

LGBTQ Secondary Mathematics Educators: Their Identities and  
Their Classrooms

A Dissertation

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## **Dedication**

To Richard Wood, the G.O.A.T. of secondary mathematics teaching.

## **Abstract**

This qualitative research study is an investigation of mathematics teacher identity with gay and lesbian identity in two high school mathematics teachers. I use the conceptual framework of queer theory in order to demonstrate a deconstruction of the binaries and heteronormativity often associated with mathematics. This research is a case study that will contribute to the understanding of gay and lesbian high school mathematics teachers with a focus on their identities and their classrooms.

Key words: *LGBTQ, mathematics, curriculum, pedagogy*

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## List of Abbreviations

ACLU	American Civil Liberties Union	3
AERA	American Educational Research Association	38
AIS	Androgen Insensitivity Syndrome	13
AP	Advanced Placement	64
CAH	Congenital Adrenal Hyperplasia	13
GLAAD	Formerly Gay & Lesbian Alliance Against Defamation	32
GLSEN	Gay Lesbian and Straight Education Network	31
GSA	Gender and Sexualities Alliance	3
LGBTQ	Lesbian, Gay, Bisexual, Transgender, Queer/Questioning	1
STEM	Science, Technology, Engineering, Mathematics	1
WHO	World Health Organization	13

## Chapter I

### Introduction

Our world is constantly facing complex problems that we attempt to solve through our knowledge of science, technology, engineering, and mathematics (STEM). Unfortunately, the STEM fields historically have been dominated by white, cisgendered, heterosexual males, and this limits the types of solutions created to solve problems (Hughes, 2018; Page, 2007). When the lesbian, gay, bisexual, transgender, and queer/questioning (LGBTQ) population is not represented within the groups that are solving the problems, a sense of urgency may not exist on the part of the researchers (Yoder & Mattheis, 2015), educators, teachers, and policymakers to produce a solution (Hughes, 2018; Page, 2007). For example, the history of AIDS in the United States tells us that when a sickness is labelled as "the gay disease", public health support systems and an early intervention for a cure are not taken seriously (Shilts, 2007). The HIV/AIDS experience in the United States has revealed that when "othering" happens, a solution, as well as the engagement to understand the

marginalized issue, lags behind - affecting everyone, not just the disenfranchised group. The history of the HIV/AIDS epidemic is an excellent way to showcase how STEM fields intersect with culture, religion, poverty, race, politics, economics, and sexuality to force the "objective unbiased ideals" of the STEM community to disintegrate and support discriminations inherent in the sociopolitical systems. Therefore, marginalization in STEM fields not only influences learning but also affects those who teach.

In the context of teaching and learning, students who are not from similar sociocultural and sociopolitical backgrounds may also sense that toeing the standard middle class heterosexual norms is part of STEM learning. This type of heterosexual normalizing in teaching and learning needs to be disrupted, and this case study attempts to do just that through an in-depth look at the curriculum and pedagogy of two secondary mathematics teachers: a gay man and a lesbian.

Mathematics fields are traditionally dominated by white, heterosexual, cisgendered males (Hill, 2009), and education is a field that is dominated by white, heterosexual, cisgendered females (Gray, Bitterman, and Goldring, 2013). Because of this combination, few racial and sexual marginalized youths see themselves represented in

mathematics classrooms (Sapon-Shevin, 2004). The struggle for LGBTQ students in public schools can be eased with teachers, counselors, and staff who create a sense of community for those students through Gender and Sexualities Alliance (GSA) clubs and other organizations that celebrate LGBTQ students' identities (Wimberly, Wilkinson, & Pearson, 2015). LGBTQ mathematics educators who are open with their identities in their school districts can help create a bridge for LGBTQ students to a mathematics related degree, employment, and world changing problem solving opportunities. Nevertheless, in order for LGBTQ mathematics educators to support LGBTQ learners, the LGBTQ mathematics educators need to find ways to share and discuss their own LGBTQ identities, and the sharing of LGBTQ identities in a heteronormalized institution such as a school is fraught with challenges and the possibility of being labeled as a social outcast.

High school teachers who identify as LGBTQ are compelled to pass through several psychologically difficult choices of whether or not to be "out" (publicly open about one's sexuality and/or gender identity) at a school, even though the teachers would serve as role models for LGBTQ students. These risks are affirmed by the American Civil Liberties Union (ACLU): their data discloses that only 20 states have

non-discrimination policies for sexual orientation and gender identity (ACLU, 2017); therefore, the firing of a teacher for such a public declaration is legal (Graves, 2015). Even with legal protections in place, the public ostracizing that can occur with the knowledge of a teacher's sexuality or gender identity can be incredibly damaging (Graves, 2015). For example, the city in which I taught for the final 14 years of my career passed non-discrimination policies for sexual orientation and gender identity in August 2013 (LGBTQ Nation, 2013). For my final two years of teaching, I did not have to live in fear of losing my job, and the consistent agitation that the wrong group of parents or the wrong administrator could end my career was alleviated. Those teachers living without non-discrimination policies live with that fear, and moving to a new community to restart a career may not be an option; therefore, many teachers, particularly in socially and politically conservative areas of the country, choose to keep their true sexualities or gender identities hidden (Connell, 2015).

Although identity is an important part of my research, the study is framed by queer theory in order to determine how gay and lesbian identities can disrupt the heterosexual norms of schools. Queer theory is centered on the

deconstruction of the sexual and gender binaries, as a conceptual and analytical framework as Luhmann (1998) states, "*queer* aims to spoil and transgress coherent (and essential) gender configurations and the desire for a neat arrangement of dichotomous sexual and gendered difference" (italics by author, p.145). The queer theory framework names identity dichotomies as socially created structures that define norms (Jagose, 1996); for instance, if heterosexuality is the norm, homosexuality becomes the other, and when male is the norm, female becomes the other. However, sexuality, gender, and biological sex are not binary constructs because there are various sex chromosomal karyotypes and hormonal patterns that make humans appear to be more male or more female. Confounding sex, a biological construct, with gender, a social construct, has created sociocultural and sociopolitical discrimination and has produced many incarnations of the term gender to define masculine and feminine phenotypes and other social norms.

Because of the strict mathematics teacher stereotypes, this study research aims to address the following questions: 1) how does the intersection of LGBTQ identity and mathematics identity impact secondary mathematics teachers' abilities to create inclusive spaces in their schools? and 2) how do open LGBTQ secondary mathematics

teachers accept their duty to serve as role models for all students?

## **Chapter II**

### **Literature Review**

The following section reviews the relevant literature that provides the historical and theoretical context for the study. I will begin with the development of queer theory as a theoretical framework and move into the concept of identity and the position identity plays in this study. Finally, there will be a review of the pertinent literature on LGBTQ teachers and students, and the effect of their LGBTQ identities on their teaching and learning in mathematics classrooms.

#### **Queer Theory**

Over two decades ago, Fennema and Hart (1994) pushed for the use of the feminist theory framework in mathematics education research in order to give women a voice in mathematics. At that time, it was well known that females had a mathematics achievement gap when compared to males, and females would consistently show less confidence in mathematical ability than males. The combination of lower confidence and achievement led to stereotyping women and girls as having mathematics anxiety (Fennema & Hart, 1994); yet, no researchers had considered the possibility that women and girls viewed mathematics as restrictive to their futures and therefore not worth learning (Fennema & Hart,

1994). Today, LGBTQ students show similar achievement gaps and lower confidence levels when compared to their non-LGBTQ peers (Wimberly, Wilkinson, & Pearson, 2015). I argue that the use of the queer theory framework in mathematics education research is the next logical step to make mathematics accessible to all students through a focus on LGBTQ students and educators.

In 1990, Judith Butler published *Gender Trouble*, and, in 1991, Teresa de Lauretis coined the term "queer theory" for theorizing lesbian and gay sexualities when she edited a special issue of the journal *differences*; these two occasions separated queer theory from feminist theory and critical theory, and queer theory became a stand-alone critical analysis framework. De Lauretis posited that queer theory started with the application of three critical lenses: 1) the idea that heterosexuality is not the standard to compare all other sexualities, 2) that gay and lesbian studies is not a single subject, and 3) that race plays a significant role in sexual subjectivities (1991). The first lens pushes against heteronormativity and the assumption made by society that all sexualities outside of heterosexual are the "other" sexualities, while the second lens posits that gay and lesbian studies is intertwined with gender and its role in patriarchal systems. Finally,

the third lens highlights the intersectionality between race and sexuality; for example, gay African American males struggle with acceptance because of the hypermasculinization of African Americans. Queer theory has drawn criticism from researchers such as Lovass, Elia, and Yep (2006) for not having enough research in the second and third lenses. Lovass et al. (2006) argue that queer theory is weak on attacking the patriarchy and dealing with racism. All of these lenses have been implemented in various capacities throughout educational research; yet, they are still just lenses, and one of the strengths of queer theory is that it has not been given a strict definition, which implies that queer theory can be adapted to new situations.

Due to queer theory being a flexible concept, the framework is allowed to evolve. The term queer is itself difficult to define and often has changed meaning throughout history as it has moved from strange to gay to not heterosexual to transgender to gender and sexualities as fluid and is still routinely something new. As humans have developed complex social structures comprised of families, cities, and nations, dichotomous categories such as men and women, rich and poor, have continuously been formed (Butler, 2007). Even when researchers attempt to

explicitly define a person and environment, it is quite possible that an oppositional person within that environment will arise; for example, with heterosexual comes homosexual, and with male comes female (Butler, 2007). This research will be viewed through the queer theory framework as defined by Meyer (2010), who stated that "queer is understood as a challenge to traditional understandings of gender and sexual identity by deconstructing the categories, binaries, and language that support them" (p.20). This definition is current and relevant to this study, which aims to analyze mathematics classrooms and LGBTQ mathematics teachers in terms of identity and inclusion. Stereotypically mathematics classrooms are seen as rigid and procedural, with students divided into "those who get it" and "those who do not get it." The Meyer definition of queer theory will help this study to examine those binaries and explicitly name disruptions to categorizing through both the pedagogy and the curriculum of the teacher.

Mathematics was the last of the core subject areas (communication arts, mathematics, science, social studies) to address queer perspectives and use queer theory as a theoretical framework for educational research (Rands, 2016); in spite of that, it is uniquely suited for my

study. In parallel to the use of queer theory to reflect on pedagogy, curriculum, and inclusion in the humanities, arts, and science, queer theory can be applied to the subject of mathematics. Research has shown that when pedagogy and curriculum are viewed through feminist and anti-racist lenses, they reproduce racial, gendered, and class-based power relations through institutions, ideologies, and practices (Luhmann, 1998). Similarly, when pedagogy and curriculum are critiqued through a queer lens, they reproduce heteronormative practices. This study will document views of mathematics education through a queer theory lens based on queer mathematics teachers so as to highlight the influence of the dichotomous and heteronormative mathematics content and teaching.

While considering queer pedagogy for science education, Lundin (2014) developed a framework for heteronormative teaching, which includes: 1) repetition of desirability, 2) dichotomization of sexes, 3) differentiation of sexualities, 4) hierarchy of positions, 5) marginalization, 6) issue making, and 7) personation. Lundin's (2014) framework can also be appropriately applied to mathematics education; while this is not the goal of this study, it does provide valuable insight into how mathematics classrooms may be routinely structured. There

must be a fundamental shift in the way textbooks are written, curricula are implemented, and teachers are interacting with students in order to move beyond the addition of queer people to problem sets and into full inclusion and avoidance of marginalization (Rand, 2009). Lundin's (2014) work in science is considered due to the objective nature of mathematics and science and the interconnectedness of the subject areas.

Considering science education through a queer theory framework, studies on textbooks show biology textbooks remain silent on sexualities outside the heterosexual norm, as well as gender outside of the relationship to biological sex (Fifield & Letts, 2014; Lundin, 2014). The studied texts mention homosexuality only in relation to HIV/AIDS and mention only two sexes when chromosomally there are several (Lundin, 2014). More specifically, biology curriculum "involves a hypothetically perceived tension between the biological and well-established definition of sex as opposed to gender theories pointing out the social dimensions of gender" (Lundin, 2014). A biology classroom, with its units on human reproduction and anatomy is a natural setting to introduce various sexes; yet, the biology curriculum continues to focus on the sexes as binary (Lundin, 2014). This creates an illusion among the

general population that every human is born as either a male (XY) or a female (XX) when, in fact, several different chromosomal and hormonal possibilities exist. Rand (2009) argues that mathematics textbooks and curricula must undergo similar scrutiny in terms of LGBTQ inclusion and that the inclusion should be thorough.

In a synthesis of research on sex and sexuality, the World Health Organization (WHO, 2015) suggests that "in a few births per thousand some individuals will be born with a single sex chromosome (45X or 45Y)(sex monosomies) and some with three or more sex chromosomes (47XXX, 47XYY, or 47XXY, etc.)(sex polysomies)"; nonetheless, most students are taught that humans are born as either male (XY) or female (XX). Chromosomes are not the only requirement for separating humans into biologically male or female categories; hormones also play a critical role. Congenital Adrenal Hyperplasia (CAH) causes females (XX) to develop an outwardly male appearance, and the opposite to CAH, Androgen Insensitivity Syndrome (AIS) causes males (XY) to develop breasts and external female genitalia (WHO, 2015). According to Meyer (2010), when the chromosomal and hormonal variations are combined, approximately 1.7% of the population does not fit neatly into the categories of male or female. These variations lead to a disruption of the

biological sexes as binary and an expansion of identity associated with sex. Because the definitions of sexuality are based on biological sex, it must follow that there will be sexual identities that do not fit neatly into the binary categories of heterosexual or homosexual.

