertion One

The first assertion of this study is, “In recognition and response to the increase of diversity in their programs, the study participants emphasized the importance of strong communication skills for them and their students.” This assertion encompasses the first two themes, which highlight the need to address diversity and identify communication as the most important skill to cultivate in students.

The first theme reflects that the study participants recognized the changing environment and increasing diversity within their programs and classrooms. This increase in diversity is not surprising as the college student population continues to become more and more diverse (Smith, 2009). The types of diversity that participants commonly noted included age, race, gender, educational background, language, and socioeconomic status. These categories of diversity align with the types of diversity in the higher education student population (Clauss-Ehlers & Parham, 2014; Smith, 2009). Participants noted that gender is a unique aspect of diversity. Smith (2009) argued that, the female demographic is increasing in higher education. However, the participants of this study described an increase in male students. MLS and MLT programs historically were female-dominated programs, but there are now male students as well.

To answer the first research question of this study, the participants were asked to identify whether they noticed changes in diversity. Participants reported that they felt strongly that there is a critical need to address the needs of all students. The participants

wanted to help all students be successful in their MLS and MLT programs. To address student needs, many of the participants utilized institutional resources such as tutors, writing centers, closed captioning services, and interpreters. The most commonly noted service needed by MLS and MLT educators was assistance with language barriers. The participants relied heavily on communication resources to help their students understand and master concepts. More specifically, the participants identified issues with written communication skills. Participants often referred students to writing centers and tutors. Overcoming language barriers is critical to the success of MLS and MLT students. They must understand the English language well enough to pass the national board of certification examination which is required to work as a MLS or MLT professional.

The second theme demonstrated by the participants' responses was "promoting written and oral communication skills." Participants indicated a critical need to prepare students with strong communication skills. The participants felt this was critically important to students' success during clinical internship and after graduation when they enter the workforce.

There is strong supporting evidence that communication skills are important to provide high quality and safe health care to patients. Higher patient satisfaction rates result from increased communication skills (Makoul & Curry, 2007; Stewart et al., 1999). Makoul and Curry (2007) emphasized the need to promote communication skills and assess those skill levels in healthcare educational programs. In addition to issues with patient satisfaction, there is a strong correlation between poor communication and patient injury (Seifert, 2012). The Joint Commission's *Sentinel Event Alert* (2008) also emphasized that strong communication skills in healthcare workers are critical to

providing safe healthcare services. These assertions in the current literature align with the findings of the present study.

Communication skills are often taught in general study courses. Muslim and Hassan (2014) asserted that general study courses and associated skills are important to education and society. However, some students feel that general study courses are a burden and have negative opinions about the courses. Muslim and Hassan (2014) stressed the important role that faculty play in emphasizing general studies and communication skills. Their quantitative study noted the negative views of students are not related to a lack of understanding of the goals associated with general studies (Muslim and Hassan, 2014). Muslim and Hassan (2014) recommended that educators emphasize the importance of general education to help reduce negative student opinions and promote a better attitude toward learning.

One participant noted the benefit of bilingualism as an enhancement to communication. Being able to communicate across two or more languages is very helpful when trying to care for diverse patients with language barriers. A bilingual employee is a great asset to employers, especially in healthcare. According to Schmalzreid and Fallon (2012), lack of an interpreter is a significant barrier in access to medical care of migrant agricultural workers in the United States. Bilingual healthcare workers overcome these barriers and are valuable resources in the workforce.

Participants all felt that addressing the needs of diverse students was very important. They recognized that challenges set by various facets of diversity in their classroom. The need to address diversity begins in the classroom and continues through clinical internships. Communication skills are a common obstacle for diverse students to

overcome in a MLS or MLT program. These skills are not only necessary to be successful in their education but also are essential when they enter the workforce as those MLS and MLT graduates will encounter a diverse workforce and a diverse patient population.

Assertion Two

Assertion two of this study is that, “participants highlighted a need for additional resources to address diversity in MLS and MLT courses.” This assertion emerged from theme three. Within theme three, the participants expressed two challenge areas: finding enough time to incorporate diversity into the already intense curriculum of MLS and MLT program requirements and determining the best methods for discussing diversity in various courses. Specifically, participants struggled to address diversity in hard science courses. Most of the participants admitted a lack of understanding about how to address diversity in their hard science courses in which most of the students’ time is spent mastering the theoretical knowledge and skills required to pass the Board of Certification exam. The volume of knowledge leaves little time to cover additional topics like diversity.

The participants of this study all agreed that addressing diversity is important. However, they require additional resources. Almost every participant indicated a desire to learn how other MLS and MLT educators incorporate diversity into their programs. NAACLS requires the incorporation of diversity in the MLS and MLT curriculum. However, the method and amount of time spent addressing diversity is left up to program faculty. Interestingly, only one participant, Tracy, indicated that her MLT program requires addressing diversity in every class – including hard science courses. Tracy

indicated that it can be difficult due to the time limits of courses such as chemistry, hematology, immunology, immunohematology, microbiology, and urinalysis.

