LIFE SCIENCE TEACHERS’ DECISION MAKING
ON SEX EDUCATION

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ABSTRACT

The desires of young people and especially young bodies are constructed at the intersections of policies that set the parameters of sex education policies, the embodied experiences of students in classrooms, and the way bodies are discussed in the complex language of science. Moreover, more research points to the lack of scientifically and medically accurate information about sex education. Through this research, I hope to extend the discussion about sex education to life science classrooms, where youth can discuss how sex occurs according to scientific concepts and processes. However, science classrooms are caught in a double bind: They maintain positivist methods of teaching science while paying little attention to the nature of science or the nature and function of science that offer explanations of scientific phenomena.

In this study, I describe how science teachers made decisions about what to include or not include about sexuality in a life science classroom and the discursive frameworks that shaped these decisions. I also analyzed the ways that these relationships functioned to produce certain truths, or discourses. The current trends in research concerning SSI are pointing to understanding how controversial issues are framed according to personal philosophies, identities, and teaching approaches. If we can understand science teachers’ inner aspects as they relate to sexuality education, we can also understand the deep-seeded motivations behind how these specific issues are being taught. In science classrooms where a discussion of the body is part of the curriculum, specific discourses of the body and sex/sexuality are excluded. In this study, I describe how science teachers made decisions about what to include or not include about sexuality in a life science classroom and the discursive practices that shaped these decisions.
DEDICATION

This work is dedicated to my father, Nirmal Singh Gill, whose influence cannot be described with simple words. This work is also dedicated to my mother and my brother and Ashley, who have been my rock.
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CHAPTER 1
INTRODUCTION

There is an ongoing debate about what the content of sex education should be in schools. Research on the practices of sex education indicates that schools are falling short of offering students an education that reflects students’ sexual practices. According to the Sexuality Information and Education Council of the United States (SIECUS) a sex education law in the Southeast set the parameters for discussion of what can or cannot be said about sexuality. The code stated that any program that teaches sex education or the human reproductive process should emphasize that abstinence from sexual intercourse is the only effective means of protection against sexually transmitted infections (STI/STDs), unwanted pregnancies, and the acquired immune deficiency virus (AIDS) when it is transmitted sexually (SIECUS, 2013b).

Students, however, have sex despite these restrictions. In fact, in schools where youth took virginity pledges (youth promise to remain abstinent), young people were one third less likely to use contraceptives when they were sexually active and more likely to have engaged in oral and anal sex than nonpledgers (SIECUS, 2008). On average, according to the Centers for Diseases Control (CDC, 2012), 60% of Black students, 49% of Hispanic students, and 44% of White students had sex in 2011 (p. 24). Other researchers found that there is little research on noncoital sexual acts among students, such as oral and anal sex. In one study of teens ages 15-19, 50% have engaged in vaginal intercourse, 55% in oral sex, and 11% in anal sex (Lindberg, Jones, & Santelli, 2008).
In the Southeastern United States the statistics are more dire. Some 54% of female students and 61% of male students reported having sex, as compared to 46% nationwide. In addition, only 21% of females and 14% of males reported the use of birth control pills when they were sexually active. Moreover, in 2009, the Southeastern part of the United States ranked fifth in the country in rates of chlamydia and primary and secondary syphilis, and sixth in gonorrhea. In 2010, the rate of HIV infection among adolescents was 10.8 per 1,000 as compared to the national rate of 7.9 per 1,000. Also in 2010, the Southeast ranked 10th in the United States in rate of births (SIECUS, 2013b). Despite these distressing statistics, students in the Southeastern part of the United States do not have adequate instruction to inform an understanding of their sexual practices in a contemporary context.

For example, in 2006, in Tuscaloosa, AL, two health education teachers were placed on administrative leave because students asked questions about different acts of sex. Two representatives from the National Campaign to Prevent Teen Pregnancy were asked to speak to a Health education class of sixth-, seventh-, and eighth-grade students. During the open-question session, a student asked questions about oral sex, among other questions, The National Campaign representatives answered the questions and, parents became outraged (Jones & Jones, 2006). However, according to the director of The National Campaign, appropriate language was used, and the discussion did not get out of hand. Parents were divided because some believed the conversation was not warranted, whereas other parents believed it was a thorough coverage of the topic. The school board of education ultimately decided that this information was inappropriate because it clashed with the mandate that curriculum should be abstinence-only based.
Topics of sex education are typically covered in health education classes, although not always. According to a national survey conducted by the CDC, on average, 8 hours of instruction were devoted to topics of sex education in high school health classrooms and 6 hours in middle school classrooms (Future of Sex Education Initiative, 2012). One Southeastern representative confirmed that little time is devoted to sexuality education. In a local newspaper she stated, “In some places it’s taught in science class, in other places it’s done in health…. In some places it’s taught by the basketball coach and in some places the kids aren’t getting anything” (Lockette, 2013).

The small amount of time devoted to topics of sex education, combined with the emphasis on abstinence from sex education, leaves time for only limited discussion of topics that concern the complexity of sexuality such as how diseases are transmitted sexually and how the reproductive system functions in the act of sex. As Fine and McClelland (2006) stated, when discussions of sexuality do occur, they are based on shame and fear, and discussions of pleasure and desire are buried. For example, youth who do not understand how contraceptives function to suppress conception when sperm are present will not have faith in technologies that can inform their sexual practices. Similarly, other discussions, such as on abortion, require that students have a functional understanding of fetal development. If students are taught how Plan B or RU486 function in conjunction with knowledge of fetal development, they will be able to make more informed choices for the future. If health education classes are not providing a scientific and comprehensive education on sexuality, life science classes, on the other hand, can offer additional spaces for critical discussions that respond to the actual sexual needs and experiences of students.
Fine and McClelland (2006) have argued that the guidelines of abstinence education set up an impenetrable wall between teachers and students that reduce the likelihood that conversations will occur, thus putting young people at risk. Students, who are sexually active when given the abstinence message, feel shame about having sex before marriage. Thus, important discussions about contraceptives and engaging in sex are precluded (p. 309).