Given the confusion regarding the spectrum of biological sex and gender, opportunities exist for changes in mathematics curricula and pedagogy to create more inclusive classroom spaces, yet there is little research on whether or not this is actually happening. Kumashiro (2002) called for better use of survey and data in mathematics and statistics classrooms, which could include multiple options for gender and sexuality demographics, and while that is a step in the right direction, it is not nearly sufficient. There are numerous ways to incorporate LGBTQ activities into algebraic linear programming problems, such as finding the cheapest way to attend prom when the dress code is formal but not gender specific; or through modeling in any course involving functions, such as modeling the spread of the use of the singular they/them through a community. Connecting mathematics to the lives of all students will create a more inclusive classroom for all marginalized groups, not just those who identify as LGBTQ. This study will delve into mathematics teachers' uses of inclusive

problems and activities in their curricula and in their classrooms.

### **Identity**

Everyone has various characteristics or aspects of themselves that they consider to be a part of their identity that have been formed through a complex emotional and social process. Some of those aspects are connected through societal performances or narratives (Butler, 2007; Gee, 2000; Sfard & Prusak, 2005), while others are considered to be a part of the person's nature. For example, there are times when a mathematics teacher is teaching that would be considered a societal performance, but if the mathematics teacher happens to be left-handed, that is considered part of their nature. Wenger (1998) describes the construction of identities through a constant reformation and renaming as members of various communities into one identity. As preservice mathematics teachers transition from college students to inservice teachers, they rename themselves and shift their identities. As a college student, a preservice mathematics teacher might comfortably identify as LGBTQ, but upon becoming a public school teacher, their LGBTQ identity may move from a space of relative freedom and safety to one of vulnerability. However, throughout that identity transformation, they

would remain left-handed.

Burke and Stets (2009) name these interconnected ways to view reifications of identity in three umbrella terms of identity: role identity, social identity, and person identity. Role identity is based on the position a person occupies in a given space, such as a mathematics student during a mathematics class. Social identity revolves around membership in certain groups and creates people who are dubbed "in" or "out" by the members of the groups (Burke & Stets, 2009). Finally, person identity is formed through traits unique to the individual that define a person, such as nurturing or mean-spirited. Therefore, LGBTQ mathematics teachers take on a role identity in their mathematics classrooms that may be quite different from their social identity outside of school and their LGBTQ person identity.

The categories developed by Burke and Stets (2009) can be compared and contrasted with those given by Gee (2000): nature, institution, discourse, and affinity. Nature-identity consists of attributes that are considered naturally developed or even genetic. For example, left-handedness is considered a nature-identity. On the contrary, Burke and Stets (2009) do not define any identity traits that are genetic for the individual. Institution-identities are developed through connections with certain

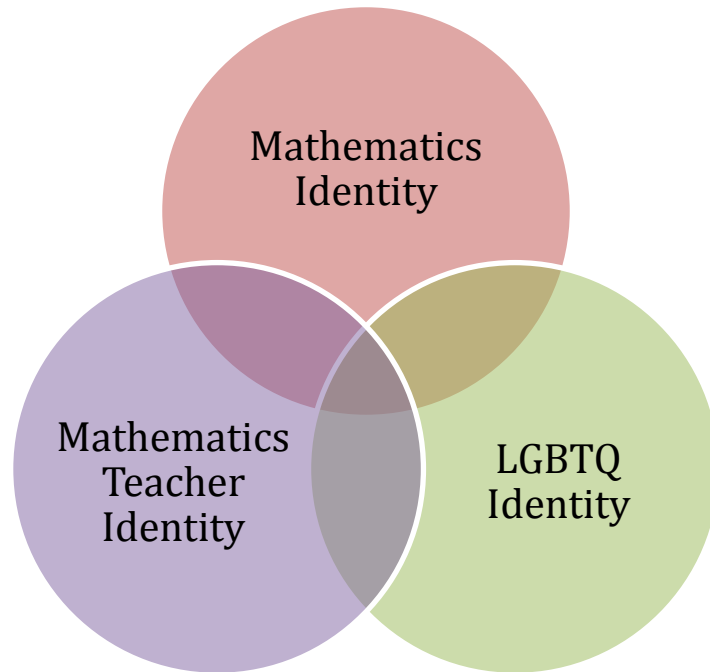
institutions. For instance, mathematics teachers may work for both a public high school and a university, and each of those institutions labels those people as mathematics teachers or mathematics instructors. Institution-identity is similar to role identity for Burke and Stets (2009). Discourse-identities are structured through the interactions one has with others and through discourse; mathematics teachers might be identified as mathematicians, even though they have never worked exclusively in that field. Discourse-identities run parallel with the person identity of Burke and Stets (2009). Finally, affinity-identities come about because of groups with whom one associates. For instance, Harry Potter fans who have collected items associated with the franchise immediately recognize those artifacts when they encounter other fans. Burke and Stets (2009) named this category the social identity. While each of the identity categories is important, the major focus of this study will be on the institution-identity or role identity of secondary mathematics teachers and the intersection with the affinity-identity or social identity of LGBTQ people.

Research on gay and lesbian teachers led Catherine Connell (2015) to identify three categories with respect to the intersectionality of their sexual identity and their

professional identity: splitters, knitters, and quitters. The splitters are gay and lesbian teachers who keep their sexuality completely separate from their lives as teachers. Next, the knitters are the teachers who weave their gay or lesbian identity into their teacher identity. Finally, the quitters are the teachers who cannot handle the separation or combination of their gay or lesbian identity with their professional identity, so they leave the teaching profession. Unfortunately, Connell (2015) does not provide the subject area of her participants, so we do not know how many of the splitters, knitters, and quitters teach high school mathematics. One interesting insight would have been to compare the number of gay and lesbian high school mathematics teachers who identified as splitters, knitters, and quitters to the other subject areas. The following section will define LGBTQ mathematics teacher identity.

### **LGBTQ Mathematics Teacher Identity**

This research is focused on the intersection of three different identities in LGBTQ mathematics teachers: mathematics identity, mathematics teacher identity, and LGBTQ identity (see figure 2.1). This section provides the definitions of these identities.



*Figure 2.1* Venn Diagram of Identities

I define mathematics identity as the way people describe themselves as capable of understanding mathematics content and problem solving through their own narrative (Burke & Stets, 2009; Gee, 2000). For the purposes of this study, I consider "understanding mathematics content" to be those contents and practices of mathematics that are relevant to teaching mathematics known as content knowledge for teaching mathematics (Ball, Thames, and Phelps, 2008). Many disciplines use "problem solving" as a method of teaching, but in this study, I use "problem solving" in the context of doing mathematics. Mathematics at its core and as a discipline practices problem solving in all forms. Hence, through an individual teacher's mathematics

identity, mathematics content and practices will be visible in uniquely mathematical ways. According to Greslafi and Cobb (2011), the teaching identity a teacher forms "concerns the extent to which he or she identifies with others' expectations for competent teaching in that context" (p. 275). Mathematics teachers will have mathematics teaching identities that combine their understanding of mathematics content with their view of how they meet the performance norms of teacher, or by viewing teaching as an act (Darragh, 2016).

I argue that LGBTQ identity is the way people perform their self-declared label within the LGBTQ spectrum (Butler, 2007). LGBTQ identified people break heterosexual and gender norms. Because mathematics is associated with heterosexual, cisgendered, white male norms, the intersection of mathematics identity with gay or lesbian identity may lead to conflicts within the individual narrative of a gay or lesbian identified individual who also identifies as proficient in mathematics.

For LGBTQ mathematics teachers, the mathematics identity and the LGBTQ identity must also exist with the identity of teacher. Identities coexist and intertwine, and the notion that in certain situations one identity may be more prominent than others has led to the concept of a

"leading identity" (Black et al., 2010), which is especially important in terms of LGBTQ mathematics teacher identity. When an individual is in the context of educational settings, the mathematics identity can become the leading identity (Black et al., 2010), which affects the identity construct of LGBTQ mathematics teachers. If, while in the classroom, the LGBTQ identity is secondary to the mathematics identity or the teacher identity, then LGBTQ mathematics teachers may be reinforcing the status quo of mathematics as heteronormative and dichotomous. By investigating secondary mathematics teachers who are open with their LGBTQ identities, this study aims to discern how mathematics identity and LGBTQ identity influence the performance in the classroom.

Gender is one aspect of identity that can encourage or discourage participation in mathematics. Using the nature-identity construct, women have been labeled as genetically guided by emotions, whereas men have been labeled as rational and logical when it comes to problem solving (Ahlqvist, London, & Rosenthal, 2013). As the identity of mathematics professionals is used in society and through discourse, the nature-identity construct of women not being good problem-solvers becomes intertwined with the institution-identity, the discourse-identity, and the

affinity-identity, and these combinations can turn women away from pursuing careers in STEM fields (Ahlqvist et al., 2013), and in particular, mathematics. Because gender intersects heavily with stereotypes of LGBTQ individuals (Butler, 2007), the same labels that keep women away from mathematics fields also keep LGBTQ people away from mathematics fields.

Mathematics teachers' identities are influenced by social structures of schools as well as the teachers' personal lives (Hodges & Cady, 2012). Teachers negotiate their identities as they participate in classrooms through curriculum, instruction, and professional development. Mathematics teacher identity can be viewed as a nature-identity since society dubs people as "born to teach," and mathematics is often considered a subject that students "either get or don't get," and the institution-identity is then reinforced through the professional lives of the teachers. The discourse-identity of a mathematics teacher quickly follows as personal communities spend time including work in their discussions. Once the teachers begin to join professional organizations and sponsor clubs, extracurricular activities or athletic teams, the affinity-identity is cemented.

In conjunction with the growth of the mathematics

teacher identity, individuals are also negotiating their sexuality and gender identities. While some people "have always known" who they were attracted to or which gender they most strongly identified with, some people do not feel those identities are fully developed until much later in their lives. In either circumstance, sexuality or gender identity is still morphing through the four views posited by Gee (2000), along with the identity of mathematics teacher. There are debates over whether sexuality and gender are determined by nature or nurture; yet, whether one fits into the norms of society determines the ease with which they accept their sexuality and gender identities. As individuals move into their sexuality and gender identities, they are constantly negotiating how those identities fit into the larger context of being a mathematics teacher. Because mathematicians are stereotyped as masculine and rational, weaving in the LGBTQ identity creates a complex mix in which lesbians and transmen are seen as a more natural fit than gay men and transwomen. I will examine carefully the intersectionality of mathematics teacher identity with LGBTQ identity.

### **Teachers and Teaching**

In the 1800s when public education began in the United States, teachers were educated, young, and single women who

society believed could work well with children due to their maternal and caring nature (Goldstein, 2014). However, the combination of the growth of the field of psychology and women's rights through the early twentieth century changed the way society viewed single, educated women; with these developments, they began to be viewed as either lesbians or sexual deviants who were a threat to the normal growth of sexual desires in children (Blount, 1996). This progression of the views of women and their place in the family led to the marriage ban for teachers being dropped shortly after World War II. Society then pushed for academic subjects to be taught by married women, while men took over vocational education and administration (Blount, 1996). Positioning in this manner meant that men would be financially superior to women, as vocational education teachers were paid on a twelve-month contract, like administrators. The financial advantages of these positions allowed men to provide for their families while simultaneously providing a masculine presence in schools (Blount, 1996), which communities believed would help their young men stay masculine and heterosexual. The financial advantages for administrators and vocational education teachers are still being implemented in today's school systems in which the administrative positions and vocational education positions

are the highest paid and dominated by men, helping to keep the dichotomy of male superiority, both in academic position and financially, and female inferiority securely in place.

Throughout the coming decades, more advances in psychology made the public acutely aware of homosexuality, and many school boards would use any excuse to dismiss teachers suspected of homosexual activity (Blount, 1996). In 1978, the Briggs Initiative (Proposition 6 in California) that would require the removal of teachers for their real or perceived homosexuality was placed on the ballot. The proposition failed when 58.5% of the voters rejected the measure, but the fear of LGBTQ teachers was still clearly in existence since 41.5% voted in favor (Douglas, 1978). More recently, Kevin Kumashiro (2002) argues that LGBTQ people are still one of the most hated groups in America and that "queer sexualities continue to incite wide public panic, especially when discussed in context of schools" (p. 11). A national survey on the climate of schools during the 2006-2007 academic year found that about half of LGBT teachers felt unsafe at school (Wright, 2010). School systems mirror societal beliefs, and the bizarre idea that a teacher can change or influence a child's sexuality or gender still persists and impacts

educators with a real or perceived LGBTQ identity in negative ways throughout their careers.