When discussing diversity within hard science courses, the participants described indirect references to diversity. They used examples of how life style choices make some patients more susceptible to certain infectious disease. Other examples included descriptions of certain races/nationalities that are more prone to certain disease and different reference ranges for hematological and chemistry levels based on age, sex, and race. Participants describe topics that address diversity and show how diversity can affect laboratory test results and procedures. However, these topics do not address ways to understand and communicate with diverse individuals.

Professional development courses often include communication skills and diversity training. Most participants indicated that phlebotomy, management, education, special topics, and capstone courses presented diversity. When describing diversity activities in these courses, the participants described discussion board activities, writing assignments, and group work that required written communication. Participants assigned groups, mixing students from backgrounds to expose them to communication with diversity individuals.

The current literature related to higher education and diversity is extensive. There are many books and tools available to assist educators. However, the literature fails to address diversity in MLS and MLT programs and courses. Therefore, there is a significant need to fill the gap in the literature to provide MLS and MLT educators with tools and methods for incorporating diversity into the classroom instruction. The participants of this study provided examples of diversity activities that they or their

colleagues conduct in their classrooms. They all strongly emphasized the desire to learn more about what other educators do to address diversity, and indicated a need for additional resources to guide them in the best activities and methods for addressing diversity within their courses. For example, Stephanie stated, “Your topic is of interest to me because I think there is always room for improvement and I would love to learn what other people are doing.” Kristie commented, “You are filling a niche, my dear.” All the participants reported that it is hard to find time to address diversity in hard science courses due to the extent/volume of the required content. However, they all felt that diversity is an important part of MLS and MLT education. In summary, there is a significant need for resources to assist MLS and MLT educators to incorporate diversity content in courses.

Assertion Three

The final assertion of this study is that, “the study participants utilized the four basic components of Ginsberg and Wlodkowski’s (2009) framework for CRT.” Their framework includes: (1) establishing inclusion, (2) developing attitude, (3) enhancing meaning, and (4) engendering competence. The participants engaged in the fundamentals of Ginsberg and Wlodkowski’s (2009) framework through their teaching methods. However, additional recommendations and methods can be utilized by MLS and MLT educators to enhance their teaching methods. Themes four, the sub-theme of theme four, and themes five through seven reflect the behaviors of study participants that demonstrate CRT.

Participants did not specifically address CRT, but they appear to use components of CRT in their classrooms. Ginsberg and Wlodkowski’s (2009) framework requires an

understanding of the relationship between culture and motivation to learn which includes: establishing inclusion, developing attitude, enhancing meaning, and engendering competence. When asked about each of the four components of Ginsberg and Wlodkowski's (2009) method for CRT, the participants indicated that each topic was important. They described how they promote these idea/topics within their classrooms and/or programs.

Establishing inclusion

The first component of CRT is establishing inclusion (Ginsberg & Wlodkowski, 2009). Ginsberg and Wlodkowski (2009) asserted that, to be culturally responsive, educators must encourage learners to be a part of a community. This sense of inclusion is critical to a student's willingness to actively participate and ability to learn. Ginsberg and Wlodkowski (2009) emphasized, "It is in community that we find security, identity, shared values, and people who care about one another" (p. 73). They listed three possible structures for establishing inclusion: ground rules, learning communities, and cooperative base groups (Ginsberg & Wlodkowski, 2009). Theme four and its sub-theme encompass the participants' perceptions and practices related to establishing inclusion; they described learning communities as their method to achieve student inclusion.

Learning communities. For this study, learning communities are "the relationships and interactions among people through which knowledge is primarily generated" (Palloff & Pratt, 1999, p. 15). Ginsberg and Wlodkowski (2009) built on Palloff and Pratt's definition and asserted that, "learning communities are facilitating structures for the practice of collaborative learning" (p. 103). Learning communities promote a positive view of the learning institution (Retallick, Cocklin, & Coomb, 2013;

Weiss et al., 2015). Naude and Bezuidenhout (2015) also highlighted the benefits of learning communities. They reported that, “Functioning in a community of practice created an enabling environment for the development of effective teaching and learning approaches” (Naude & Bezuidenhout, 2015, p. 221). In agreement with Ginsberg and Wlodkowski’s CRT goals, Weiss et al. (2015) described learning communities as a popular method to improve student success.

Learning communities have a rich history in education in the United States. Fink and Inkela (2015) described learning communities as an important part of education when American higher education systems first formed. Learning communities evolved over the years. According to Fink and Inkela (2015), some of the traditional models of learning communities still exist. Inkela and Soldner (2012), categorized the current types of learning communities as:

1. “Paired or clustered courses;
2. small cohorts among larger enrollments;
3. coordinated or team taught courses;
4. learning communities for special populations; and
5. residentially based learning communities” (p. 12).

Fink and Inkela (2015) noted the importance of considering learning communities in online or “technology-infused” courses. They described the “flipped classroom” as being a popular method of utilizing technology in the classroom. With this method, educators can record lectures for students to review outside of class time. This allows for more time in the classroom for other activities, like case studies or problem-solving activities. One participant, Kristie, described this as her method for enhancing MLS courses. She

explained that her flipped classroom helps students understand the information she teaches. This method of instruction helps students construct meaning with their peers and encourages a deeper understanding of the information being discussed. The flipped classroom allows faculty to capitalize on valuable class time.