Instead of the misinformation and lack of knowledge present in abstinence education, Fine and McClelland (2006) advocated a framework of “thick desire” for youth to have lives that are full of educational and economic opportunity and the knowledge of and resources for sexual and reproductive health (p. 325). Fine and McClelland’s call for “thick desire” is being met in the development of sexuality education standards that address the social, cultural, and educational support students need. Echoing the need for a framework of social, cultural, and educational supports, the Future of Sex Education (2012) published the National Sexuality Education Standards (NSES). This report addresses the “inconsistent implementation of sexuality education nationwide and the limited time allocated to teaching the topic” (p. 6). Among the NSES objectives was to “provide a clear rationale for teaching sexuality content and skills at different grade levels that is evidence-informed, age-appropriate and theory driven” (p. 6). The theoretical framework of the NSES is a social ecological model of prevention that focuses on the community, society, individual, and interpersonal influence on people. The NSES provide guidance on the minimum core content for sexuality education in grades K-12 (Future of Sex Education, 2012). This model can be used as a foundation to discuss sexuality education because it can help local school districts develop their own curriculum based on the social and cultural contexts in which youth live.
The National Sexuality Education Standards and the thick desire framework both offer a comprehensive knowledge of sexuality education. Fine and McClelland (2006) argued for “critical sexuality studies where sexuality and reproductive struggles are linked to fights in equity, school finance, healthcare, prison reform, affirmative action and access to higher education” (p. 326). Although the National Sexuality Education Standards and the thick desire framework offer an ethical basis for general concepts that should be included in sexuality education, youth still lack critical information about sex. ISIS, a nonprofit organization that studied sexual and reproductive health education and digital media, analyzed how technology and digital media impacted sexual and reproductive health. Professional stakeholders who were interviewed stated that youth are looking for more information and guidance online, however the information is difficult to acquire. Although these stakeholders felt that students were surrounded by sex and taught about sex, misinformation still persisted, and youth continued to be unknowledgeable about the “mechanics and intricacies of the subject” (Biyar, Levine, & Zensius, 2011, p. 16). Thus, despite the ubiquitous discussion of sex, youth still lack scientific and medically accurate knowledge about the physiological processes that relate to sexuality.

Through this research, I aim to extend this argument to life science classrooms where youth can discuss how sexuality education occurs in relation to scientific concepts and processes. If students need unhindered access to educational support and health care, having a critical knowledge of their bodies is the first step, because if youth can navigate and explain the scientific language of their bodies, they will be able to make better decisions about their sexual health. If students understand the scientific processes of basic anatomy and physiology, disease transmission, ovulation, the physiological aspects of intercourse, and reproductive technologies, to name a few, then students can connect this knowledge to the context in which they live, the
support they might or might not have access to, and a future of possibility. Life science classrooms, or classrooms that provide a discussion of reproductive biology, can include the following subjects: biology, anatomy and physiology, zoology, marine biology, genetics, aquascience, and environmental science. Life science classrooms undergird a discussion of the body.

However, science classrooms are caught in a double bind. They hold onto positivistic ways of teaching science and are not critical of the nature of science, or “the nature and function of scientific knowledge,” or the epistemology of science (Borda, Burgess, Plog, Dekalb, & Luce, 2009, p.161). Although most philosophers understand science as involved in human interpretation, many students still hold a positivist view of science. According to a consensus of philosophers of science, among the most fundamental tenants of science is that society and science are intertwined and influence each other, otherwise known as the social and cultural embeddedness (p. 162). Clough (2000) also suggested that too often science instruction implies that the methodology of science results in objective knowledge about the real world (p. 14). He suggested that this may be because life science teachers have ignored the historical, philosophical and sociological foundations of science (p. 13). Clough (2000) suggested that if students can engage in science instruction they can understand scientific explanations rather than memorize scientific explanations of natural phenomena.

More recently, The National Academies of Science and the National Research Council created a framework for a new generation of science standards called A Framework for K-12 Science Education (National Research Council, 2012), also built on the promising idea of extending science to students’ experiences by science educators, curriculum developers, and state and science district supervisors, among others. In fact, they acknowledged that science
standards have become disconnected facts that are “a mile wide and an inch deep.” They stated that this type of knowledge is alienating for young people and fragments knowledge (National Research Council, 2012, p. 1). A part of their justification for the standards was that by the end of the 12th grade, students should be able to have discussions related to science related issues, to critically examine science in their everyday lives, and to continue to learn about science throughout their lifetimes (National Research Council, 2012). As a result, science education could be more responsive to issues that concern the daily experiences of students and that will affect their present and future, such as sex education.

As a former science teacher, I taught a number of life science courses, including biology, life science, advanced biology, and zoology in a middle and high school in the Southeast. In my classrooms, I knew students were having sex from the questions they asked. However, they were not sure of the correct language to use or even if a discussion concerning sex was permissible. An opportunity for discussion arose in the curriculum as we approached the anatomy and reproduction unit, so I decided to create a “sex box.” I wrote sex box on the outside of a small cardboard box and placed it on a front desk of the classroom so students were able to ask anonymous questions using language that they were most comfortable with.