Due to the stressful existence associated with being an LGBTQ educator, one would believe the topic is a part of the curriculum and instruction of teacher preparation programs. And yet, when asked directly if their teacher preparation programs explicitly included sexual orientation as a form of diversity, only 60% of program coordinators said yes (Sherwin & Jennings, 2006). Not only is the topic not being included in every teacher preparation program, but Sherwin and Jennings (2006) found that, based on the results from the questionnaire, "72.5% of programs consider sexual orientation issues as either the lowest priority or ignore the topic completely" (p.212) when compared to racial/ethnic diversity, special needs, English language learners, socioeconomic status, and gender.

Seven years after Sherwin and Jennings published their findings, Gorski, Davies, and Reiter (2013) found that the current research still points to very little curriculum or coursework that is directly aimed at LGBTQ educators in public schools. Gorski et al. (2013) found that when LGBTQ topics are included, programs have a tendency to only discuss bullying as it relates to students, not in terms of the struggles faced by both LGBTQ students and teachers.

With over 60% of LGBTQ students reporting that their teachers or other school staff make homophobic remarks or biased remarks about gender expression, clearly all future teachers need to be educated on the struggles specific to the LGBTQ population (Wimberly, Wilkinson, & Pearson, 2015), and that material needs to include more than the topic of bullying. All preservice teachers should learn to foster equity, as well as representation, and by rethinking the "norm," these future educators should more fully appreciate the diverse human population.

Teacher preparation programs, which integrate inclusive pedagogy and curricula, work to deconstruct binaries central to Western modes of meaning making, learning, teaching, and politicizing (Luhmann, 1998). As with all minority communities, the LGBTQ population can be overshadowed by the cisgendered, heterosexual majority. Any pedagogy must stress the complexities of heterosexual subjugation and LGBTQ as "other" (Rodriguez, 2007), and teachers can acknowledge LGBTQ students in numerous ways, from commenting positively about pride attire, to helping those students participate in special LGBTQ events. Teachers can create LGBTQ friendly spaces through curricula that acknowledge differences among members of the school community. Students come from many types of homes, some of

which will be comprised of LGBTQ parents and other family members, and the students themselves may identify as LGBTQ (Watson & Russell, 2015). These students will benefit from teachers who create inclusive learning environments, and in those classrooms, a teacher can "disrupt anything that ostensibly seems 'normal,' relegating it to the world of the absurd, and anything that seems peculiar becomes part of the mundane" (Anijar, 2007, p.235). In this way, students learn that diversity is natural. I will be looking in-depth at data from two high school mathematics teachers, one gay and one a lesbian, in order to better understand how they deconstruct heteronormativity in their classrooms, as well as how they promote inclusion and serve as role models for their LGBTQ students.

In a likeness to LGBTQ teachers, racially marginalized mathematics teachers can provide insight into priorities for classroom communities and pedagogy. For racially marginalized teachers, including mathematics teachers, social justice and inclusion are more likely to be important than for teachers from the white majority (Quiocho & Rios, 2000). This study aims to show those same primary concerns exist for LGBTQ teachers with regard for their LGBTQ students. For a graduate course, I completed a small case study project: five LGBTQ secondary mathematics

teachers responded to an open-ended survey, and a consistent response among the teachers was that they work to make their classrooms inclusive spaces for LGBTQ students in particular. Two out of the five respondents also specifically mentioned serving as role models for their students, which mirrors the findings by Wright and Smith (2015).

### **Role Models**

The research on the impact of teachers as role models has been plagued by confounding variables and the inability to attribute success of students to the teacher. Nevertheless, a large longitudinal study by Ehrenberg, Goldhaber, and Brewer (1995) found that although the race, ethnicity, and gender of secondary school teachers do not have a direct impact on students' learning as measured through standardized tests, teachers were more likely to subjectively give higher grades to students who had matching race, gender, and ethnicity to themselves. Dee (2004) completed a similar study and found that the race of the teacher did have an impact on student achievement as measured through an achievement test. One interpretation of these results is that the identity of the teacher is important when considered in relation to the identity of the student, which in turn leads to higher expectations and

encouragement to take more advanced courses for students whose identity matches the identity of the teacher.

Adding to those findings is a study by Mccray, Sindelar, Kilgore, and Neal (2002) that found the African-American women in their research were strongly influenced to become teachers by their former female teachers. The participants in their study pointed to their teachers as examples of how to balance a family, a career, and community involvement, all important components of how the participants viewed a successful life (Mccray et al., 2002). In particular to mathematics education, Bottia, Stearns, Mickelson, Moller, and Valentino (2015) found that the gender of high school mathematics teachers has an impact on whether or not girls pursue mathematics degrees in college. These authors argue that although females make up the majority of the teaching force, more females need to be represented in the secondary mathematics fields.

In a study specific to LGBT teachers, Wright and Smith (2015) found that many responses to an open-ended question about the consequences of being out in the school dealt with making it possible for the teachers to be supportive of LGBT students and specifically giving LGBT students "someone to turn to or a role model, and being a source of validation" (p. 402). While very few studies exist on the

impact of LGBTQ mathematics teachers on LGBTQ students, one can reasonably assume there are analogous impacts to those for race, ethnicity, and gender and that having an LGBTQ identified teacher will influence LGBTQ students to see mathematics as an important part of their future.

Therefore, understanding LGBTQ mathematics teachers as role models for students would further help make sense of the importance of LGBTQ mathematics teachers in creating an inclusive mathematics classroom.

### **Students and Learning**

Most secondary school educators believe that they have a responsibility to provide an environment that supports the ability of all students to learn and that LGBTQ students need to be free from physical and psychological abuse (Szalacha, 2003). Yet, the statistics on harassment toward students who are non-gender conforming and do not meet the norms of heterosexuality are sobering. According to the Gay Lesbian and Straight Education Network (GLSEN) Climate Survey in 2015, almost 50% of students attend schools that do not have a GSA, and "the vast majority of LGBTQ students (85.2%) experienced verbal harassment (e.g., called names or threatened) at school based on a personal characteristic, most commonly sexual orientation (70.8%) and gender expression (54.5%)" (p.xvi). As more students

belong to families comprised of LGBTQ parents, siblings, and other relatives, inclusion becomes important for more than just LGBTQ students. The 2017 GLAAD (Formerly Gay & Lesbian Alliance Against Defamation) Accelerating Acceptance Study reported that Americans' comfort level with LGBTQ people has remained flat since 2014, with approximately 31% of respondents reporting that they feel uncomfortable with LGBTQ coworkers, neighbors, and relatives. While these numbers are frightening for LGBTQ students in general, this study is focused on mathematics. The finding that LGBTQ high school students are less likely to complete Algebra II than their non-LGBTQ classmates (Wimberly et al., 2015) is particularly relevant given that algebraic understanding is gateway material to both college and a successful career (Martin, Gholson, & Leonard, 2010). Queer pedagogy, which is identity inclusive, is one way to incorporate LGBTQ students as a normal part of the diverse populations of public schools. In mathematics classrooms with queer pedagogy in action, teachers acknowledge the lack of a gender binary and are inclusive through their interactions with and in speaking about LGBTQ individuals.

In terms of mathematics education, the identity of the student will have an impact on their achievement (Boaler & Greeno, 2002; Boaler, 2000; Martin, 2012). As was

previously mentioned, girls have both achievement and confidence gaps when it comes to mathematics when compared with boys. Taking identity and intersectionality one step further, Black et al. (2010) found that the leading identity is a key factor in the way that students relate to mathematics. So with a female student, if she is able to place her mathematics scholar identity in front of her female identity, she will still find success in mathematics classrooms. The experiences of LGBTQ students are similar to those of girls in that their identity is infrequently represented in mathematics classrooms and textbooks, and they struggle through a systematic treatment of othering. If LGBTQ students have a weak mathematics scholar identity, then while they are in mathematics classrooms, the mathematics identity may never come to the forefront, which will leave those students without a connection to the material.

LGBTQ students may also have experiences closely related to those of racially marginalized groups; yet, mathematics education research has focused on marginalized groups in mathematics only in their relation to the white, cisgendered, heterosexual majority (Martin, 2012; Ogbu, 1992). Esmonde and Langer-Osuna (2013) found that the presence of diversity in a classroom gives marginalized

students resources for learning, specifically for students from historically marginalized groups that may not be able to access their greatest educational strengths in a traditional mathematics classroom. In particular, Esmonde and Langer-Osuna (2013) state that "the benefit of explicitly encouraging diversity in [this teacher's] classroom was that it allowed students to take up multiple ways of interacting with each other and the mathematics itself" (p.311). Through inclusive classroom interactions with diverse students, all students were able to engage in discourses about mathematics in ways that played to their strengths and intensified their understanding of both mathematics and each other. The use of queer pedagogy focuses on creating a classroom that highlights those diversities and includes everyone through the elimination of othering. Although it has weaknesses with respect to race and the patriarchy, the queer theory framework is specifically suited for approaching mathematics education research through a lens that does not position the marginalized groups on the opposite end of a binary from the majority. Instead, queer theory considers the marginalized groups from their own point of view and gives power to their identity, agency, and positionality within the larger mathematics community.

In the review of the literature, there is a gap in studies concerning secondary LGBTQ mathematics teachers. Queer pedagogy has only weakly been implemented in mathematics courses and creating inclusive curricula that covers algebraic concepts is an important part of giving LGBTQ students access to career success. Racially marginalized teachers have been considered in the context of their mathematics identity and their ability to serve as role models; yet, the same has not been done for LGBTQ mathematics teachers. This study aims to investigate secondary LGBTQ mathematics teachers in the areas of identity, inclusion, and serving as role models.

## **Chapter III Methodology**

### **Researcher Positionality**

I am a transman in the STEM Education PhD program at the University of Minnesota. My position in the mathematics community is one of a teacher and educational researcher who taught secondary mathematics and science for 20 years in various rural Midwestern school systems. Inservice teachers value this experience. Although I was only open with my status as a transman the last few years of my secondary mathematics teaching career, I knew I was a transman from a very early age. I grew up in a suburb of Kansas City where I completed my K-12 schooling in 1990. I attended Truman State University in Kirksville, Missouri, which is a small rural city in which I continued to reside for the duration of my secondary mathematics and science teaching career. Throughout my life in Missouri, I experienced the types of discrimination that many LGBTQ people face, including being kicked out of the "wrong" bathroom as both a child and adult. These experiences provide me with strong connections to the LGBTQ teacher community, specifically in secondary mathematics where it is easy to feel isolated. My teaching career lasted 20 years and solidified my mathematics teacher identity, and with a common awareness of the challenges faced by LGBTQ

people, secondary LGBTQ mathematics and science educators have willingly shared their experiences with me.

### **Methodology and Methods**

This research was conducted as a case study and followed the methodology proposed by Yin (2014) with the teacher as the unit of analysis. In order to create triangulation, I collected data from multiple sources: audio recorded interviews, observations, field notes, and digital photos of artifacts from the classrooms of the participants. Yin is particularly useful for my work as he argues against the dichotomization of quantitative and qualitative research methods (Yazan, 2015), which is a strong connection to the queer theory framework. I chose the method of case study as it allowed me to conduct in-depth research into two LGBTQ mathematics teachers and to describe their identities, and in particular their leading identities in their mathematics classrooms, and how those identities impact inclusion and serving as classroom role models. Spending significant time in the teachers' classrooms allowed me to witness the two mathematics teachers in their school context.

### **Participants**

The participants in the study are two high school mathematics teachers who are open with their gay and

lesbian identities in their schools. Using my personal knowledge of secondary LGBTQ mathematics educators and my resources through online groups such as the Trans Teacher Network, the American Educational Research Association (AERA) Queer Studies Special Interest Group, and the LGBTQ Research and Researchers Facebook group, I issued a call for participants who live in the Midwest. Out of the responses, I purposefully selected two teachers for the case study, Brayden and Wendy (pseudonyms). These participants were chosen by considering their willingness to participate in the data collection and their proximity to the researcher.

### **Data Collection**

#### **Methods**

The case study consisted of data collection from two high school mathematics educators who are open with their gay and lesbian identities in their schools. The two mathematics teachers participated in an audio-recorded pre-observation interview (see Appendix A and C) and a post-observation interview (see Appendix B and D), each with open-ended questions. The interviews were semi-structured to allow for a free exchange of ideas and a conversational style discourse. The pre-interviews helped me to establish the mathematics identities of the teachers and their

perceived levels of inclusion, while the post-interviews allowed me to gain explicit details into noticings I made during the observations. Along with the interviews, there were classroom observations and detailed field notes (see Appendix E for the format) for each session. There were also reflections by the researcher following each observation and digital photos of artifacts from the classrooms. All of the evidence was collected with the goal of understanding the gay and lesbian identities and the mathematics identities of each of the teachers, as well as how each teacher incorporated inclusion into the classroom and the positionality of the teacher as a role model for LGBTQ students.

### **Analysis**

The analysis of the data consisted of transcribing the interview responses, which were used in conjunction with the classroom observations, field notes including photos of the physical space, and reflections. I conducted iterative open coding (Patton, 2015). The process was inductive with the intention of finding patterns and solidifying or adjusting the importance of patterns with each iteration. Overall, I was interested in obtaining concrete examples of the intersectionality of LGBTQ identity and secondary mathematics teacher identity. I also highlighted each

teacher's ability to serve as a role model and implement inclusive curriculum and pedagogy.