Past literature related to learning communities highlighted additional considerations. Anderson and McCune (2013) argued that, “effective teaching requires the creation of translational spaces and hybrid discourse that allow for movement and change, and characterises learning communities in higher education as ‘spaces of the in-between’” (p. 283). ‘Space of the in-betweens’ is where students can come to a common understanding of meaning (Anderson & McCune, 2013).

Theme five of this study highlighted that all the participants responded positively to the idea of learning communities, described their learning communities, and discussed how they encourage participation from students. Most participants described a MLS or MLT club as formal learning communities within their programs. In addition to student clubs, the participants all indicated that their students study and socialize together. Many MLS and MLT programs have a designated area for students to congregate and study. The participants noted that a specific physical location was an asset to students. Their descriptions of learning communities align with the literature. In addition, the participants utilized multiple approaches when promoting and engaging learning communities to reach all students. Their methods of engaging students can assist other MLS and MLT faculty members improve or enhance their current techniques. Different approaches to learning communities and classroom styles can be helpful in improving one’s classroom. Descriptions of techniques that worked and have not worked are important to share with

other MLS and MLT faculty members. Yet, the literature fails to address promoting and engaging in learning communities of MLS and MLT students.

Establishing strong learning communities within MLS and MLT education is critical to the success of students. It is within these learning communities that students will engage in cross-cultural communication, utilize others as a resource, and learn to construct meaning with other students. These activities are not only important during the students' MLS and MLT educational years, they are also essential to learning how to interact with others during their clinical internship and the workforce. Cross-cultural communication skills go above and beyond the MLS and MLT body of knowledge; however, they are vital to long-term success and satisfaction of the student.

The nature and appearance of learning communities continuously change as students graduate and new students begin the program. Therefore, it is important for MLS and MLT educators to always actively promote participation in the learning community. The participants noted that students who were not active participants of the learning community tended to struggle. For some students, participation in the learning community means changing their routine and that can be difficult. To highlight this point, Kristie stated,

“I think some students embrace change very well, and those are the ones that are going to be the most successful. Those who try to stay with the status quo and what's comfortable and always “worked for me” are the ones that are going to struggle.”

In summary, the participants of this study embodied the first requirement of CRT - establishing inclusion. The participants described learning communities in their MLS

and MLT programs, and all participants promoted engagement in the learning community. They emphasized that MLS and MLT club membership often help facilitate activities of the club to promote participation. Through review of the literature and analysis of the data, it has become evident that MLS and MLT educators can improve their students' sense of inclusion. This can be accomplished by incorporating multiple methods to establish and promote inclusion. All participants described a few ways to promote learning communities, but, by consistently incorporating several tools, educators can engage students that may be more difficult to reach.

Developing Attitude

“Developing a positive attitude” engages learners and helps them find personal relevance in the course material (Ginsberg & Wlodkowski, 2009). Personal relevance leads to motivation and the desire to learn. If a person understands that what they are learning is important, they are more likely to be willing to learn and understand the information. This motivation to learn is a critical component to successful application of CRT.

Experiential learning. Ginsberg and Wlodkowski (2009) encouraged experiential learning to help develop attitude and establish personal relevance. Abe (2011) described positive effects associated with experiential learning. Eyler and Giles (1999) asserted that experiential learning provides positive outcomes such as increased leadership skills, moral development, and appreciation for diversity.

The study participants shared anecdotes about experiences related to clinical internships or working as a MLS or MLT professional. These anecdotes often related to how laboratory testing affects patient care and why theoretical knowledge is just as

important as the psychomotor skills being learned in the laboratory. Participants indicated that they try to make these connections throughout the courses of the program, but noted that it is during students' clinical internship experiences that it becomes apparent.

Participants agreed that experiential learning plays a critical role in MLS and MLT education. The technical nature of MLS and MLT programs require students to enter the clinical laboratory and learn how to perform laboratory testing, connecting topics to information and theories in the classroom. Lisa stated, "The sooner they could apply it in a real-life situation the higher the probability that they will appreciate and value what it is they are learning." She also said, "Just seeing that what they are doing actually has meaning improves their attitude about why they are doing it and how they are doing it and making sure that it is done correctly. Rather than it does not matter, this is just for a lab assignment." Faculty anecdotes and clinical internships provide experiential learning to MLS and MLT students. When students work with real patient samples in the clinical laboratory, everything they learned in the classroom and student laboratory comes together.

Ginsberg and Wlodkowski (2009) recommended Smith and Kolb's (1986) model to enhance experiential learning. Smith and Kolb (1986) described a model of learning with the following components: (a) concrete experience; (b) observation and reflection; (c) formation of abstract concepts and generalizations; and (d) testing implications of concepts in new situations. The model emphasized the need for flexibility in the classroom and learning process. Smith and Kolb's model can be a useful tool for MLS and MLT educators to enhance their current methods of teaching. Experiential learning

is already a significant part of laboratory science and technician education. However, it could be expanded beyond the basic laboratory practice to other areas such as diversity activities, cross-cultural communication, and role-playing difficult scenarios with a diverse patient. Other MLS and MLT educators, along with the current literature, can help one expand their knowledge and techniques related to developing a positive attitude in their students.