The types of questions students asked concerned sexual acts, condoms, birth control, and the reproductive systems. For example, students asked whether or not they could get an STI/STD through oral sex, however they chose a different term than oral sex. I soon learned that the sex box was a convenient way for students to get the answers they needed and for me to take the students’ understanding of sex (the terms, associations, and misconceptions) and address them in a way that respected the science curriculum and their immediate needs. In other words, I was attempting to fit in a conversation about reproductive biology with sexuality in a biology
classroom. However, my decision to include this was a personal decision based on my teaching philosophy, my education, and my personal beliefs. Likewise, I wondered if other science teachers made decisions about how to structure a sex education curriculum. I also wondered how their personal decisions shaped the ways students perceived their bodies and how their perceptions affected the health and well-being of students.

**Purpose of the Study**

In this study, I describe how science teachers made decisions about what to include or not include about sexuality in a life science classroom and the discursive practices that shaped these decisions. I drew on Foucault’s (1980) conception of discourse to analyze this context. According to Foucault, discourses are expressed through the social body. Certain truths operate on the basis of discourses, which function to establish and circulate power. Thus, my focus of this study is on how discursive practices are shaped by social and cultural contexts and how these understandings intersect with the ways in which science teachers make decisions about sex education.

At one level, my research looks very similar to that of educational researcher Wanda Pillow (2004) who explored how discourses circulate in the formation of sex education policies and educational practices of teen/pregnant mothers. Whereas Pillow studied the discursive impact of teen/pregnant mothers on educational policy and educational practice options, I analyze what discourses of sexuality proliferate by examining how teachers describe their educational practices on these topics in the life science classrooms. The following questions guide this analysis:

Research Question 1: What factors influence life science teachers’ pedagogical decisions in relation to sex education?
Research Question 2: How do teachers interpret sex education in the state-mandated life science curriculum?

Research Question 3: How do teachers articulate the contradictions between what they know and what they are allowed to teach regarding sexuality in life science classrooms?

**Cultural Messages of Sex Education**

According to Fine and McClelland (2006), there are two major positions of sexuality education that affect the health outcomes of young people. Supporters of the first position are determined to provide comprehensive information about women’s bodies in order for women to make decisions regarding sexual desire, sexual agency, and understanding of sexual dangers. Supporters of the second position perceive that sexual activity is inherently dangerous, therefore they prescribe abstinence only except for adult, married, heterosexual relations. Although both positions attempt to reduce teen pregnancies, STD rates, and sexual coercion, they are distinct in the way they view women’s bodies.

According to Pillow (2004) sex education policy and practices produce discursive frameworks where sex is seen as both fear and danger. She identified these discourses as discourses of alarm (sex as dangerous/dirty), discourses of heteronormativity (marriage as the solution, the reassertion of traditional gender roles), and discourses of control (the use of Norplant). These discourses use alarmist strategies to draw attention to sex, sexual immorality, and lewdness, thus situating abstinence-only as necessary to educational practices. However, as Fine and McClelland (2006) stated, danger and pleasure are mutually involved, therefore a focus on risk alienates and distorts the complexity of human relations. Abstinence-only education falls short of offering students knowledge that attends to the reality of risk and pleasure in a discussion of sex.
**Possibilities of sexuality education in life science classrooms.** A part of the reason that sexuality education should be discussed in life science classrooms is because it offers the possibilities of going into in depth discussions. However, teachers must negotiate between their roles as science teachers and offering students critical knowledge about their bodies. Even in the space of life science classrooms, and more traditionally in the biological sciences, a discussion of reproduction has been divorced from sexuality. According to Scholer (2002), “discussion of sexuality (and especially female sexuality) is an extension of the 1960’s and 1970’s women’s movement where public discussion of sexuality was finally separated from discussion of reproduction” (pp. 76-77).

In response to this separation, a group of women met to discuss their bodies, health, and sexuality in Boston. Eventually the group developed a course about what they learned, and later the book *Our Bodies, Ourselves* was published. In the 1973 preface to *Our Bodies, Ourselves*, these women discussed how reproductive knowledge was necessary to debunking the myth that pregnancy was their destiny:

> For women throughout the centuries, ignorance about our bodies has had one major consequence: pregnancy. Until very recently pregnancies were all but inevitable, and biology was our destiny: because our bodies are designed to get pregnant and give birth and lactate, that is what all or most of us did. The courageous and dedicated work begun by people like Margaret Sanger to spread and make available birth control methods that women could use freed us from the traditional lifetime of pregnancies.
> But the societal expectation that a woman above all else will have babies does not die easily. When we first started talking to each other about this, we found that old expectations had nudged most of us into a fairly rigid role of wife-and-motherhood from the moment we were born female. Even in 1969, when we first started the work that led to this book, we found that many of us were still getting pregnant when we didn't want to. It was not until we researched carefully and learned more about our reproductive systems, about birth control methods and abortion, about laws governing birth control and abortion, and not until we put all this information together with what it meant to us to be female, that we began to feel we could truly set out to control whether and when we would have babies. (*Our Bodies, Ourselves*, 1973, Preface)
These women recognized that women needed comprehensive sex education that included reproductive biology, birth control, and abortion in order to feel in control of their bodies. Likewise, youth in schools also need a comprehensive understanding of reproductive biology and sexuality. However, the non conversation in sex education classrooms emphasizes abstinence education. Fine and McClelland (2006) called this an “impenetrable wall” or the chill, a barrier in schools to conversations specifically concerning sex stemming from abstinence-only mandates (p. 301). Even in the space of life science classrooms there is little literature that supports a discussion of sexuality. Instead, complex discussions of sexuality and reproduction, in the literature seem to be absent conversations in life science classrooms. Thus there is a corresponding need to discuss whether these conversations are happening, how they are occurring and what topics that relate to sexuality and reproduction are being discussed.