During the observations, I used field notes to detail the school environment, including the actions of the teachers, the people involved in the school, and the physical space. The people involved in the school included building administrators and staff, teachers, and students. I paid special attention and noted the material presented and the interactions of the teacher with students. In particular, I focused on the type of identity the teacher was performing through their actions and decisions in their respective high school mathematics classrooms. The narrative of teacher determined the leading identity for a particular time in the classroom. For example, if the teacher was presenting an example, then the problem, along with the discussion with the students, were used to conclude the leading identity. In the case of contradictions, such as the physical placement of the Safe Zone stickers, I highlighted that as a key finding with an opportunity for further analysis.

While transcribing the interviews, I kept track of responses that were relevant to the research questions through highlights with comments on the transcription. Using these highlighted notations, I created a list of 49

original codes. As I created each code, I noted the timestamp of the transcription from which the code originated. I then used a slideshow program to create a platform in which it would be easy to move the codes. I began with ten slides - nine slides each contained five codes, and one slide contained four - which were placed in chronological order of appearance in the transcripts. I then grouped the codes together into like bundles based on the topics of the codes. Using this method, I was able to create five different bundles. Next, I looked through each bundle and was able to create three final themes from the original 49 codes: mathematics teacher identity (see Figure 4.1), LGBTQ identity (see Figure 4.2), and school environment as it pertains to both the building and mathematics classrooms (see Figure 4.3). Once I had the three themes, I organized the codes into groups within each theme based on commonalities. In the mathematics teacher identity theme, there were nine codes related to teacher identity and four codes related to mathematics identity. In the LGBTQ teacher identity theme, there were eight codes related to LGBTQ identity as it pertains to the self and six codes related to LGBTQ identity as it pertains to others. Finally, in the school environment theme, there were 14 codes related to the environment of the building

and eight codes related to the environment of the classroom.

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### Theme 1-Mathematics Teacher Identity

Teaching Leading Identity		Discomfort with Math Teacher Identity
Education First	Extracurriculars (Coaching/Sponsoring)	Math Content Knowledge
Teaching Goals	Supervisor – Brayden currently	Math Geek Assumptions
Keeping Current		Math Content
Reason for Teaching		
Teacher Goals		
Teacher Pride		

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*Figure 3.1* Mathematics Teacher Identity Theme  
 The left side of the slide is codes associated with teacher identity. The right side of the slide is codes associated with mathematics identity.

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### Theme 2-LGBTQ Identity

Identity	LGBTQ	LGBTQ Assumptions
Comfort with Gay/Lesbian Identity		Groups with Negative LGBTQ Stereotypes
Gay/Lesbian for Life		Role Model
Queer Families		Positive Interactions with Students
Coming Out		Overcoming Negative Experiences
Unhappy in Closet		Background
Being Open		

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*Figure 3.2* LGBTQ Identity Theme  
 The left side of the slide is codes associated with LGBTQ identity as it relates to self. The right side of the slide is codes associated with LGBTQ identity as it relates to others.

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### Theme 3- School Environment (Building and Mathematics Classroom)

Safe Space for Teachers	Social Justice		
Colleagues	Inclusion	School Climate	Students – Brayden trouble
Parents	Positive Feelings About Current Job		Seating Charts Safe Zone – Brayden sticker
Administrators	Discipline	Stressful Situations	Advisory/Homeroom
Student Diversity	Student Support		Group Work
Parent Teacher Conferences	School-Wide Initiatives		Curriculum
			Student Responses to LGBTQ Math Problems

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*Figure 3.3* School Environment Theme

The left side of the table is codes associated with the school building environment. The right side of the slide is codes associated with the classroom environment.

## **Chapter IV**

### **Findings**

This chapter contains the findings generated from my analysis of the data. The chapter begins with Brayden as Case 1, and then continues with Wendy as Case 2. I will cover the themes of mathematics teacher identity, LGBTQ identity, and the school environment. I will also discuss the ways in which the findings respond to the research questions.

### **Findings**

#### **Case 1: Brayden**

Brayden was born in the Midwest in a very small rural town where he lived throughout high school. He chose to stay in the Midwest for college, where he majored in mathematics. At the time of this study, Brayden identified himself as a gay, cisgendered white man. He had been teaching secondary mathematics for four years, three of those in his current school. He has a bachelor's degree in mathematics and a master's degree in education. His teaching schedule consisted of Algebra II, Dual Credit Statistics, and Dual Credit College Algebra. All of Brayden's teaching had occurred in public schools.

The school in which Brayden taught at the time of the study was located approximately 30 miles from a large urban

area in the Midwest. There were approximately 900 students in the high school. The GSA was a successful club at the school, implying there were mixed genders and sexualities among the student population. Mostly white students attended this school. Because the school was located approximately 30 miles from a major metropolitan area, some of the students came from farming families. In terms of the level of student inclusion and welcoming at the school, Brayden said, "[the students are] pretty accepting... [but] there's been incidences of probably not the best behavior [toward LGBTQ people]." Brayden believed the majority of his students respected him as a gay man. However, a few students showed behaviors that indicated they believed homosexuality to be immoral.

Brayden always wanted to be a teacher having grown up spending significant time in his mother's classroom. However, he did not know he wanted to teach mathematics until he was in college. As he was progressing through his calculus classes, he realized he had a knack for explaining difficult concepts to his fellow students, and the idea just came to him: "I was like, let's be a math major and become a math teacher."

In his first teaching position, Brayden worked in a rural school district where he "was really scared [to be

out]" because the community he was living and working in was politically conservative. Brayden went so far as to make a rule for his mathematics class that students "don't ask about [Mr. Brayden's] personal life." He felt that if he were open in the school, the entire community would treat him poorly. During this part of his teaching career, Brayden was a splitter (Connell, 2015). He was a teacher who kept his LGBTQ identity separate from his mathematics teacher identity. Brayden realized he should be teaching in a school district that would be more accepting of his gay identity rather than the current school. The following year he took a mathematics teacher position in a larger district near a large urban area in the Midwest. Thus, his gay identity would be more acceptable and less of a burden to him psychologically and professionally. Next, I examine Brayden's mathematics teacher identity and the associated findings that emerged from the data.

### **Mathematics Teacher Identity as Leading Identity**

Brayden exhibited moments of comfort and discomfort with his mathematics teacher identity. Brayden displayed comfort and confidence with his mathematics content knowledge but showed a discomfort with "mathematics geek" assumptions. Still, Brayden's mathematics teacher identity

was his leading identity while creating curricula for his courses and in the physical space of his classroom.

Brayden's mathematics teacher identity was more prominent in the physical environment of his classroom than his gay identity. As I observed his teaching, I noticed that the majority of empty space on the walls had mathematics content represented in some fashion, and one wall in particular was completely covered with potential mathematics careers (see Figure 4.1). Actuarial science, aeronautical engineering, computer science, and physics were among the careers depicted. These careers are common choices for people with mathematics degrees to explore and they give evidence of Brayden's leading mathematics identity. If Brayden's leading identity were his gay identity, he may have chosen to include some careers that require mathematics but are not as obvious, such as theater set design or fashion design. He had a relatively small section of posters on social justice. Mathematics was clearly what he wanted visitors to his classroom to notice.



Figure 4.1 Brayden's Mathematics Careers Wall

According to Brayden's response during the interview, he was acutely aware of the assumptions people made related to a person being good at mathematics. Many people associate being strong at mathematics with being fluent in arithmetic. Brayden said teachers in his school "were doing Magic Squares ... my group was like, 'we got the math teacher, let's give it to him!'" Brayden was frustrated that the teachers in his group just assumed he would be able to complete a puzzle instantly.

The teachers who worked with Brayden considered him a strong mathematics teacher in his school. For example, a colleague entered his room and stated, "This guy is one of the best we have!" Brayden attributed that distinction to himself in part because he continued to challenge himself with mathematics content. Brayden was also constantly

finding new materials for his students and making improvements in his curriculum. Brayden stated, "So, we [Brayden and a colleague] completely rewrote Algebra II curriculum for our district last year, [and] we've been building all these [cooperative learning] structures into [the curriculum] already." Strong content knowledge and writing curriculum were important aspects of mathematics teacher identity to Brayden. His confidence as a mathematician, the dominance of mathematics representation in his classroom, and his defensiveness against assumptions people made about mathematics teachers all provided evidence for mathematics teacher as Brayden's leading identity.

For Brayden, his mathematics teacher identity was his leading identity, or the identity that was most prominent in the context of the curricula he created for his courses. Brayden stated, "I always make the joke that teaching [mathematics] is more of a lifestyle than being gay." This clearly showed that he saw his mathematics teacher identity as a defining piece of who he is as a person. Brayden felt that once a person found out he was a mathematics teacher, there were assumptions and stereotypes that he would have to face. Brayden stated:

Uh, there's a lot of people that like, you know, dating or talking to parents or anything, that are like, 'you're just not what I expected for a math teacher.' Um, I think when most people think of math teacher they automatically go to Ben Stein going, 'Bueller, Bueller, Bueller.' Or, they're like the hated ones, or like, because nobody likes math, that's the general consensus to them.

Brayden was intent on revising his Algebra II and college algebra courses so that the curriculum would be more inclusive to LGBTQ and other students from marginalized groups. Yet, when I observed him teach based on his curriculum, I noticed that he mostly followed a traditional approach. For example, his students were engaged in solving mathematics problems in group settings, but the problems themselves were very standard to the Algebra II and college algebra curricula. There were problems that had students simplifying algebraic expressions and then stating the property used for the simplification, such as the distributive property. On the other hand, I observed problems in the statistics curriculum that were inclusive; an example will follow in the School Environment section. Teaching mathematics with a traditional approach puts the focus of being a

mathematician on being good at following procedures. Teaching mathematics in such a way devalues creative input into problem solving and is therefore not as inclusive as using real world problem solving or modeling. In the next section, I present Brayden's gay identity and the role his gay identity played in his mathematics classroom.

### **Gay Identity as Leading Identity**

One of the most important aspects of gay identity is the coming out process. Brayden took a relaxed approach to coming out in his current school, to his mathematics and non-mathematics colleagues and his students. Brayden came out by responding honestly when students or colleagues asked him about his weekend plans and he replied with, "oh, you know, I went to this concert with my boyfriend." Brayden did not feel that coming out would cause him harm in this school district.

However, Brayden was aware that the assumptions people made about him changed once he was out with his gay identity. Brayden in particular was very passionate when he responded to the assumptions people made when they found out he was gay, especially in terms of his masculinity:

I think worst case scenario all the time, like, I think they'll go [to effeminate stereotypes] automatically and assume every single [gay man]

stereotype about me, not that they've ever said anything, but in my mind, they're thinking, 'why is your voice higher, or why don't you ...' I clearly said on the first day of school, like, that I hate glitter, and they're like, 'Why don't you like glitter?' I hate it.

He wanted to be clear that even though he was gay, he still had strong masculine facets to his identity, such as his hatred of glitter and his low speaking voice. Brayden wanted to have the freedom to place himself into or out of social groups and pushed back against the assumptions about gay men that some people made when they learned of his gay identity.

When considering gay identity and mathematics teaching identity, Brayden fell under the category of knitter as defined by Connell (2015). Brayden combined his mathematics teacher identity with his gay identity throughout the school day. During his social interactions with administrators, colleagues, and students, Brayden's gay identity was his leading identity. With respect to his mathematics teacher identity and gay identity, Brayden stated that his gay identity "does influence my personality and influences who I am, which influences my teaching ... they're all one." Brayden's gay identity was his leading

identity in his interactions with students outside of instructional time. For example, as students entered the mathematics classroom, Brayden would occasionally mention his boyfriend while he made small talk with them. This knitting approach to his identity, where Brayden was switching between mathematics teacher identity and gay identity throughout the school day, along with the support of the school-wide communities within the school systems, made it easier for Brayden to teach with inclusive pedagogy and be out as a gay man.

However, previously Brayden had taught in a school where he was not comfortable disclosing his gay identity. Brayden stated of his first job:

[Being open with my gay identity] was something I struggled with as a [mathematics] teacher, because, like, my first year teaching I didn't tell anybody because I didn't want to be known by that label, like, 'oh, you're the gay teacher.'

Given that Brayden was a knitter, he needed to move to a new school in order to make himself comfortable being out in his professional life. Brayden was constantly switching between the leading identities of mathematics teacher and gay man, so he needed to be able to exist as a knitter in order to find comfort in his position as a mathematics

teacher. Brayden's current school allowed him that freedom, which allowed his gay identity to thrive along with his mathematics teacher identity.

### **Role Model**

Brayden did believe his gay identity played a part in his ability to serve as a role model. Brayden stated:

But like, just seeing [all of my students] change in just the span of a year and saying, 'I know I've been an influence on them,' either in their math education or, you know, as a person, um, it's just, that's why I teach.

A particular advantage for the LGBTQ students I observed in Brayden's mathematics classroom was their freedom to express their sexuality or non-binary gender without fear of defamation from peers. For example, a student stopped in to Brayden's classroom to ask him a question concerning a GSA meeting. My observation of the exchange, along with my experience as a transman, lead me to believe that the student was on the queer spectrum based on the way the student interacted with Brayden. As a member of the queer community, I know that often times queer people will acknowledge one another as belonging on the queer spectrum without explicitly naming their respective identities. Because Brayden was open with his gay identity, students

belonging to the queer spectrum did not feel the need to come out to Brayden. This type of comfort is impossible to achieve without being a part of the queer community.