Positive teacher-learner relationships. Ginsberg and Wlodkowski (2009) also promoted positive teacher-learner relationship. In agreement, Micari and Pavos (2012) reported that a strong relationship with faculty is related to success. Theme five of this study highlights that the study participants believe it is important to foster positive relationships with their students. To do this, many of the participants actively engaged in campus activities such as bake sales, theater performances, sporting events, and charity activities. Some of the participants noted that they actively sought events that involved their students. For example, Kristie, stated that she attended the basketball games when she knew her students would be there or if one of her students was a member of the team. Roland, attended orientation day events and met the students. The participants felt this exposure outside of the classroom helped students relate to them. Several of the participants felt this type of off-campus exposure helped make them more approachable.

Komaraju, Musulkin, and Bhattacharya (2010) reported that the desirable traits of an educator are being accessible, showing respect for students, and being approachable. The study participants described such factors when discussing how they promote relationships with their students. Their examples included: “be approachable,” “relate to students,” and “maintain an open-door policy.” Stephanie promoted these

relationships and found them to be fulfilling and rewarding. Elizabeth stated that the reason she promotes relationships with her students is to help them feel more comfortable in the classroom and program. Roland stated that he and his colleagues strive to attend the chapel programs once per week to “promote interaction between people outside of a formal classroom situation.” Tracy’s position required travel and she is rarely on campus. Therefore, she described focusing on meeting and spending time with students when she was on campus.

A few participants made it clear that positive relationships with their students was a priority. However, Melanie noted a significant need to define and maintain boundaries. Melanie explained that she keeps boundaries to maintain privacy. On social media, she does not accept friendship requests on Facebook from students until after they graduated. Melanie pointed out that, even though she did not feel that she forms close relationships with her students, the students felt close to the program’s faculty. Her students were noted as saying they “have more contact with faculty with our program than they have with anyone else throughout their college career.” The nature of MLS and MLT programs lends itself to these relationships even though the MLS and MLT faculty may not feel very close to their students.

The participants utilized various methods to promote a favorable attitude. They rely heavily on motivating students by showing them how classroom topics are used in the laboratory. The participants noted that they connect topics and laboratory activities to examples in the workforce. The participants often told stories about their own experiences in clinical internships and the workforce to describe how topics apply. For example, Tracy told stories about “the stress of working in the blood bank department.”

She told students about how the “right decisions can save a life and the wrong decision can cause death.” Ginsberg and Wlodkowski (2009) and the participants of this study emphasized that positive teacher-learner relationships are critical to develop a positive attitude in students. Without a relationship with one’s students, it becomes more and more difficult to establish inclusion, develop attitude, or enhance meaning.

Enhancing meaning

Ginsberg and Wlodkowski (2009) asserted that, “meaning is a constant in learning and motivation” (p.163). To be culturally responsive in teaching methods, educators must enhance meaning. “Enhancing meaning refers to those norms, procedures, and structures that expand, refine, or increase the complexity of what is learned in a way that matters to learners, includes their values and purposes, and contributes to a critical consciousness” (Ginsberg & Wlodkowski, 2009, p. 164). By enhancing meaning, learners may gain a better understanding of the topic and have a more favorable attitude towards learning. Ginsberg and Wlodkowski (2009) asserted enhanced meaning requires engagement, challenge, and intrinsic motivation. Theme six of this study describes how MLS and MLT educators enhance meaning by emphasizing the importance of the MLS and MLT curriculum. For example, Elizabeth told students about the “hard cases.” She described the atmosphere of the laboratory when a young child came in through the emergency room, the doctor would order a complete blood count, and she found cells on the differential that indicated leukemia. She stated, “It is hard cases like that that really make you understand the importance of our work.” She used emotional stories to help students develop an attitude, enhance meaning and motivate them to master the topics of hematology.

The participants of this study emphasized that it was important to show students that what they were learning is important. Participants used anecdotes, real life examples, and case studies. Lisa stated, “The more an instructor can come up with real life case studies and anecdotes, the higher the probability the students will actually realize how important this knowledge is to their future.” Lisa also stated, “It is helping them understand with examples from a real job situation. I think it will strengthen their grasp of why it is important to their future career.” It is important for MLS and MLT educators to understand that sharing their experiences from the field helps students develop a positive attitude towards their learning and it helps them enhance meaning to truly understand why what they are learning is important. Their work can cause physicians to make life or death decisions for a patient.

When culture and diversity are at the center of MLS and MLT education, educators can work to enhance meaning of the MLS and MLT curriculum, culture, and diversity. To help educators accomplish this, frameworks like CRT can be a guide. Discussion about diversity and how it affects laboratory testing will then be a natural part of the curriculum. This will also lay the ground work to promote multicultural competence and cross-cultural communication that is required when students enter the workforce. These topics and discussions need to be ingrained throughout the MLS and MLT education instead of in a single module in one course. Students must understand the importance of cultural diversity, multicultural competence, and their MLS and MLT curriculum.