**Significance of the Study**

Among some of the most prominent problems concerning teen sex in the United States is teen pregnancy. Unfortunately, teen sexuality and teen pregnancy are treated as synonymous in federal, state, and local educational policies regarding sex education. It is because of this problem that the only response to teen sexuality is one of abstinence programs. According to Pillow (2004), young bodies are held responsible for societal sexual morality and the pregnant teen body is constructed as the site of fear, alarm, and shame with abstinence-only programs. Discussions about pregnant and teen mothers can also lead to debates about abstinence education, family structure, birth control, national morality, social welfare, and abortion. Thus, teen mothers are situated at the nexus of larger societal issues, not the social, cultural, and education supports that youth may not possess.
Because the problem of sexuality is largely associated with teenage pregnancy, sexuality and teenage pregnancy are complementary discussions. They overlap and offer similar explanations for how power circulates to produce discourses of alarm, heteronormativity and control of female bodies. My study attends to the ways that sexuality is situated in the discursive practices of life science classrooms. I also focus on the ways female sexuality is constructed, because it is a prominent discussion in teen sex, and how the local school culture and policies, such as abstinence education, affect these discourses.

**Methodology**

In order to respond to these issues, I conducted 12 interviews from 3 high schools and 2 middle schools in the Southeast. The interviews lasted from 1 to 2 hours each to explore how they addressed sexuality education. I asked teachers to explain how they defined *sex education* and how they implemented sex education in their classrooms. In order to recruit participants, I used stratified purposeful sampling to obtain teachers from a wide variety of backgrounds, ethnicities, classes, and subject specializations in life science. Currently practicing and retired teachers were necessary to this study. Teachers who had more experience have better pedagogical knowledge of topics that relate to sex education in their classes. Teachers with less experience may have different philosophies that contribute to the discussion in different ways.

I used a Foucauldian framework to analyze the ways in which power/knowledge discursive structures were present in life science classrooms and how this produced or restricted sexuality education. More specifically, I studied how power, knowledge, and resistance circulated within these discourses. According to Foucault (1980), discourses function to produce certain truths through power; we are subjected to these truths. As it concerns the concept of sex education, I studied how power and knowledge relationships were being used to produce certain
discourses, or truths, about what sex education means. I also studied the ways in which these discourses proliferated in life science classrooms by analyzing how they were deployed and resisted. The discursive practices of teachers were my units of analysis because discourses are bearers of truths and also are used to exercise power.

**Summary**

This chapter addressed the need for sex education in life science classrooms and in the Southeastern context. Despite the fact that students are having sex, they are missing discussions on healthy sexual behavior. The National Sexuality Education Standards and the framework of “thick desire” argue for functional knowledge for students. I hope to extend this conversation into life science classrooms where students can learn the basic language of sexuality. This study proposed to analyze the discourses that shape the discussions of sex education in life science classrooms. I aligned my methodology with Pillow, who analyzed the discursive formation of teen/pregnant bodies in educational policy and practice. This study was concerned with the ways discursive formations of sex education occurred in educational practices of life science classrooms. In the next chapter, I present the literature review that undergirds this study. In particular, I discuss the discursive formation of socioscientific issues in science classrooms and the current discussion of how sex education is discussed in life science classrooms.

**Definition of Terms**

*Abstinence-only education* is preferred by programs designed to promote the conservative social idea that sexual behavior is only morally appropriate in the context of a heterosexual marriage. Although these programs often replace more comprehensive sexuality education courses, they rarely provide information on even the most basic topics in human sexuality such as puberty, reproductive anatomy, and sexual health. Instead, these programs focus on the
importance of marriage and suggest that all sexual behavior outside of marriage is inevitably harmful (SIECUS, 2013a).

*Acquired Immunodeficiency Syndrome (AIDS)* is the final stage of HIV infection. People at this stage of HIV have badly damaged immune systems that put them at risk for opportunistic infections (OIs) (CDC, 2013a).

*Chlamydia* is a common sexually transmitted disease (STD) caused by a bacterium. Chlamydia can infect both men and women and can cause serious, permanent damage to a woman's reproductive organs (CDC, 2013b).

*Discourse* is a legislation or an organization based on public right (p.106). A discourse is that on which the relations of power are accumulated, circulated, and produced (Foucault, 1980, p. 93).

*Gonorrhea* is a sexually transmitted disease (STD) caused by a bacterium. Gonorrhea can grow easily in the warm, moist areas of the reproductive tract, including the cervix (opening to the womb), uterus (womb), and fallopian tubes (egg canals) in women, and in the urethra (urine canal) in women and men. The bacterium can also grow in the mouth, throat, eyes, and anus (CDC, 2013c).

*Human Immunodeficiency Virus (HIV)* is the virus that can lead to acquired immunodeficiency syndrome, or AIDS. Unlike some other viruses, the human body cannot get rid of HIV. HIV affects specific cells of the immune system, called CD4 cells, or T cells. Over time, HIV can destroy so many of these cells that the body can’t fight off infections and disease. When this happens, HIV infection leads to AIDS (CDC, 2013d).
Life science classrooms involve a discussion of reproductive biology. In the Southeastern United States, they can include the following subjects: biology, anatomy and physiology, zoology, marine biology, genetics, aquascience, and environmental science (ALEX, 2005).

Plan B refers to emergency contraception, aka Plan B and the Morning-After Pill, a highly effective method of preventing pregnancy if taken within 72 hours of unprotected sex or contraceptive failure. It has no impact on already established pregnancy (Planned Parenthood, Emergency Contraception, 2013b).

Power is “the multiplicity of force relations immanent in the sphere in which they operate and which constitute their own organization” (p.92) “the name one attributes to a strategical situation in a particular society”(Foucault, 1978, p.93).

Resistance is to play the role of adversary, target, support, or handle in power relations. These point of resistance are present everywhere in the power network (Foucault, 1978, p. 95).