In addition to the classroom, another way LGBTQ teachers can have influence as role models is to work with students during extracurricular activities. Brayden had taken on duties including supervising Student Council and sponsoring the GSA. He felt that being a part of these activities was important to the students' education and development as good citizens. He stated, "I just want to make sure, especially when I'm responsible for the kids and I'm influencing kids, I want to make sure they're getting the best education." Brayden believed that his presence as a gay mathematics teacher had a positive influence on his students' lives. In the next section, I cover Brayden's school and his mathematics classroom and the relationship to Brayden's gay identity and his mathematics teacher identity.

### **School Environment and Identity**

The last theme encompassed the school environment. Both the school-wide communities and the mathematics classrooms are important spaces for mathematics education because of the tone set for the learners (Kumashiro, 2002).

I begin with the school-wide communities and then move into the environment of the mathematics classrooms.

### **School-wide Communities**

School-wide communities included school administrators, mathematics colleagues and non-mathematics colleagues, parents, and students both in his classroom and in the school. Brayden felt completely supported by the administrators in his current teaching assignment. The principal would even come to Brayden for advice on how to create a more inclusive school environment and took time to be sure that the GSA had a place in the Homecoming Parade. Along with the administration, Brayden had support from both mathematics and non-mathematics colleagues who knew he was gay.

Brayden's mathematics colleagues were the first to know he was gay. The mathematics department as a whole was very accepting and supportive of Brayden's sexuality. As for his non-mathematics teacher colleagues, Brayden noted that when they learned that he was gay, they were "very open to the idea of [him being gay] and they're just like, 'oh, okay, that's cool.'" Brayden's interactions were not just limited to mathematics teaching and other school colleagues, but also extended to parents.

Brayden taught in a large public school, and he enjoyed when parents were happy with his work as a mathematics teacher. He stated, "It's a great place to be and a great school district ... and the parents are really supportive." A positive outlook by parents about a gay mathematics teacher was encouraging for Brayden. He said that one parent in particular said, "you're just not what I expected for a math teacher" because Brayden "[breaks] the mold and [does not] fit into any [subject area] category whatsoever." I observed and sensed from Brayden that he felt supported by parents. For example, when he recounted an interaction during a school orientation where a parent approached him and stated, "Thank you for helping my son ... he said you were the first [mathematics teacher] that explained math." This compliment "...made me [Brayden] feel really good ... it was really cool that I was able to do that [connect with that student about mathematics]." The parents that Brayden met were supportive of his gay identity.

However, some students in Brayden's current school were not supportive of a queer lifestyle. There were times when some of those outspoken students voiced their belief that homosexuality was morally wrong in such a way as to warrant disciplinary action from Brayden. Brayden said, "there [have] been incidences of ... not the best behavior

[toward LGBTQ people]." He would explicitly require students to avoid homophobic slurs and derogatory comments; but even with those rules in place, some students were openly disrespectful. A small group of students in one of his classes went so far as to commit vandalism by ripping a "Safe Zone" poster down from the wall and scattering textbooks off the bookshelf in his mathematics classroom:

Yeah, uh, well, [what was vandalized] was the Safe Zone poster. I was absent that day and they had a [substitute teacher] and ... I came back and like, the poster was ripped down and books were all over the place.

Brayden disciplined the students but still felt the students continued with their belief that his gay identity did not have a place in their school and added that even after the vandalism, "there [had] been incidences of probably not the best behavior."

Brayden's gay identity is his leading identity in his interactions with school communities outside of his mathematics curriculum. The atmosphere in his classroom is inclusive and welcoming of all students. Next, I discuss the mathematics classroom environment of Brayden's room and the ties to his mathematics identity and his gay identity.

#### **Mathematics Classroom Environment**

The environment of the mathematics classroom was focused on seating charts, group work, artifacts, and curricula. The classroom environment shows how Brayden mingled mathematics content, pedagogy, and inclusion in mathematics teaching and learning. Brayden also served as a role model by creating a classroom environment where every student had a voice. I begin with the way Brayden seated students in his classroom.

Brayden situated the student desks into pods of four. He emphasized the need to create a classroom atmosphere where all students felt free to make mistakes and grow as mathematics students. The high school Brayden worked in emphasized students knowing one another. He would assign "warm ups [that were] ... team building activities." For example, he would use students' birthdays to assign partners for a problem solving activity. Familiarity with peers enhances more inquiry and discussion-oriented engagement during mathematics learning. By utilizing those types of activities, Brayden was giving students ways to become more familiar with their classmates as individuals. Since he taught in a public school with almost 900 students, his students often did not know one another. Throughout the school year, Brayden worked hard to put students into groups that gave them a chance to use their

strengths and have their weaknesses recognized and supported for learning by peers in the group.

Another example of connection between inclusion of LGBTQ and other diversity issues in mathematics, albeit less strongly, was exhibited through the artifacts Brayden had in his mathematics classroom. Brayden's artifacts included a space for social justice posters (see Figure 4.2) and a Safe Zone sticker (see Figure 4.3). The social justice posters in Brayden's classroom were filled with quotes from Dr. Martin Luther King, Jr., and the Safe Zone sticker was located on the window near his classroom entrance. In the same way Brayden had achieved a small amount of inclusion through the posters on his mathematics classroom walls, he also achieved a small amount of inclusion through his mathematics curriculum.

Brayden indicated that he spent a meaningful amount of time writing the curricula for Algebra II, Dual Credit College Algebra, and Dual Credit Statistics. Brayden believed that statistics content offered the most opportunities to engage students in mathematics learning through problems that were specifically LGBTQ inclusive. In Algebra II and college algebra, Brayden followed a more traditional curriculum. In Algebra II, for example, Brayden said, "there is a warm up on the board when they walk in ...

we'll grade the homework...then I will go into the new lesson ... I am still pretty set on doing the old school style of lecture." The type of problems I observed for Algebra II were the simplification of algebraic expressions, solving algebraic equations, and solving algebraic inequalities. Therefore, while on occasion Brayden used algebra problems he created involving a family with either two moms or two dads, he felt that the inclusive curriculum was more explicit in statistics than in algebra. In many statistics problems, students are asked to calculate central tendencies and correlations not only for the sample,



Figure 4.2 Brayden's Social Justice Posters



*Figure 4.3* Brayden's Safe Zone Sticker

but also for disaggregated samples. This disaggregation is where students learn the variations between groups such as gender and sex or race. For example, Brayden described a project his students did in statistics and gave an example of a time a student used an LGBTQ topic:

For a final project they have to do a linear regression paper and presentation and everything. Um, and I let them choose what they want to focus on, and so one of my kids wanted to do a comparison between the number Instagram followers and the elimination on RuPaul's Drag Race.

When I observed Brayden's statistics class, unlike his Algebra II and Dual Credit College Algebra classes, I noticed that LGBTQ or diversity issues were included in the curriculum. This was most apparent when a problem was presented that included the number of people of color who were pulled over for traffic violations and how that

statistic far outnumbered the same statistic for white drivers in the same geographic location. Brayden used the statistic to lead the class in a discussion on profiling. Because in Brayden's current school there were students who believed misconceptions about racial profiling, several of the students pushed back against the idea. Eventually though, knowledge of statistics and providing tools to make sense of data made the underlying injustices clearer to the students.

### **Conclusion**

Brayden taught mathematics as an out gay man in a large public school. He created an inclusive classroom and used inclusive pedagogy throughout the time I observed his teaching. Part of that inclusive pedagogy was Brayden serving as a role model to all students, both in the mathematics classroom and beyond, through his sponsorship of Student Council and the GSA Club. Concerning his mathematics courses curricula, I observed inclusive curriculum during Brayden's statistics course; however, his Algebra II and Dual Credit College Algebra curricula were both traditional.

Because the school environment contained some students who were outspoken about their belief in the immorality of LGBTQ lifestyles, Brayden was occasionally the victim of

unfriendly actions. Brayden emphasized that the school environment was welcoming in terms of the administrators, his colleagues, and the parents with whom he interacted. Still, some students were opposed to LGBTQ people.

Next, I will present Wendy's case and cover the same three themes of mathematics teacher identity, LGBTQ identity, and school environment.

### **Case 2: Wendy**

Wendy was born in a southern state where she was raised in a religious household. Her strong connection to her religion throughout her youth led her to a teaching position in a parochial school where she taught mathematics for four years. Later, she decided to move to the Midwest, where she believed she could live her life as a lesbian more authentically. At the time of the study, Wendy identified herself as a lesbian, cisgendered white female and had been teaching secondary mathematics for 14 years, 10 in her current school. She had a bachelor's degree in mathematics and a master's degree in mathematics education. She taught Algebra II, Functions Statistics and Trigonometry, and Advanced Placement (AP) Calculus BC (this course is the equivalent of Calculus I and Calculus II in college). All of Wendy's teaching occurred in private

schools; however, the private school in which she was teaching during this study was secular.

The school where Wendy taught was located in a large urban area in the Midwest. Students had to go through an application process, including a family interview, in order to gain admission to the school. The high school had approximately 500 students. The presence of a GSA club in the school indicated that the school openly supported mixed genders and sexualities. The race of the students was mostly white, and the majority of the students lived within the city. Wendy indicated that the school was comprised of mostly politically liberal students when she stated, "you might as well have a [safe space] sticker on the door of the school ... the school has become known for ... teaching all students to embrace diversity."

Wendy realized she wanted to be a teacher in second grade when she had, "probably my first crush," on her teacher. She knew during sixth grade that she wanted to teach mathematics. Wendy said that she had always liked school and liked being at school, stating, "I liked my teachers. I felt like, I liked school, in general I liked being at school, I felt good about myself, uh, as like, someone who got good grades there was that positive reinforcement." Because school was such a positive space

for Wendy, she felt working as a teacher would give her happiness in her career. In the next section, I present the ways the data exposed Wendy's mathematics teacher identity in her personal and professional lives.

### **Mathematics Teacher Identity as Leading Identity**

Mathematics teacher identity seemed to create discomfort in Wendy because this identity mostly presented in the form of "mathematics geek" assumptions when most non-mathematics people interacted with her. Wendy's mathematics teacher identity also presented in the form of a person who had substantial mathematics content knowledge. Finally, mathematics teaching identity was a central part of who Wendy was and showed as the leading identity, especially when Wendy was creating curricula.

The analysis showed that Wendy displayed mathematics teacher identity as her leading identity, or the identity that was most prominent, in the context of the mathematics teaching and learning. Wendy talked about the fact that she often forgot that being a lesbian made her somehow different. Yet, she was aware that being a mathematics teacher made her different. This was apparent as she recounted a situation in which her wife was asking about their identities as lesbians with a school administrator. In that instance, Wendy was trying to think of a trait that

would make them "different" as a couple. During their conversation with the school administrator, Wendy's wife inquired if the school had other couples like them. Later, Wendy reflected on that conversation as such:

[A] person who I work with, so also a colleague, and we were talking, and my wife asked, she said, 'do you have many other families like us [at the school]?' And I'm wracking my brain, 'what does she mean, 'like us' ... because I teach here?' Like I just forget, I forget, at [my school] I forget that we're different.

Mathematics teacher as the leading identity for Wendy also was apparent through her comfort level with being open about teaching high school mathematics. Wendy displayed a discomfort about the stereotype assumptions non-mathematics people, like some parents, made about her. She was worried that people would assume that she was a "geek," but not in a positive way. Negative assumptions of "geekiness" about a mathematics teacher made her feel conflicted with her mathematics teacher identity in public spaces. For example, when people found out she was a high school mathematics teacher, she felt they made assumptions about her and they would assign her to the stereotypes that are associated with high school mathematics teachers. Wendy stated:

As soon as they [new people you are meeting] start to press, like, 'well what do you teach,' as soon as you say, 'math,' most of the time the response is, 'uuggghhh.' And all of [a] sudden they feel disconnected from you. They almost, it's almost like they feel like they're disappointing you by saying that they were never good at math. Every once in a while, you run into someone who says, 'I really liked math, I really liked this part and this part and this part,' but that's rarely the case. I really try to avoid full disclosure, I'd rather just leave it as, I'm a teacher.

The assumptions associated with the identity of mathematics teacher made Wendy uncomfortable, unlike her lesbian identity. Wendy clearly felt more comfortable telling people she met that she was a lesbian rather than that she was a mathematics teacher. She lived and worked with people who were comfortable around LGBTQ people. Wendy forgot that being an open lesbian made her socially different from others. However, her mathematics teacher identity made her feel so uncomfortable and feel so different that she would rather not tell people that she was a mathematics teacher.

Wendy was very aware of the assumptions people made of a person being good at mathematics. Wendy stated, "Most

people equate math to arithmetic, right, they sort of fail to see the bigger picture." For Wendy, the big picture of mathematics was proof, logic, and real world applications. She believed that the average person saw mathematics as addition, subtraction, multiplication, and division and that anyone who was good at mathematics was automatically good at those operations.

Wendy was confident that she was considered one of the best mathematics teachers in her school. This was confirmed when a colleague entered the room while we were talking. When the colleague found out why she was being interviewed he remarked, "She's the best [mathematics teacher] here." She was rewarded for her hard work with being assigned the highest-level course offered, AP Calculus BC.