Engendering Competence

Authenticity and effectiveness are two outcomes of successful assessment of course content that engenders competence in students (Ginsberg & Wlodkowski, 2009). Evaluation activities can help students feel connected to their learning and their achievements (Ginsberg & Wlodkowski, 2009). Participants used quizzes, exams, and other methods to verify competence. They went beyond basic evaluation and utilized practical laboratory exams and activities to draw connections from didactic theory and apply it in a *real-world* setting.

The participants of this study described the different types of evaluations they use in their classroom including tools to assess didactic, psychomotor, and affective skills. Participants sought connection in materials across disciplines. The participants worked to show students how the different areas of the laboratory connect.

Theme seven of this study describes the common tools for assessment and evaluation that are being used by MLS and MLT instructors. To evaluate theoretical knowledge, the participants rely heavily on the traditional examinations. The participants of this study stated that this is the best tool to gauge student learning and help prepare students to complete the American Society of Clinical Pathology's board of certification examination. In addition, this method allowed students to self-reflect on areas of weakness and strength.

To assess psychomotor skills, the participants utilized laboratory practical examinations. Educators verify the students' skill level and ability to apply theoretical knowledge in the laboratory. Abby described that laboratory assessment is not just about obtaining the correct answer. She described using laboratory practice to assess students'

technical skills; they may perform the test inappropriately and still manage to obtain the correct answer. This is also a way to evaluate time management skills. She asserted that time management is just as important because “you can’t spend all day completing one differential.” She emphasized the need to be accurate and efficient. To achieve this, she designs laboratory practice sessions that require efficiency and appropriate time management to complete the assignment.

Affective evaluations are a common tool MLS and MLT educators use to review soft skills like professionalism, communication skills, and attitude. Most of the participants utilized an affective evaluation in each class to provide feedback to students about their professional skills beyond theoretical knowledge and laboratory skills. In addition, clinical instructor reviews verify learning when students are away from campus and working through their clinical internship. Ginsberg and Wlodkowski (2009) also emphasized the importance of feedback and asserted that continuous and effective feedback is essential to engendering competence and enhancing learning.

The participants of this study utilized a variety of assessment and evaluation methods for MLS and MLT students. However, none of the participants assess their students’ levels of multicultural competence. The use of these tools can be very helpful in gauging learning and helping students reflect on their own knowledge and understanding of multicultural competence. Other programs like nursing and medical education utilize these tools with great success. Based on my findings in the literature, I believe tools similar to these would be of great use in MLS and MLT programs and classrooms.

In summary, the participants of this study embodied the basic four components of Ginsberg and Wlodkowski's (2009) CRT framework (i.e., establish inclusion, develop attitude, enhance meaning, and engender competence). However, Ginsberg and Wlodkowski's (2009) book, *Diversity and Motivation: Culturally Responsive Teaching*, provided many examples of norms, procedures and structures to enhance CRT methods. These norms, procedures and structures may be helpful to laboratory science educators seeking to improve their teaching methods. In agreement with this, the participants of this study noted a need for self-improvement and more knowledge about how to work with a diverse student population. LeAnne stated, "It would be interesting to go to a presentation and see what other people are doing. I am not exactly sure what we could do to make it more effective." Stephanie said, "Your topic is of interest to me because I think there is always room for improvement and I'd love to learn what other people are doing." Participants desired more information and resources to help guide and improve MLS and MLT educators' teaching methods.

The three assertions of this study highlight the changing environment of MLS and MLT programs. The study participants expressed the importance of meeting the needs of diverse student populations in the classroom and preparing students to work in a diverse workforce and with diverse patients. There is an additional need for resources to assist MLS and MLT educators with tools to address diversity within their courses and programs. CRT – the theoretical framework of this study - is one method for addressing diversity. The study participants demonstrated the four core components of CRT. However, additional recommendations found in Ginsberg and Wlodkowski's (2009) work can help MLS and MLT educators enhance their current methods. Unfortunately,

the current literature related to MLS and MLT programs lacks information about how to specifically address diversity in the classroom, how to engage in CRT, or how to prepare students to work in a diverse workforce and patients. All these assertions together also emphasize the critical need for MLS and MLT educators to promote effective communication skills. MLS and MLT educators need additional resources to meet this challenge.

Recommendations for MLS and MLT Educators

Per the Association of American Medical Colleges (AAMC), “It is critically important that health care professionals are educated on how their own and their patients’ demographics (e.g., gender, income, race and ethnicity, etc.) and cultural (e.g., language, religion, etc.) factors influence health, health care delivery and health behaviors.” Theme three identified an overall lack of student assessment related to multicultural competence. A cultural competence assessment tool in MLS and MLT classrooms and programs would be useful to assist educators in evaluating their students’ learning. In addition, they are a powerful feedback mechanism that can help students identify and understand their areas of strength and weakness.