RU486, the abortion pill, is a medicine that ends an early pregnancy. In general it can be used up to 9 weeks after the first day of a woman’s last period (Planned Parenthood, The Abortion Pill, 2013a).

Sexuality includes, our bodies, our sexual and reproductive anatomy, our biological sex (male, female, or intersex), our gender (being a woman, boy, girl, man, or transgender), our gender identities (our comfort with and feelings about gender), our sexual orientations (straight, lesbian, gay, bisexual), our sex drives, and our sexual identity. This definition also includes the way we experience our sexual identity, including our body image, desires, thoughts, sexual pleasure, sexual preferences, sexual dysfunction, and our values, attitudes, beliefs, and ideals about life, love, and sexual relationships, and our sexual behaviors, including masturbation. Our
sexualities are influenced by our ethical, religious, cultural, and spiritual upbringing and experience and our biology (Planned Parenthood, 2013c).

*Sexually transmitted diseases (STDs)* are caused by infections that are passed from one person to another during sexual contact. These infections often do not cause any symptoms. Medically, infections are only called diseases when they cause symptoms. That is why STDs are also called *sexually transmitted* infections. But it is very common for people to use the terms *sexually transmitted disease* or *STD*, even when there are no signs of disease (Planned Parenthood, 2013).

*Syphilis* is a sexually transmitted disease (STD) caused by a bacterium. Syphilis can cause long-term complications and/or death if not adequately treated (CDC, 2013e).
CHAPTER 2
LITERATURE REVIEW

Introduction

The purpose of this chapter is to explain the culture and politics that surround a discussion of sex education as a controversial issue in the practices of life science classrooms. The questions that guided this literature review were (1) Why do teachers incorporate socioscientific issues in their decision making process?; (2) How do science educators propose we change discussions on ethics in life science classrooms to reflect socioscientific issues?; (3) What is the absence in discussions about sexuality in life science classrooms?; and (4) How have teacher educators proposed to include sexuality education in life science classrooms?

I begin this chapter by discussing the ways in which science teachers make decisions regarding socioscientific issues. However, sex education as a socioscientific issue has not been explored. Therefore, I have also undertaken a review of the literature to investigate the ways in which life science classes include or exclude topics on sexuality education. Additionally, because topics of sex education are centered on female sexuality, as articulated by Pillow (2004), I also discuss the ways in which changing femininities affect the discussion of reproductive justice in life science classrooms.

The politics surrounding sex education is contested terrain. Since 1996, more than a $1 billion has been disseminated to states, communities, and religious organizations to implement abstinence-based education, yet scientific evidence does not support this approach (SIECUS, 2008). Most of these programs promote a religious- or morality-based education that is at odds
with the current scientific consensus. Human rights and health organizations have critiqued these programs based on scientific accuracy, withholding information about HIV, promotion of gender stereotypes, unresponsiveness to youth who are sexually active, and being inconsistent with the ethical imperatives of public health and medicine (Santelli, 2008).

**Controversial Issues in Science Education**

The suggestions offered by the National Academies of Science are easier in theory than in practice. Often, the nature of science, or the “how” of science, is not being taught. According to McComas, Almazroa, and Clough (1998), in the 1960s, there was a shift in instruction from what do scientists know to how scientists know. Philosophers like John Dewey and Charles Schwab recognized that science was about more than the acquisition of scientific knowledge; however, science curricula remain bound to communicating facts and neglect how scientists know (McComas et al., 1998). The nature of science is related to scientific literacy and encouraging science, technology, and society as a classroom approach, and this is related to understanding how scientific knowledge originated.

More recently, educational researchers have broadened this definition within a neo-Kohlbergian moral education to include emotive belief systems and character education (Witz & Lee, 2009). According to Zeidler and Nichols (2009), the “Socioscientific” framework is a theoretical model that moves beyond discussions of science, technology, and society (STS). They claim STS falls short of informing teachers about the “social development of children’s identity as part and parcel with the curriculum” (p. 50). Their two presuppositions for an SSI framework are that educational objectives should be personally relevant to students; and that “it is essential to present the humanistic face of scientific decisions about moral and ethical issues, and the arguments and evidence used to arrive at those decisions” (p. 50).
According to Lee and Witz (2009), more than 30 states have included SSI as part of the reform efforts. However, literature indicates that teachers are still following a traditional view of science, and only a small percentage is actually teaching SSI. Instead, the influences on humanistic perspectives are not being taken into account. Lee and Witz (2009) argued that top-down reform efforts that push teachers to incorporate SSI are failing. He argued that reform efforts continued to follow a traditional view of science because they failed to regard the deep rooted values and ethics that lead teachers to develop their own perspectives. Instead, teacher educators should focus on the personal beliefs, self-identities, and values and assumptions of teachers.

**Perspectives of Controversial Issues**

Educational researchers differ on how to advocate a “nature of science,” how to widen scientific literacy, and encourage science, technology, and society. Although these perspectives offer key insights into the development of pedagogical skills, they often fall short of representing the motivations of teachers.

Hodson (1999), for example, called for teachers to equip students to take action based on them being critically literate about their own educational practice; he stated that the key lies in the political development of the teacher. Teachers must understand sociopolitical action through collective action from community groups. Thus, Hodson stated it is only through mobilization of the oppressed and their collective action that change can occur. He argued that teachers are the ones who establish the criteria for the relevance of topics and therefore have ultimate authority as to what knowledge is validated and understood. Hodson stated that we need a curriculum that reveals the values and interests that have underpinned science in the past and present and that explores the ways that alternative voices may be heard. In this way, students can see how
scientific and technological knowledge and expertise are a powerful resource that is accessible to all sociocultural groups. If, for example, teachers use familiar language and vocabulary, students can see the relationship between science and the real world. They can also see how scientific knowledge complements everyday knowledge. This “cultural awareness” would include learning how to use other modes of discourse and would assist students to not be intimidated by the power inherent in that language with which they have little familiarity.