Wendy's mathematics teacher identity came through in her strong sense of pride for the scores her students earned on the AP exam year after year. She shared with me the average AP score that her students earned each year. Because Wendy worked at a private school, the average AP score was used as a recruitment tool, and Wendy was proud to be able to contribute to the successful image of the school.

Her mathematics teacher identity came through in another way as well. She expressed how committed and proud

she was that she continued to challenge herself with mathematics content and continuously updated her curricula. She modified her curricula by finding challenging materials for her students each year. Strong content knowledge and writing good curricula were important aspects of mathematics teacher identity to Wendy. Her confidence as a mathematics teacher also added strength to the evidence for mathematics teacher as her leading identity.

Wendy's lesbian identity was not her leading identity while she was writing curricula for her courses, but it was an important part of how she defined herself. I cover Wendy's lesbian identity in the next section.

### **Lesbian Identity as Leading Identity**

When considering LGBTQ identity and mathematics teaching, Wendy fell under the category of knitter as defined by Connell (2015). This knitting approach to her identity, along with the support of the school-wide communities within the school systems, made it easier for Wendy to be relaxed about being a lesbian. When Wendy was at school, she rarely thought about her lesbian identity. However, her pedagogy was driven by her lesbian identity, and during social situations with other teachers, administrators, students, and staff, Wendy's lesbian identity was her leading identity.

Wendy had previously taught in a parochial school where she was not comfortable disclosing her lesbian identity, so at that time she existed as a splitter (Connell, 2015). Wendy stated of her first teaching job and how she coped with being a lesbian, "it was my first real teaching job, um, I was new to my, I was newly out of the closet [in her social groups] and I wasn't willing to risk my job." Given that Wendy was more comfortable being a knitter (Connell, 2015), she needed to move to a new high school mathematics teaching position in order to make herself comfortable being out in her professional life. The school Wendy currently worked at allowed her freedom for her lesbian identity to thrive along with her mathematics teacher identity.

Wendy came out in her school when her lesbian identity was important to the context of a given situation, both to her colleagues and her students. When Wendy discussed coming out to her students, she said, "I just, you know, first day or two I'll be telling a story and I'll just throw out there, 'oh my wife ... ' So I try to do it very casually and not make a big deal out of it." Wendy did not feel that coming out would cause her harm in her school, so she was open about her wife and family.

However, Wendy was aware that the assumptions people made about her changed once she was out as a lesbian: "... no one is that objective ... they might say, 'it doesn't matter to me,' but ... they're going to attach some [lesbian] stereotype[s]." Wendy pushed back against those stereotypes associated with her lesbian identity: "... they're going to assume that I vote Democrat. Maybe I do, maybe I don't; that I wear comfortable shoes ... which I do!"

Wendy's lesbian identity drove her pedagogy and the belief that all students should be welcomed into her mathematics classroom. When I observed Wendy interacting with her students, I noticed the comfort level of the students was high, and they were allowed to make mistakes without fear of being reprimanded in front of their peers. This type of pedagogy created a classroom atmosphere of cooperation among the students and a free exchange of ideas and possible solutions to the mathematics problems they were solving. The students' respect for Wendy was apparent and played a part in Wendy's belief that she served as a role model for all of her students.

Wendy's lesbian identity also emerged in the curriculum for her Functions Statistics and Trigonometry course. In this case, her lesbian identity came out in the form of the design of course materials to be more inclusive

of LGBTQ and race-related issues. Wendy stated, "I do a lot of extra research to try and make sure at least I'm informed, um, but the course is designed to be data driven, and it seems silly to make up data or always use sports." I give an example of the type of inclusive problems Wendy created for Functions Statistics and Trigonometry in the School Environment and Identity section. Next, I cover Wendy's drive to be a role model for all of her students.

### **Role Model**

Wendy believed her lesbian identity played a part in her ability to be a role model. Wendy stated, "I do feel like I have a little bit of an edge maybe in making them [LGBTQ students] feel welcome in a place maybe, or not necessarily, someone they can at least relate to having a similar life experience." There were several LGBTQ students in the mathematics classes that I observed Wendy teaching. The LGBTQ students appeared very comfortable in her mathematics classroom, and those relationships were important to Wendy:

[My job as a mathematics teacher] is to get to know [students] and be nice to them ... where there's queer kids, or any kid identifying anything other than heteronormative, cis-heteronormative ... the most effective way to do that ... is through a relationship.

Wendy also served as a role model to non-LGBTQ students by being open with her lesbian identity. For some students, Wendy may be the only lesbian they know or interact with on a regular basis. By sharing her personal life with her students, Wendy normalizes lesbian relationships and LGBTQ families.

Now I present my findings connected to the school environment, including Wendy's mathematics classroom space. I also highlight her inclusive curriculum through an observed example from her statistics course.

### **School Environment and Identity**

For Wendy I cover both the school-wide communities and the mathematics classroom within the school environment theme. The school-wide communities cluster consisted of individuals and groups such as mathematics and non-mathematics colleagues, parents, administrators, and students in her classroom and school. The mathematics classroom cluster focused on seating charts, group work, artifacts, and mathematics curricula. I begin with the school-wide communities and then move into the environment of the mathematics classroom.

#### **School-wide Communities**

The school-wide communities focused specifically on administrators, mathematics and non-mathematics colleagues,

parents, and students in Wendy's classes as well as in the school. Wendy had positive experiences with her school-wide community at her current school and was very comfortable being open with her lesbian identity. Wendy stated, "It doesn't bother me [for parents to know I'm a lesbian] ... I feel totally supported [by the school administrators]."

However, Wendy understood that not all schools were accepting of her lesbian identity. For example, in her first school, she would not have taken a chance to be open about her lesbian identity, as that was not a physically and mentally safe place for her. Wendy previously worked at a parochial school where she was a splitter (Connell, 2015), and "super closeted," keeping her lesbian identity completely secret from her school community. She made sure to dress in a feminine manner, avoided discussions with students that were outside of the mathematics content, and kept her personal life away from administrators and colleagues.

The administrators at the school where Wendy taught during the study were very accepting of her lesbian identity. Wendy felt so comfortable at her school that she came out to the administrator who was interviewing her for the mathematics teaching position, describing, "I [felt] totally supported ... when I interviewed here, I mean it's

illegal, for a, in an interview for a potential employer to ask you your orientation, and I knew that they wouldn't and so I offered it up."

The inclusive environment of Wendy's school made for a good experience for her. In a positive manner, she stated of her mathematics and non-mathematics colleagues, "everybody [was] extremely innovative and sees themselves as an important part, not only of liberal arts education ... [shaping students to be] good communicators, confident in themselves, just developing [students] as well rounded people." Not only did Wendy feel supported by her mathematics and non-mathematics colleagues, but she felt supported by the parents of her students also.

When Wendy interacted with parents, she felt especially supported because, at her school, the success of the student was considered a team effort among students, parents, and teachers. Her current school assigned recruitment responsibilities to Wendy. The prospective parents were given Wendy's educational credentials, including her degrees and years of teaching, as well as the average AP Calculus BC scores her students earned. Because the administration was comfortable with Wendy's sexuality, Wendy was an important part of the school's message of diversity and inclusion. The support of parents is

extremely important in terms of LGBTQ teachers. Because parents are keen on what their children learn both in school and socio-culturally, it was very important that the parents supported Wendy as a lesbian mathematics teacher. Wendy would contact the parents ahead of a meeting to give them an idea of what to expect about their child and their mathematics performance. Wendy stated:

And just to be kind, but also honest ... I always send an email ahead of time to the parents giving them a head's up...even the tough ones went pretty well as far as, 'hey, let's hammer out some sort of a plan for what it's going to take to get [the student] back on track.'

The students in Wendy's school came to parent teacher conferences, reinforcing a strong connection among the parents, students, and Wendy. Wendy shared, "students show up to their conferences ... students come with parents."

The students, working together with their parents and Wendy, provided evidence for their acceptance of Wendy as a lesbian mathematics teacher. Wendy afforded opportunities for students to learn mathematics. Because of the strong role parents play in her school, Wendy felt the need to have parental support. She was happy in this school because she believed she had that support.

According to Wendy, the students in her school were mostly politically liberal, and at times, the more politically conservative students felt silenced. There was a student in particular who she said "talked about feeling discriminated against because he was politically conservative in a school that generally [was] not." Wendy felt that as a teacher she needed all students to feel welcomed in her classroom, including the students who had belief systems that viewed LGBTQ people as immoral. However, in her school, Wendy never felt as if her students were not supportive of her lesbian identity.

According to Wendy, a supportive school environment was key to her ability to feel safe in her position. As Wendy was a knitter, in order for her to stay in her job, she had to be comfortable being open with her lesbian identity. Supportive colleagues, administrators, parents, and students are especially important for knitters to maintain positive attitudes in their classrooms. Classroom environment will be explored in the next section.

## **Mathematics Classroom Environment**

Not only were school-wide communities an important theme, but the environment of the classroom was as well. In this section I focus on the seating charts, the group work, the artifacts, and the mathematics curricula that Wendy implemented. Wendy believed she had created a classroom where all students would feel welcomed.

Wendy's classroom was arranged to maximize group interactions, and I observed her use group work as an effective pedagogy in the majority of her days teaching mathematics. Wendy was able to utilize two-person tables arranged in pairs with the occasional chair at the end to create groups that had four or five students each. As for a seating chart, Wendy allowed her students to choose their own seats. Since students were likely to know one another better because of the small student body (500 students in total), social interactions in groups were more productive when students were allowed to choose where to sit. In Wendy's case, she actually collected some data to help determine whether to assign seats or let students choose. She reflected on this as follows:

Um, you know, I've solicited a lot of feedback from students throughout the years about what they feel works best for them. And it's a mixed bag. Some people

say that they feel a lot more comfortable if they get to pick who they sit with. And some students say, 'I like assigned seating because if I sit by my friends I'm distracted.' This particular year, I don't have a lot of distracted students, so I just let them pick. The walls in Wendy's room were mostly decorated in mathematics-related posters and materials. One poster listed "What Good Mathematicians Do," which offered advice related to order of operations (see Figure 4.4).

In terms of LGBTQ-friendly artifacts, Wendy stated that there was no need to have a Safe Zone sticker in her classroom because of the climate of the school. She said, "you might as well just have [a Safe Zone sticker] on the door of the school." Wendy did have pictures of her family on display but did not go out of her way to decorate with any items that were particularly LGBTQ-related. Wendy felt that she created an inclusive atmosphere in her classroom with her attention to group dynamics and her pedagogy. Next, I will discuss her use of inclusive curricula.



Figure 4.4 Wendy's What Good Mathematicians Do Poster

Wendy admitted to struggling to find specifically LGBTQ-inclusive problems for Algebra II and AP Calculus BC. For example, in AP Calculus BC, I observed the students completing multiple procedural problems on a worksheet. When the students finished the problems, they each wrote a solution, including all the steps, on the whiteboards in order to share the information with their peers. Yet, Wendy was proud of her work to find relevant data sets for inclusive problems in Functions Statistics and Trigonometry, stating:

Yeah, uh, that particular course is intended to be that way ... I do a lot of extra research to try and make sure at least I'm informed, um, but the course is designed to be data-driven, and it seems silly to make up data or always use sports, or always, you know something. So, I try to create a mix of, of kinds of

problems that we tackle so that at least once a week, if not more, a student will connect with a topic.

While observing Wendy's statistics course, I noticed that she had the students manipulate the data on a graph depicting the numbers of Confederate Statues being erected in a given year. Based on the graph, the students explored a potential relationship between the number of statues and years since the end of the Civil War. An interesting discussion took place in the statistics class where Wendy was able to point out to the students that the number of statues constructed was actually at the highest point during the Jim Crow Era (1910s-1920s) and then peaked again during the Civil Rights Movements (1950s-1960s). Once the students had finished the manipulation of the data, Wendy led a discussion about how news media can use information to support or refute given claims. The activity was an excellent example of inclusion and connection to critical thinking using statistics skills and knowledge.

#### **Summary of Wendy's Case**

Wendy's mathematics teacher identity was her leading identity when she was creating curricula. Wendy's mathematics teacher identity was also evident through her pride in the scores her students earned on the AP Calculus BC exam. Wendy was uncomfortable with the stereotypes

associated with mathematics teachers and would therefore not reveal that she was a mathematics teacher in a public space.

Wendy's lesbian identity is her leading identity in her pedagogy and in social situations at her school. Wendy strove to be a role model for all of her students. Wendy's lesbian identity was prominent in her curriculum development for her statistics course where she had inclusive data sets for students to use during analysis problems.

The private school where Wendy was teaching mathematics at the time of the study was inclusive and welcoming of all students, faculty, and staff. The school embraced diversity as a positive aspect of the school. Wendy's classroom was a welcoming space where the students showed mutual respect for one another and for Wendy.

#### **Summary of Brayden's and Wendy's Cases**

Brayden and Wendy both worked in schools with environments that were conducive to their approach of weaving their gay and lesbian identities into their professional lives as high school mathematics teachers. Brayden and Wendy taught mathematics as knitters and made their gay and lesbian identities public in their schools, and this created a more inclusive environment for all of

their students, but especially their LGBTQ-identifying students.