The participants of this study all agreed that multicultural competence is important. Yet, they do not utilize any method of assessment. Interestingly, only one study participant, James, discussed considering using a tool for assessment of multicultural competence. This participant, however, did not like the tool and was uncomfortable utilizing it in his classroom. To fill this gap, the literature described the importance of incorporating multicultural competence assessments in medical and allied health science programs (Beach et al., 2005; Betancourt, 2006; Betancourt, Green,

Carrillo, & Ananeh-Firempog, 2003; Goode, Dunne, & Bronheim, 2006; Kumagai & Lypson, 2009; Paul, Ewen, & Jones, 2014; Seeleman, Suurmond, & Stronks, 2009). In addition, the literature provided examples of how to assess students' level of multicultural competence.

From my experience being an MLS student, I found that hearing anecdotes and stories from the field to be very inspiring. For me, this is what truly enhanced the meaning of what I was learning. All the participants of this study described this as a tool they use; however, it would be interesting to ask students how their instructors are doing and if their stories and methods are helpful. As an MLS/MLT educator, I would also like to obtain this feedback and learn about what stories are helpful or how I can further inspire my students. Enhancing meaning is an area of CRT that can assist students with their learning and educators with their approach to teaching.

Utilizing a programmatic assessment tool can be very helpful to MLS and MLT programs in reviewing their curriculum. The AAMC provided a Tool for Assessing Cultural Competence Training (TACCT). The TACCT or a similar tool can help program faculty review their curriculum, identify its strengths and weaknesses, and identify a plan for incorporating multicultural competence training.

Limitations of the Study

This study focused on assessing laboratory science faculty's perceptions of diversity. Additional information about faculty in other allied health science programs is not part of this study. Therefore, the findings only apply to MLS and MLT programs and no other allied health science programs.

This study initially was intended to address all types of laboratory science programs. However, no participants were from hospital-based programs; this also limits the depth of this study. The lack of inclusion of hospital-based programs, was not intentional as participation in the study was voluntary. The inclusion of hospital-based programs would add additional perspective to this study. Therefore, the findings of this study only apply to MLT and MLS programs within college and university settings.

An additional limitation of this study is the language of the participants. The participants were all English-speaking educators. Two of the participants identified as bilingual. However, the thoughts and opinions of the participants may be different than those of MLS and MLT educators whose primary language is not English. This study would benefit from additional perspectives from educators with language diversity.

Directions for Future Research

The purpose of this study was to address the gap in literature relating to the perceptions and practices of educators grappling with the topic of diversity in a laboratory science curriculum. The findings of this study describe how the participants perceived and addressed diversity within their institution and classroom. There are several avenues for future research possibilities. Because this study only focused on faculty, future research related to diversity in MLS and MLT programs should include current students' and recent graduates' perceptions related to the importance of addressing diversity. It is important to identify students' opinions about the adequacy of current methods for addressing diversity. A researcher could ask recent MLS and MLT graduates and current students about their perceived levels of multicultural competence. Do MLS and MLT recent graduates feel prepared to work with a diverse workforce and

patients? Future research should explore recent graduates' and current students' perceptions about their preparedness to communicate with colleagues in a diverse workforce and with patients that are different from them.

Do laboratory managers feel their laboratory and phlebotomy staff is well equipped to communicate with diverse patients? Do recent graduates have the necessary skills to communicate with patients and colleagues? Are recent graduates more or less prepared than senior staff? To fully understand these questions, researchers could interview the employers of recent graduates. It is important to assess how well prepared MLS and MLT graduates are when they enter the workforce.

This study only investigated MLS and MLT programs; therefore, additional research should expand beyond MLS and MLT programs, such as radiology technicians, pharmacy technicians, occupational therapists etc. Do these programs address diversity? If so, what types of activities and tools do instructors use to prepare their students? If not, why? This knowledge is important to advance healthcare and prepare future healthcare workers with the necessary communication skills to care for a diverse patient population.

Conclusion

According to Smith (2009), diversity should be a focus in all courses and programs because "it can serve as a powerful facilitator of institutional mission and societal purpose" (p.3). As diversity continues to increase in health care, it is critical to overcome the challenges in the classroom and prepare students to function in a diverse society. It is important to promote high levels of multicultural competence before students graduate and enter the workforce to care for diverse patients. The participants

identified communication as the most critical skill for MLS and MLT students.

Communication skills provide MLS and MLT graduates with the ability to work with diverse colleagues and care for diverse patient populations. The participants of this study noted a critical need to develop resources that guide laboratory science educators as they strive to improve multicultural competence and effective communication skills in MLS and MLT professionals. As a former MLT program director, I believe these resources would have been beneficial to my educational career. I learned through trial and error how to address diversity in my classroom and how to help prepare students to address diversity in society. MLS and MLT faculty can learn from each other to improve teaching methods and bring diversity to the center of their students' education.

Ultimately, this will result in a stronger laboratory workforce and the betterment of healthcare.