Mansour (2008) also argued that an awareness of the sociocultural context is key to understanding what factors influence teachers the most. In particular, studying beliefs and the context in which these beliefs are developed can shed light on how teaching and learning occur. Mansour stated that religious beliefs are the most influential social factor influencing teacher performance. Mansour (2008) undertook a study to determine how religion affected science teachers’ performance. He concluded that science teacher education needs to prepare teachers to be scientifically and religiously knowledgeable so they can argue any issue based on supported evidence. Thus, Mansour argued that science content can offer a great opportunity to consider values, morals, and ethics, which are that much more important when discussing controversial issues related to people’s lives, thoughts, religion, and history.

Even while the politicization of teachers and the push to understand the cultural awareness of different religions are important considerations, they are broad concepts that do not take the backgrounds, personal beliefs, and ideologies of teachers or students into account. Furthermore, the mobilization of teachers can be very different as it regards different controversial issues. For example, if teachers are not politically motivated to discuss sexuality education, they might not be willing to mobilize community groups or actively include this in their curriculum.
Other researchers do consider the specific issues that undergird a conversation about controversial issues. For example, Allchin (1999) discussed the need for the practical application of science so youth could make decisions on the basis of risk. Allchin (1999) cited that new reproductive technologies can also challenge existing meanings of parent and family. Likewise, human cloning can challenge the concept of genetic identity. Thus, if students are to understand the reasoning behind epistemic values, they should be able to question and discuss it like any scientific claim. In order to teach ethics and values, students need to be engaged in the process by exploring values and discussing them collectively. Understanding the reasoning behind epistemic values and evaluating the “risk” of controversial issues can also be important to a discussion of risk in sexuality education. Allchin moved beyond broad ideas of controversy to suggest that specific interests that involve risk and argumentation are important. Even while he discussed the importance of understanding specific controversial issues through argumentation, he fell short of considering why teachers would include these types of controversial issues in their curriculum.

Similar to Allchin, other researchers began to understand that a focus on argumentation and the nature of controversy was important. Oulton et al. (2004) suggested that understanding that the nature of controversy is at the core of all educational endeavors. In other words, the key to understanding controversy is to recognize that issues are controversial because different protagonists have different worldviews. Oulton et al. suggested a focus on discussion, rather than debate, stimulus activities, like “mind movies,” photographs, and critical incidents that can provide a basis for a class discussion. Thus, they emphasized the need to reconceptualize teaching in light of the nature of the controversy and then to develop appropriate pedagogical approaches. They believed in a socially critical approach to schooling, where schools encourage
students to reflect critically on the nature of controversial issues and for teachers to share their worldviews and to emphasize the importance of reflecting critically on their own stance.

Thus, even while argumentation was an important component, they began to realize the need for teachers to incorporate their worldviews, because they were not value-free. Other researchers realized that there was a corresponding need for teachers to have curricula and the resources in order to teach controversial issues. Levinson (2006) researched how teachers approached controversial issues in the areas of biomedicine and biotechnology and the role of evidence in their teaching. They were asked how they approached SSI issues, what they taught that related to SSI, and the impediments and opportunities related to its teaching. The most prominent theme they found from the teachers was the need for information in terms of knowledge, facts, data, and information. They also found that there were few resources that teachers drew on to explain the role of evidence and controversial issues. Thus, teachers needed models and explanations of how evidence could be used to teach controversial issues. These researchers began to focus on the role of teachers. More specifically, they argued that the ways teachers differed in their worldviews and resources affected the ways in which they taught controversial issues.

Although researchers were focusing more on the perspectives of teachers and the lack of information teachers had, there was still a shortage of understanding about the motivations of teachers and their personal ideologies concerning these controversial issues. In an effort to enlarge this understanding of controversial issues, Bell and Lederman (2001) and others began to state that it was the motivations of teachers that was fundamental to understanding their reasoning about issues that affected science, technology, and society. Bell and Lederman argued that recalling scientific theories, laws, and facts is insufficient. The nature of science is
connected to a component of democracy where people make decisions based on science- and technology-based issues.

In their study, Bell and Lederman (2001) interviewed 21 university professors to determine how they made decisions on science- and technology-based issues and their idea of the nature of science. Although the two groups interviewed had very different views on the nature of science, their decision making was primarily based on sociopolitical issues, ethics, and personal values. They concluded that additional research was needed to explore the relationship between the moral development of teachers and decision making on controversial issues.

**Socioscientific Issues in Teacher Education**

This was because personal values were much more impactful in decision making than their understanding of the nature of science. However, Zeidler & Nichols (2009) were more interested in the moral development of the child through SSI. Zeidler and Nichols stated that the SSI framework considers the moral and emotional development of the student, the moral reasoning of the child, along with the ethical dimensions of science. In this way, SSI advocates a functional scientific literacy that includes cognitive and moral development in the classroom. Zeidler and Nichols (2009) cautioned that for many new teachers, science education has been associated with indoctrination and dogmatism, and there is no place for the protection of concepts and criticism. Thus, the challenge for new science teachers is to develop the space where students can expand their personal epistemology through continued exposure to SSI and the nature of science. In this way, science teacher education can be concerned with constructing viable frameworks that teachers can utilize so students can develop functional understandings of scientific literacy.
Zeidler and Nichol’s (2009) definition of SSI, however, falls short of considering how practicing teachers think about the proposals to include SSI in their curricula. Sadler, Amirshokoohi, Kazempour, and Allspaw (2006) argued that regardless of the efforts to develop and promote SSI curricula, if classroom teachers do not adopt these suggestions for change, efforts will be largely restricted to journals and conference rooms. Instead, the extent to which SSI will be implemented depends on teachers’ beliefs and intentions. In an effort to better understand these beliefs and intentions, Sadler et al. (2006) conducted a study to determine how likely it was that teachers would teach about ethics in their curriculum. They conducted a study with 22 high school teachers to determine how they conceptualized ethics and handled these topics in their own classrooms. They created emergent profiles based on their participants’ values and ethics in science education. The ways in which these profiles handled SSI issues varied widely. Only 7 of the participants, Profile A, actively taught SSI in their classroom. Five participants in Profile B felt it was important but were constrained in the actual enactment. Five other participants, Profile C, did not see this as a priority in science and therefore might have allowed a limited discussion of SSI. Profile D comprised one individual in this sample who held the belief that science was solely about learning facts and that including ethics in science was inappropriate. Two remaining participants felt values should be important to all aspects of education.