Brayden and Wendy had their gay and lesbian identities as their leading identities in their pedagogies and social interactions, but they had mathematics teacher identity as their leading identity in curricula creation. Brayden and Wendy considered themselves role models for their students and worked to provide opportunities for students to see them leading productive lives. Both teachers created physical spaces in their classrooms that displayed their passion for mathematics. Using inclusive pedagogy, Brayden and Wendy encouraged their students to know one another and work together on mathematics problems.

## Chapter V

### Discussion and Conclusion

This chapter will provide a synthesis of the cases of Brayden and Wendy by showing the consistencies and the differences between the two teachers. This summary will provide implications for mathematics educators and educational researchers. This chapter also includes the limitations of the study as well as possibilities for future research.

#### Discussion

This research revealed striking similarities between the teaching styles of Brayden and Wendy, including their curriculum development and pedagogical approaches to inclusion in their respective classrooms. From the findings in this research, I define pedagogical inclusion in classrooms to be demonstrated when teachers use discourses and interactions to create an atmosphere where students are seen as an integral part of the learning process and are free to make mistakes as they work through mathematics problems. Both teachers believed that their gay or lesbian identity was a part of who they were as individuals, but their mathematics teacher identity really drove the curricular decisions they made. During curriculum writing, both teachers had mathematics teacher as their leading

identity. However, when it came to pedagogy and social interactions, both teachers had their gay or lesbian identity as their leading identity and created inclusive and welcoming mathematics classrooms. As mathematics teachers, Brayden and Wendy both acted as role models for all students.

Not all school districts in the United States are inclusive of the LGBTQ population (GLAAD, 2017; GLSEN, 2015), and these teachers were well aware of that fact from their firsthand experiences. Brayden and Wendy both had positive experiences in their own schooling where they each developed a love for mathematics and decided to become a high school mathematics teacher. However, both teachers started their high school mathematics teaching careers in schools that were more welcoming of them as mathematics teachers but less welcoming of their gay and lesbian identities. While teaching mathematics in those schools, Brayden and Wendy lived as splitters, which ran counter to their notion of who they were. Neither teacher could continue to work in those unwelcoming environments, so they both moved out of their first schools and joined more supportive schools. This allowed them to teach mathematics in high schools that would welcome their gay and lesbian identities. Although there is evidence of LGBTQ teachers

working in schools that are not welcoming, the research shows that those teachers often function as splitters and remain completely closeted in their teaching positions (Connell, 2015). Additionally, the research shows that the psychological toll of being closeted negatively impacts school teachers' teaching (Connell, 2015; Jackson, 2007), and mathematics teachers like Brayden and Wendy are not immune to that. Therefore, a coping mechanism adopted by Brayden and Wendy was to leave their first school and join a different school.

Brayden and Wendy both became knitters and wove their personal lives into their own teaching (Connell, 2015). They felt comfortable doing this because they worked in high schools with welcoming environments that promoted inclusion and diversity. Although Brayden faced more negative student behaviors than Wendy, he had the support of the administration, his colleagues, and most of the parents he met. Research shows teachers who feel safe at school tend to enjoy a supportive administration and colleagues within and outside their disciplines (Connell, 2015; Jackson, 2007; Wright & Smith, 2015). Brayden and Wendy were both comfortable being open with their gay and lesbian identities in their respective school environments. Therefore, I argue that administration and colleague

support is paramount for being a successful and effective gay or lesbian high school mathematics teacher.

Despite the strong gay and lesbian identities of the two teachers, the mathematics teacher identities emerged from the data to be the focal point of Brayden and Wendy's identities. They showed this strong identity through their eagerness to emphasize how much time and effort they put into creating inclusive mathematics curricula in mathematics content areas that more organically had opportunities for inclusive pedagogies. Brayden and Wendy felt that their curricula on statistics concepts were better suited for inclusion through problem contexts and questions. The curricula for Algebra II, Dual Credit College Algebra, and AP Calculus BC were written with a focus on procedures. Yet, while teaching statistics concepts, both teachers used data sets that conveyed inclusion and diversity issues central to answering the problems. Furthermore, these problems in statistics furthered students' understanding of how data and statistical analysis aided in critical discourses belonging to inclusion and diversity. Brayden showed that in statistics, students could be encouraged to choose project topics based on their lived experiences. However, both the teachers admitted that they struggled to connect

mathematics teaching and learning to LGBTQ people in Algebra II. Brayden wrote his curriculum for Dual Credit College Algebra without extensive inclusion and for Wendy, the same was true for AP Calculus BC. Neither teacher was able to find the balance between covering the appropriate mathematics material and creating relevant problems that incorporated inclusion of LGBTQ experiences in their courses outside of statistics. Therefore, in the broader curricular contexts, both Brayden and Wendy were intentionally challenging the official curriculum (Apple, 1993) by bringing gay and lesbian contexts into statistics. Apple (1979, 1993) argues that curricula are documents generated by people in power and those curricula perpetuate dominant cultural views. The marginalization of LGBTQ issues in mathematics curricula is not just a matter of not finding an organic connection to mathematics problems, but is part of a larger discriminatory culture of the dominant group. I argue that without deliberate attempts by Brayden and Wendy to challenge the dominant narrative of mathematics culture, gay and lesbian issues would not have become parts of their mathematics pedagogy, curricula, and learning environment. These findings suggest that more mathematics teachers, especially LGBTQ-identified, deliberately need to include marginalized experiences of

LGBTQ people in the written mathematics curricula, and in the implemented curricula to recognize the LGBTQ culture.

Brayden and Wendy considered themselves role models for all of their students, including both cisgendered heterosexuals and those on the LGBTQ spectrum. The teachers believed that by being open with their gay and lesbian identities and through their sponsorship of extracurricular activities, students would see them as role models. Given the findings in research on the importance of both race and gender of teachers and the influence on students pursuing careers in mathematics (Bottia et al., 2015; Mccray et al., 2002), Brayden and Wendy serving as role models for LGBTQ mathematics students could potentially lead to more LGBTQ students interested in mathematics or mathematics-related degrees in college. However, some studies have shown the limitations of role model theory for underrepresented groups, including women and people of color. For example, in a study of influence of male and female role models Cheryan and colleagues (2011) found that the female role models did not have significant influence on female students' aspirations and beliefs in success in STEM fields. Similarly, another study (Carrington, Tymms, & Merrell, 2008) found that a teacher's gender had hardly any impact on mathematics performance or attitude towards

mathematics. Therefore, there is a cautionary note as to the extent of the positive influence of role models on LGBTQ students' mathematics achievement or aspirations.

As for the school environment of Brayden and Wendy, the physical spaces both teachers created for their students was welcoming and displayed the teachers' love of mathematics. Two key differences in the artifacts from the classrooms were that Brayden displayed Social Justice Posters and a Safe Zone sticker while Wendy did not. Both teachers used seating arrangements as a way to create student groups where communities of learners could be developed, although Brayden assigned seats to his students whereas Wendy let her students choose where to sit.

Brayden and Wendy both worked at schools where the administrators, mathematics and non-mathematics colleagues, and parents were supportive of their gay and lesbian identities. Occasionally, Brayden had to take disciplinary action against some of his outspoken students who had moral objections to homosexuality.

One unique finding in this study was that both Brayden and Wendy were considered great mathematics teachers in their respective schools. A possible reason for this distinction could be that both teachers discussed spending a large amount of time on the curriculum writing process

for all of their classes. However, another reason for the distinction could be the inclusive pedagogy both teachers implemented and the welcoming nature of their classrooms. Next, I will discuss the implications of the findings.

### **Implications**

The implications of this study are in three distinct and interrelated areas, namely inclusion, identity, and school environment. I will discuss each one of them.

#### **Inclusion**

One implication for mathematics education from these two cases is that high school-level mathematics curricula, such as Algebra II, Dual Credit College Algebra, and AP Calculus BC, may be difficult to make inclusive. Brayden and Wendy were successful teachers and both stated that they worked hard to develop their own curricula for their respective courses. Yet, the curricula I observed in Algebra II, Dual Credit College Algebra, and AP Calculus BC was traditional in the sense that the majority of the problems presented and assigned were based on developing procedures. The one course where the curriculum was inclusive was statistics, and Brayden and Wendy acknowledged that this course was more inclusive because of the mathematics teachers' ability to choose data sets and analyses that were inclusive.

Mathematics teachers could learn from the inclusive culture of the classroom created by Brayden and Wendy. I observed all of the mathematics students participating in their groups and working on the assigned problems without hesitation. In non-mathematics settings, such as passing periods, Brayden and Wendy were friendly in their interactions with all students, and the students were welcomed into their classrooms each period with a greeting. In the literature review, the inclusive nature of mathematics teachers of color was discussed (Quiocho & Rios, 2000), and it appears to be the case that Brayden and Wendy parallel racially marginalized teachers in creating inclusive spaces.

### **Identity**

Applying the framework for gay and lesbian teachers created by Connell (2015), Brayden and Wendy were both knitters and wove their personal lives into their professional lives. Brayden and Wendy accomplished knitting through their social interactions with their colleagues, both in mathematics and outside of mathematics, and their students. The leading identities of Brayden and Wendy changed depending on the situation (Black et al., 2010). When writing curricula, Brayden and Wendy had mathematics teacher as their leading identity, and with the exception

of statistics, they were both focused on helping their students to master the procedures required for problem solving. However, when given the opportunity to use inclusive data sets or allow students to choose a project topic, Brayden and Wendy both led with their gay and lesbian identities and explicitly highlighted marginalized communities. The two teachers also had gay and lesbian as their leading identities when it came to inclusive pedagogy. Brayden and Wendy created welcoming environments in their classrooms for all of their students by breaking the heterosexual norms (Kumashiro, 2001; Page, 2007; Rands, 2016) and speaking freely of their gay and lesbian lives.

Additionally, the study indicates that while mathematics identity needs to be a key idea within mathematics teacher preparation programs so that teachers can build their own sense of strong mathematics identity, other identities must be cultivated in parallel throughout the learning process. For LGBTQ teachers in particular, their LGBTQ identity should be validated by connecting the preservice teacher's mathematics identity to their LGBTQ identity through inclusion and emphasizing the intersection of both identities as being vital to becoming a successful and inclusive mathematics teacher.

### **School Environment**

One implication from this research concerning school environment is that LGBTQ students are more comfortable when they are accepted and free to live in their true identity. Through research, we know that inclusive and welcoming school environments are essential for the success of LGBTQ students (GLAAD, 2017; GLSEN, 2015; Wimberly et al., 2015). However, a dearth of research exists for LGBTQ teachers, and in particular, LGBTQ mathematics teachers. From this research, we know that Brayden and Wendy both worked in schools that were led by administrators who showed support for LGBTQ-identified people, had faculty that were accepting of Brayden and Wendy, and maintained strong GSA clubs. Brayden and Wendy were both very happy in their mathematics teaching positions, paralleling the research that shows that LGBTQ students are more successful in inclusive school environments.

In addition to the findings concerning the environment of the school building, Brayden and Wendy both created welcoming classroom environments. An implication from this finding is that LGBTQ students are more comfortable in mathematics classrooms with gay and lesbian teachers. An additional possibility is that queer pedagogy leads to the deconstruction of heterosexual norms, and this creates a more comfortable space for LGBTQ students (Kumashiro, 2001;

Page, 2007; Rands, 2016), even when the curriculum is not explicitly inclusive.

Although the implications to the study are important to mathematics education, there are some key limitations. Those will be addressed in the following section.

### **Limitations**

There are several limitations to this study. As a case study, these findings cannot be generalized to the population of LGBTQ teachers. The findings in this research are specific to Brayden as a gay high school mathematics teacher and Wendy as a lesbian high school mathematics teacher.

Another limitation appears in the form of researcher bias. While I attempted to remain objective as a researcher, I am transman who was a high school mathematics teacher for almost 20 years. During my time as a teacher, I worked hard to make my pedagogy and curricula inclusive in all my courses. During the data collection, I enjoyed watching the way LGBTQ students behaved in the mathematics classrooms of Brayden and Wendy; however, I could feel myself being disappointed when Brayden and Wendy both stated that they believed that their mathematics teacher identities were more defining for them than their gay and lesbian identities. Having mathematics teacher as their

leading identities meant that the two teachers saw the content of the mathematics courses as more important than the way the mathematics content was delivered. Mathematics teacher as leading identity appeared again in the interviews when both teachers acknowledged the lack of inclusion in the curriculum for their Algebra II courses, and for Brayden, his Dual Credit College Algebra course and for Wendy, her AP Calculus BC course. Even though they were willing to share their complete curricula with me, Brayden and Wendy both stated very early in the discussion that those courses did not contain a meaningful number of problems based on LGBTQ inclusion.

### **Future Research**

This case study leads to several questions for future research in both qualitative and quantitative areas. For instance, it would be useful to conduct a quantitative study to discover how common the overall experiences of Brayden and Wendy are in terms of feeling comfortable enough to be out in their schools. A quantitative study would also be useful for trying to determine how many LGBTQ teachers have difficulties in making subject areas outside of statistics inclusive. Finally, a quantitative study on the comfort level of LGBTQ students in mathematics

classrooms taught by LGBTQ mathematics teachers would be informative.