Appendix A

Interview Questions

The questions listed below will guided me through the interview process. The questions were designed to assist in asking basic demographic/background questions as well as open-ended questions that prompt the participant to reflect on their beliefs and practices related to diversity and laboratory science education.

1. Tell me about your educational background?
2. Tell me about the program you teach in.
3. How do you prepare to teach a course?
4. What does diversity look like?
5. What types of diversity do you see in your classroom/program?
6. How do you address student diversity in your course materials?
 - a. What examples of course material, textbooks, etc. do you have about diversity?
7. When you have a diverse group of students in your classroom, does it affect your teaching?
 - a. If so, how?
 - b. If not, why do you think that is?
8. Do you believe that it is important to address the needs of culturally diverse students?
 - a. Why or why not?
9. Have you seen/witnessed any education inequities in your career as an MLS/MLT educator.
 - a. If so, please describe the situation.
 - b. If so, what actions did you take to help reduce those inequalities?
10. Where do you think diverse students struggle in your classes?
 - a. How have you helped them?
11. Are diverse students a part of the learning community?
 - a. How so?

- b. What have you done to encourage participation in the learning community?
12. Describe what multicultural competence means to you.
- a. How does this affect the way you teach?
13. Describe program and institutional policies related to diversity?
- a. If so, how do these policies affect your teaching?
14. How important is it to you to establish a relationship with your students?
- a. How do you establish and foster these relationships?
15. How important is it to you to encourage students to create relationships with other students?
- a. How do you promote building those relationships?
16. How do your students communicate in the classroom?
- a. Do you see students engage in communication with students from different cultural backgrounds?
- b. If so, please describe those interactions.
17. How important is it to you to promote a favorable attitude in your students towards their learning?
- a. How do you help your students accomplish this?
18. How do you help your students feel that what they are learning is important?
19. Do you feel that it is important to help them understand the importance of their education as it relates to their future career?
- a. If so, how?
- b. If not, why do you think that is?
20. In what ways do you help students verify their competency in their learning?
- a. Didactic
- b. Psychomotor
- c. Affective – including ability to work with other students effectively and cultural competence
21. What questions do you have for me?

Appendix B

Recruitment Email

The email below was sent via the Clinical Laboratory Science Educator Listserv twice to recruit possible participants for this study.

Email Subject: Research Participation Invitation: Diversity in Laboratory Science Education

Email Content:

My name is Christie Massen and I am a graduate student at the University of North Dakota working on completing my doctoral dissertation. I am looking for participants to volunteer to meet for an interview that will take approximately one hour. The meetings will take place online using Skype or other online platform and will be arranged at your convenience. If you are willing to participate, please contact me via email at cmassen@icloud.com or by phone at 701-527-2244.

The purpose of the research project is to identify how laboratory science educators are addressing student diversity in their classrooms/programs. My findings will help other laboratory science educators understand the current perceptions of student diversity and best practice within laboratory science education.

This email message is an approved request for participation in research that has been approved or declared exempt by the University of North Dakota Institutional Review Board (IRB).

This project IRB-201511-148 was approved by the University of North Dakota IRB on November 11th, 2015. Pertinent questions or concerns about the research, research participants' rights, and/or research-related injuries to participants should be directed to the IRB Coordinator, Michelle Bowles (701-777-4279).

Thank you!

Christie Massen M.S., MLS(ASCP)

Appendix C

THE UNIVERSITY OF NORTH DAKOTA CONSENT TO PARTICIPATE IN RESEARCH

TITLE: Addressing Diversity in Medical Laboratory Science
Education

PROJECT DIRECTOR: Christie Massen M.S., MLS(ASCP)

PHONE # 701-527-2244

DEPARTMENT: Teaching and Learning

STATEMENT OF RESEARCH

A person who is to participate in the research must give his or her informed consent to such participation. This consent must be based on an understanding of the nature and risks of the research. This document provides information that is important for this understanding. Research projects include only subjects who choose to take part. Please take your time in making your decision as to whether to participate. If you have questions at any time, please ask.

WHAT IS THE PURPOSE OF THIS STUDY?

You are invited to participate in a research study about student diversity in Medical Laboratory Science Education because you are a Medical Laboratory Science/Medical Laboratory Technician educator or program director.

The purpose of this research study is to identify how laboratory science educators are addressing student diversity in their program/classroom and preparing students to work in a diverse workforce.

HOW MANY PEOPLE WILL PARTICIPATE?

Approximately ten to fifteen people will take part in this study. All interviews and data collection will occur virtually via Skype.

HOW LONG WILL I BE IN THIS STUDY?

Your participation in the study will last the only during the duration of the interview. You will need to meet virtually with the researcher one time. The interview will take approximately one hour.

WHAT WILL HAPPEN DURING THIS STUDY?

The interview will follow the following course of events:

1. Introduction of participant and researcher
2. Overview of the process
3. Verification of informed consent (verbal and documentation)
4. Qualitative, open-ended interview questions will be asked
5. Opportunity for participant to ask questions
6. Closing statements

WHAT ARE THE RISKS OF THE STUDY?