They concluded that whereas middle school teachers felt the pressure of the state standards, they never felt inhibited by them. The high school teachers felt that the standards, accountability, and assessment were the driving forces for curricular decisions. In addition, middle school females who were life science teachers were more likely to incorporate science
and ethics, whereas male participants suggested that the application of ethics into science was needed to preserve disciplinary boundaries.

Sadler et al. (2006) also pointed to another important fact: It is difficult to encompass the beliefs of teachers without attending to the specific SSI issues and resources that teachers need. If future teachers are to be able to incorporate examples of relevant teaching in their pedagogy, they need exemplars of all the “sides” to an issue, the relevant information, resources, and the support to enact it from reform efforts. Their research holds important information for a study on sexuality education in life science classrooms. If life science teachers who are female are more likely to incorporate controversial issues, why are males less likely? What are the differences that relate to gender and teaching of controversial issues? In addition, if female middle school teachers are more likely to incorporate controversial issues than high school teachers, is this because the standards movement has prohibited this?

Other researchers have found that it is not the incorporation of the material that is important, but understanding the derived beliefs of teachers. Barrett and Nieswandt (2010) studied the decision-making ability of physics and chemistry teachers, where archetypes, instead of profiles were created for the teachers. Their research questions were the following: what beliefs do physics and chemistry teachers have about teaching ethics, what are the origins of teacher candidate’s beliefs and what is the significance of subject matter identity. Twelve teachers conducted three semi structured interviews that focused on their background, experiences, and reflections on their teaching.

They found that teachers’ commitment to teaching ethics was primarily based on their beliefs about ethics and whether or not science was value-free or not. They further stated that teachers’ commitment to teaching SSI was a derived belief, based on the subject matter and
themselves. Barrett and Nieswandt (2010) concluded that taking teacher identities into account is central to including SSI in the curriculum. Similarly, Forbes and Davis (2008) also concluded that teachers need to develop their teacher identities as part of teaching SSI instruction. They aimed to understand how teaching SSI places demands on teachers. They also asked what beliefs, knowledge, and orientations of teachers are required in order for them to support teaching SSI. Forbes and Davis found that preservice teachers perceived their role as teachers to be dominated by logic-based, rationalistic patterns, and a more value-neutral approach to teaching practice. They also concluded that teachers need to develop their own identities as professionals capable of SSI-oriented instruction.

Thus, these studies point to the need to understand how teachers’ identities develop in relation to specific controversial issues. Not only is it necessary for teachers to visualize this instruction, but their role as teachers needs to be critically evaluated to consider how they are incorporating SSI issues. The need for context specific studies could help in understanding the role of teacher identity. As it concerns sexuality education, teachers’ identities may be affected by specific social influences of the school culture and community.

Until recently, research has focused on how SSI has been incorporated into the teaching practices of science teachers. However, little research pointed to the gap between reform efforts and what is really motivating teachers to incorporate controversial issues. According to Lee and Witz (2009), only a small percentage of teachers actually incorporate SSI into their curriculum. They stated that on the surface what teachers were doing in their classroom did resonate with reform efforts. However, none of the motivations behind the teachers was actually connected to reform efforts. Their research showed that this is because teachers already have their moral and ethical values, which guide them to develop their own perspectives on teaching controversial
issues. Despite reform efforts, teachers teach based on deep rooted values and ethics. This means teachers may teach based on self-images, self-identities, and loyalties to traditional science. Thus, Lee and Witz have aimed to look at these issues from a different perspective, from the point of view of the science teacher.

Lee and Witz explained that they conducted interviews of 4 high school teachers to determine their inspirations for teaching SSI in their classrooms and to explore the disconnect in reform efforts. Lee and Witz established a relaxed atmosphere where participants shared their personal stories, values, and teaching philosophies. These researchers found that all of the teachers they interviewed followed their deeper values and ideals. Thus, they concluded that if reformers want teachers to move toward more humanistic perspectives, they should pay attention to teachers’ inner aspects or personal values and concerns. Secondly, they argued that teachers need to develop their own meaning of SSI based on their own philosophies, interests, and experiences in order to enlarge their view of science teaching.

In another analysis, Witz and Lee (2009) stated that a perspective of socialization is needed, where the teachers is an object that is subject to many forces. In addition, this needs to be complemented by an awareness of teachers’ social and educational inspiration, educational values, and commitment. From this perspective, they stated that there were two major motivations that some teachers had in connection to science: one that was “traditional,” objective, and value free, and one that was a “higher vision of science,” where they saw science as connected to stronger metaphysical, moral, and aesthetic concerns (Witz & Lee, 2009, p. 412).

Even while Witz and Lee (2009) argued that we need to understand socioscientific issues from the perspective of teachers, specific socioscientific issues such as environmental issues and sexuality education involve different curricula, resources, and standards. Thus, their analysis
could have been more rigorous if it incorporated the motivations behind teachers as it regards specific controversial issues. If teachers educators are to understand socioscientific issues, we also need to consider how specific issues are valued and discussed as they relate to the social and cultural climate of the school and the motivations behind teaching specific curricula and not others.