As for qualitative research, a case study covering a transman, transwoman, or gender non-conforming mathematics teacher and their inclusion with curriculum and pedagogy would be very informative. Another area of future qualitative research would be to explore the concept of "passing" for LGBTQ high school mathematics teachers.

Passing is a term used within marginalized communities, and it refers to the ability of a person to not be recognized as part of a marginalized group. Being able to pass gives one a significant amount of privilege because if he or she can fit into the norms without revealing their marginalized status, such as gay or lesbian, then they will not face the same hostilities a person who does not pass would face. The microaggressions faced by those who do not pass are significantly different. Passing or not passing was not included in the data collection for this research project and would be an excellent addition to the knowledge gained through this project.

### **Conclusion**

This research was conducted as a case study with the teacher as the unit of analysis. The research used the framework of queer theory to consider the implications of a

gay and lesbian teacher in breaking the heterosexual norms of high school mathematics classrooms and creating inclusive curricula and pedagogy. The study found that for these two teachers, their mathematics teacher identity is their leading identity in the physical environment of their classrooms and in their development of curricula. However, these teachers used inclusive pedagogy and created classrooms that were welcoming of all students, making their gay and lesbian identity their leading identity in their pedagogy and their relationships with students. Although both teachers created inclusive learning communities in their classrooms, their curricula were only noticeably inclusive in their statistics courses. The other courses taught, Algebra II, Dual Credit College Algebra, and AP Calculus BC, remained traditional with a focus on learning problem-solving procedures.

The two teachers served as role models for all of their students. When marginalized students see marginalized adults teaching mathematics, those students can see themselves with possible careers in mathematics-related fields (Bottia et al., 2015; Mccray et al., 2002). By being out in their schools and open with their gay and lesbian identities, the teachers helped to break the heterosexual norms associated with mathematics.

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## Appendix A

### Pre-Observation Interview

#### Brayden

- Tell me about yourself...where did you grow up? Go to school? What academic subjects did you excel in?
- Tell me about your family...do you have any siblings?
- Tell me about your journey into mathematics teaching (could you describe how you decided to become a mathematics teacher?)
  - What or who influenced your decision to become a math teacher?
    - Describe, or elaborate.
  - Did you always excel in math?
- Describe your typical teaching day.

#### Transition into the teaching career...

- How would you describe a secondary mathematics educator? (Did the person who influenced you seem to be a typical educator?)
  - How do you see yourself in that description?
  - I notice that the description is the same/different...tell me more.
- How do you see your identity as different from straight mathematics teachers?

- How does teaching mathematics impact the assumptions people make about you as a person?
  - Students, parents, administration, staff...
  - Which group do you feel is the most important? (May want to follow up on the way they respond).

#### Transition into LGBTQ...

- In general, what does LGBTQ identity mean to you? Specifically, what does gay/lesbian identity mean to you?
- When did you decide to be out in the classroom?
- How do you come out to your students each year?
- How does being out with your LGBTQ identity impact the assumptions people make about you as a person?
  - Students, parents, administrators, staff...
  - Which group do you feel is the most important? (May want to follow up on the way they respond).
- Describe how your classroom environment creates an inclusive space.
  - What do you have in your classroom that makes your space LGBTQ inclusive? Why did you choose those things?

- What do you do to be LGBTQ inclusive in your interactions with students?
  - Do you see yourself as a role model? Do your students see you as a role model?
- What do you do to be LGBTQ inclusive in your curriculum?

Looking forward to being in your classroom...is there anything specific I should expect?

## Appendix B

### Post-Observation Interview

Brayden

- Do you chaperone/sponsor student activities?
  - Which ones and why did you choose those?
- How do you come out to colleagues? What about new colleagues?
- You mentioned there were a couple of incidences with students about you being out with your gay identity. What happened and how did that impact you as a teacher?
- During the observations I noticed that you have LGBTQ friendly items (whether they have been mentioned previously or not, may give example) in your classroom.
  - What do students mention or point out about those items specifically?
  - How, if at all, do students connect those items to mathematics?
- During the observations I noticed that you have students work in groups.
  - How do you decide when students need to be in groups?

- Describe how you decide which students will work together?
- What is the purpose for your groupings?
- What is the purpose behind your group assignments?

OR

- During the observations I noticed that you have students work individually.
  - What makes you chose independent work over group work?
  - Do you always use independent work?
- How has your curriculum and pedagogy evolved throughout your career in order to create an inclusive mathematics classroom?
- How do your students respond to problems which explicitly include LGBTQ people or situations? And how do you support them?

## Appendix C

### Pre-Observation Interview

Wendy

- Tell me about yourself...where did you grow up? Go to school? What academic subjects did you excel in?
- Tell me about your family...do you have any siblings?
- Tell me about your journey into mathematics teaching (could you describe how you decided to become a mathematics teacher?)
  - What or who influenced your decision to become a math teacher?
    - Describe, or elaborate.
  - Did you always excel in math?
- Describe your typical teaching day.

Transition into the teaching career...

- How would you describe a secondary mathematics educator? (Did the person who influenced you seem to be a typical educator?)
  - How do you see yourself in that description?
  - I notice that the description is the same/different...tell me more.
- How do you see your identity as different from straight mathematics teachers?

- How does teaching mathematics impact the assumptions people make about you as a person?
  - Students, parents, administration, staff...
  - Which group do you feel is the most important? (May want to follow up on the way they respond).

#### Transition into LGBTQ...

- In general, what does LGBTQ identity mean to you? Specifically, what does gay/lesbian identity mean to you?
- When did you decide to be out in the classroom?
- How do you come out to your students each year?
- How does being out with your LGBTQ identity impact the assumptions people make about you as a person?
  - Students, parents, administrators, staff...
  - Which group do you feel is the most important? (May want to follow up on the way they respond).
- Describe how your classroom environment creates an inclusive space.
  - What do you have in your classroom that makes your space LGBTQ inclusive? Why did you choose those things?

- What do you do to be LGBTQ inclusive in your interactions with students?
  - Do you see yourself as a role model? Do your students see you as a role model?
- What do you do to be LGBTQ inclusive in your curriculum?

Looking forward to being in your classroom...is there anything specific I should expect?

## Appendix D

### Post-Observation Interview

Wendy

- Did you have Homecoming recently? How did that week go?
  - Do you try to participate in all the spirit days?
- How did parent/teacher conferences go?
- How do you come out to colleagues? What about new colleagues?
- During the observations I noticed that you have students work in groups.
  - How do you decide when students need to be in groups?
    - Describe how you decide which students will work together?
    - What is the purpose for your groupings?
    - What is the purpose behind your group assignments?
- During the observations I noticed that it seems like you have more opportunities for inclusion in your FST (functions, statistics, trigonometry) course than in the more traditional courses.
  - Do you like that about that particular course?

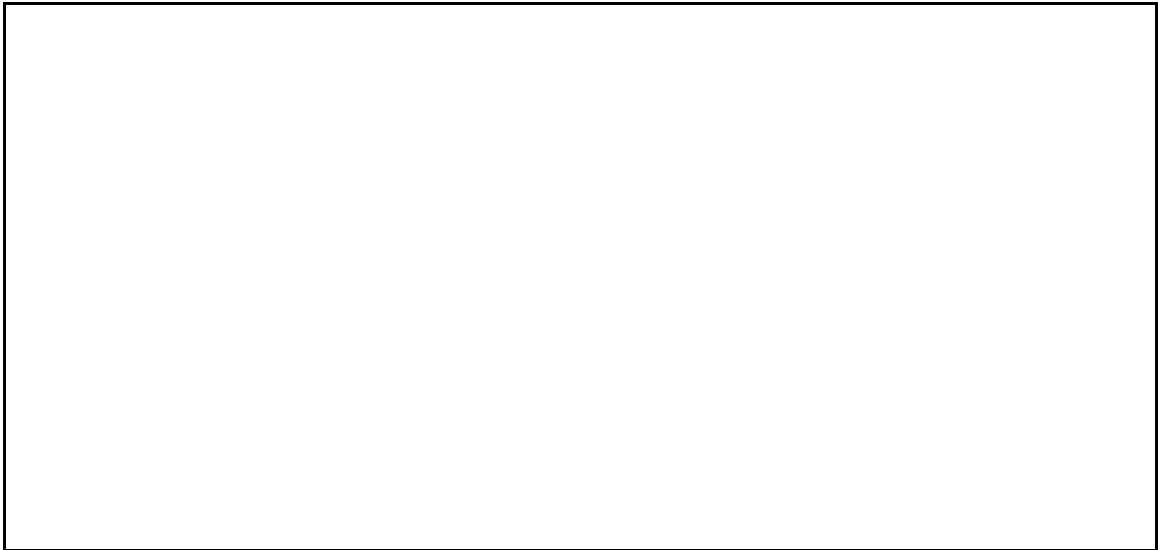
- How do the students respond to real world problems surrounding social issues like the number of monuments for Confederate leaders?
- How do your students respond to problems which explicitly include LGBTQ people or situations?  
And how do you support them?

Appendix E

Observation Field Notes Form

<b>Teacher</b>	<b>School</b>
<b>Course</b>	<b>Content</b>
<b>Date</b>	<b>Students</b>
<b>Decorations</b>	

**Classroom Map**



<b>Time</b>	<b>Notes</b>	<b>Comments</b>

Appendix F  
Code Clusters 10

**Cluster 1**

Students – Brayden trouble	Parents
Curriculum	Colleagues
Administrators	

**Cluster 2**

Inclusion	LGBTQ
Identity	Social Justice
Coming Out	

**Cluster 3**

Being Open	Role Model	Unhappy in Closet
Supervisor – Brayden currently	Background	

## Cluster 4

Math Content	Gay/Lesbian for Life	Positive Feelings About Current Job
Reason for Teaching	Schedule	

## Cluster 5

Comfort with Gay/Lesbian Identity	Discomfort with Math Teacher Identity
Queer Families	Groups with Negative LGBTQ Stereotypes
LGBTQ Assumptions	

## Cluster 6

Safe Zone – Brayden sticker	Extracurriculars (Coaching/Sponsoring)
Advisory/Homeroom	Overcoming Negative Experiences
School-Wide	

## Cluster 7

Positive Interactions  
with Students

Student Diversity

Teaching Goals

Parent Teacher  
Conferences

Student Responses to  
LGBTQ Math  
Problems

## Cluster 8

Student Support

Seating Charts

Keeping Current

School Climate

Discipline

## Cluster 9

Teacher Goals

Safe Space for  
Teachers

Group Work

Teacher Pride

Teaching Leading  
Identity

## Cluster 10

Math Content  
Knowledge

Math Geek  
Assumptions

Education First

Stressful Situations

Appendix G  
Code Clusters 5

**Cluster 1-People of the School**

Students –  
Brayden trouble

Colleagues

Parents

Administrators

**Cluster 2-School Environment**

Inclusion

School-Wide

Parent Teacher  
Conferences

Schedule

Positive Feelings About  
Current Job

School Climate

Social Justice

Student Diversity

Discipline

Curriculum

Student Support

Safe Space  
for Teachers

### Cluster 3-Classroom Environment

Being Open	Background	Student Responses to LGBTQ Math Problems
Role Model	Safe Zone	
Supervisor – Brayden currently	Advisory/Homeroom	Seating Charts
Math Content	Group Work	Stressful Situations

### Cluster 4-LGBTQ Identity

Identity	Coming Out	Positive Interactions with Students
LGBTQ	Comfort with Gay/Lesbian Identity	Overcoming Negative Experiences
Gay/Lesbian for Life		
Unhappy in Closet	LGBTQ Assumptions	
Queer Families		

### Cluster 5-Math Teacher Identity

Teaching Goals	Discomfort with Math Teacher Identity	Teaching Leading Identity
Keeping Current		
Reason for Teaching	Extracurriculars (Coaching/Sponsoring)	Math Content Knowledge
Groups with Negative LGBTQ Stereotypes	Teacher Goals	Math Geek Assumptions
	Teacher Pride	Education First

Appendix H  
Code Themes

### Theme 1-Mathematics Teacher Identity

Teaching Leading Identity		Discomfort with Math Teacher Identity
Education First	Extracurriculars (Coaching/Sponsoring)	Math Content Knowledge
Teaching Goals		
Keeping Current	Supervisor – Brayden currently	Math Geek Assumptions
Reason for Teaching		
Teacher Goals		Math Content
Teacher Pride		

### Theme 2-LGBTQ Identity

Identity	LGBTQ	LGBTQ Assumptions
Comfort with Gay/Lesbian Identity		Groups with Negative LGBTQ Stereotypes
Gay/Lesbian for Life		Role Model
Queer Families		Positive Interactions with Students
Coming Out		
Unhappy in Closet		Overcoming Negative Experiences
Being Open		Background

### Theme 3- School Environment (Building and Mathematics Classroom)

Safe Space for Teachers    Social Justice

Colleagues    Inclusion    School Climate

Parents    Positive Feelings About Current Job

Administrators    Discipline    Stressful Situations

Student Diversity    Student Support

Parent Teacher Conferences    School-Wide Initiatives

Students –

Brayden    Seating Charts  
trouble

Schedule    Safe Zone –  
Brayden sticker

Advisory/Homeroom

Group Work    Curriculum

Student Responses to  
LGBTQ Math Problems