There will be minimal risk from being in this study. Although, some questions may be of a sensitive nature and you may become upset as a result. However, such risks are not viewed as being in excess of “minimal risk.”

If, however, you become upset by questions, you may stop at any time or choose not to answer a question. If you would like to talk to someone about your feelings about this study, you are encouraged to counseling support if needed.

WHAT ARE THE BENEFITS OF THIS STUDY?

You may not benefit personally from being in this study. However, we hope that, in the future, other people might benefit from this study because the themes identified and discussed will help fellow laboratory science educators address student diversity and prepare students to function in a diverse workforce.

WILL IT COST ME ANYTHING TO BE IN THIS STUDY?

You will not have any costs for being in this research study.

WILL I BE PAID FOR PARTICIPATING?

You will not be paid for being in this research study

WHO IS FUNDING THE STUDY?

The University of North Dakota and the research team are receiving no payments from other agencies, organizations, or companies to conduct this research study.

CONFIDENTIALITY

The records of this study will be kept private to the extent permitted by law. In any report about this study that might be published, you will not be identified. Your study record may be reviewed by Government agencies, the UND Research Development and Compliance office, and the University of North Dakota Institutional Review Board.

Any information that is obtained in this study and that can be identified with you

will remain confidential and will be disclosed only with your permission or as required by law. Confidentiality will be maintained at all times and only the researcher, Christie Massen, and student advisor, C. Casey Ozaki, will have access to the data.

If we write a report or article about this study, we will describe the study results in a summarized manner so that you cannot be identified.

The interviews will be digitally recorded; therefore, participants have the right to review/edit the recordings.

IS THIS STUDY VOLUNTARY?

Your participation is voluntary. You may choose not to participate or you may discontinue your participation at any time without penalty or loss of benefits to which you are otherwise entitled. Your decision whether or not to participate will not affect your current or future relations with the University of North Dakota.

CONTACTS AND QUESTIONS?

The researcher conducting this study is Christie Massen. You may ask any questions you have now. If you later have questions, concerns, or complaints about the research please contact Christie Massen at 701-527-2244 or supervising advisor, Dr. C. Casey Ozaki, at 701-777-4256.

If you have questions regarding your rights as a research subject, you may contact The University of North Dakota Institutional Review Board at (701) 777-4279.

- You may also call this number about any problems, complaints, or concerns you have about this research study.
- You may also call this number if you cannot reach research staff, or you wish to talk with someone who is independent of the research team. General information about being a research subject can be found by clicking “Information for Research Participants” on the web site: <http://und.edu/research/resources/human-subjects/research-participants.cfm>

I give consent to be audiotaped during this study.

Please initial: ___ Yes ___ No

I give consent to be videotaped during this study.

Please initial: ___ Yes ___ No

I give consent for my quotes to be used in the research; however, I will not be identified.

Please initial: Yes No

Your signature indicates that this research study has been explained to you, that your questions have been answered, and that you agree to take part in this study. You will receive a copy of this form.

Subjects Name: _____

Signature of Subject

Date

I have discussed the above points with the subject or, where appropriate, with the subject's legally authorized representative.

Signature of Person Who Obtained Consent

Date

Appendix D

Assertions, Themes, and Codes

Assertion	Theme	Codes		
In recognition and response to the increase of diversity in their programs, the study participants emphasized the importance of strong communication skills for them and their students.	I – Increasing Diversity	Diversity Age Sex Gender	Deaf Colorblind Religious Sexual orientation	Ethnicity/Race SES Family life Language
	II – Promoting written and oral communication	Accommodations Attrition Bilingual Communication	ESL/ELL Feedback Increased workload Learning disabilities	Poor communication Tutors Transcription Writing Centers
The participants of this study address diversity in their courses. In hard science courses, discussion about diversity relates to how age, gender, race, and lifestyle can affect laboratory testing and results. Diversity discussion is typically addressed in professional development courses. The participants also demonstrated a	III – Addressing diversity in MLS and MLT	Objectives Accuracy Alignment Preparation Hard sciences Soft sciences Chemistry Heme/Coag Blood Bank	Body of knowledge Textbook Supplemental information Immunology Microbiology Phlebotomy Education Management	Content Readability Visual aids Lack of time Hard science Soft Science Difficult Healthcare

need for additional resources to assist them in incorporating diversity in their MLS and MLT courses.				
The participants of this study embody Ginsberg and Wlodkowski's (2009) framework for Culturally Responsive Teaching.	IV – Encouraging learning communities	Immersion Integrating Group activities	School activities School clubs	Study groups Student organizations
	IVa – Fostering positive relationships	Relationship Positive Support	Encourage Open	Approachable Mentor
	V – Promoting a positive attitude	Teaching style Positive Attitude	Enjoy Investment Enthusiasm	Future Happy
	VI – Importance of MLS and MLT curriculum	Body of Knowledge Board of Certification Career/Job	Medical Decision Patient care Diagnosis	Continuing Education Relevance
	VII – Verifying competence	Exams Assignments Affective Psychomotor	Didactic Laboratory Practice Competence Feedback	Validation Application Connections Lab practicals

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