Thus, the current trends in research concerning SSI are pointing to understanding how controversial issues are framed according to the personal philosophies, identities and teaching approaches. These studies can have important implications for sexuality education, which is highly charged, and may involve teachers who have strong viewpoints. If we can understand science teachers’ inner aspects as they relate to sexuality education, we can also understand the deep-seeded motivations behind how these specific issues are being taught. Deep rooted ethics and values, if conducted in the manner of Witz and Lee, can take into account the socio-cultural context, the beliefs and ideologies of teachers in a much more thorough analysis of the motivations behind teaching specific issues.

**Sex Education in Life Science Classrooms**

If future efforts in research call for understanding teachers’ motivations and deep rooted ethics and values behind SSI, we must also understand how teachers’ personal values and concerns shape the teaching of SSI (Lee & Witz, 2009). If the call for teaching controversial issues means that educators must move toward understanding the deep values of science teachers, we cannot ignore that studies point to the fact that teachers need material supports as well. Sadler et al. concluded that teachers needed exemplars and relevant information and resources in order to enact reform efforts. In addition, Levinson (2006) explained that the most prominent theme they found from the teachers was the need for information in terms of
knowledge, facts, data, and information. Levinson also found that there were few resources that teachers drew on to explain the role of evidence and controversial issues.

Similarly, Forbes and Davis (2008) stated that researchers need to understand how teachers are interacting with SSI curricula in authentic classroom settings, that is, where discourse and social activity that concern socioscientific issues are not just hypothetical. If researchers are also calling for teachers to have access to information, resources and to understand how these resources are used in actual classroom settings, then there is also a corresponding need to understand what issues underlie a discussion of specific socioscientific issues. If researchers can understand the motivations that are central to specific issues, then they will also have a better understanding of the humanistic perspectives that connect to these issues. Therefore, in the following section, I discuss the specific issues in life science classrooms that relate to a discussion of sexuality.

In the first section, I explain how biologists discuss the separation of sexuality from reproduction and the possibilities for an inclusion of sexuality education that encompasses a humanistic perspective. Following this, I discuss the politics of heteronormative discourses in life science textbooks and the complications they present to a politics of “deep rooted values and ethics” and a separation of sexuality from life science classrooms. I will then discuss how curriculum masks or enables a discussion of sexuality and reproduction and how it is incorporated into systems of values. Lastly, I discuss some curricular possibilities of sexuality education.

**Biologists and the Separation of Sexuality from Reproduction**

The root of scientific thought and understanding in life science classrooms is emulated from the hard sciences. Research has shown that science teachers adhere to the traditional view
of science, where science is value-free and knowledge is pure and objective. In fact, a central experience in science is to foster the practices of the discipline and imbibe these virtues (Witz & Lee, 2009). However, biologists have called for a reexamination of the objective nature of science, one that understands the politicized nature of biotechnologies and the ethical and social implications on the bodies of women. Sidler (2009), a biologist, called for a reconceptualization of biotechnologies in science. She argued that we cannot escape our bodies even as we critique technologies that interact with them. As we challenge norms and objectivity, separating the body from nature must be exposed.

In her work, she used narratives to explain the history of science and the lived experience of the people who study science. She discussed how even a conversation of stem cells in the Christian conservative South became an emotionally charged subject, just like abortion. When her students found out more facts about stem cell research, they began to change their political opinions on the ethical issues concerning it. In this way, she situated bodies in their politicized intersections and proposed that we understand the emotional situatedness of the sciences and bring the private realm of the home into a public discussion. She explained that researching biotechnologies involved researching situated knowledge, or “celebrating and resisting scientific advances with complex, contradictory, social, political, personal, and biological spaces” (p. 217).

Furthermore, Sidler (2009) interwove communities, culture, and families into discussions in her classroom. For example, she discussed the implications of preimplementation genetic diagnosis (PGD), a “procedure where cells of in-vitro fertilized eggs are extracted and genetically tested before they are implanted in the uterus” (p. 222). This technology can be used to test for the gender of embryos and “select against some XY embryos when a strong risk for genetic disorders like hemophilia and some forms of muscular dystrophy is present” (p. 223). If,
PGD is taken a step further, Sidler reminded us, this can also be used for family planning. In Asian countries where there is a preference for boys over girls, the widespread abortion of female fetuses might be encouraged. She explained that the perspectives of students to these issues were embedded in their cultural and religious backgrounds (p. 223). Furthermore, as it concerns educators, there is an increasing need to make a feminist biopedagogy accessible to students.

Thus, Sidler explained that a discussion of topics that relate to sexuality are inherently a part of the curriculum. Likewise, the increasing call for science educators to be technologically literate includes a functional understanding of scientific literacy. This includes the cognitive and moral development of the use of cultural, discourse, and nature of science issues (Zeidler & Nichols, 2009). Likewise, reform efforts also call for an increasing attention to the students’ lives and interests in the context of technological and scientifically based issues (NRC, 2012). This call for technology could extend to discussions of contraceptives as reproductive technologies. The divide between a discussion of traditional fact-based reproduction can be filled with value-based discussions of different types of reproductive technologies including the vaginal ring, Intra-uterine devices, condoms, and other forms of birth control.

Other researchers call for a more direct inclusion of reproduction with sexuality where the discussion of the biological purpose of orgasm is rooted in biological explanations. Scholer (2002) argued that making a baby is one aspect; orgasm, hormone production, and dysfunctions are other aspects. She stated that any discussion of the reproductive system has to include the functioning of arousal and orgasm. Two biological reasons for discussing orgasm are that the “muscular contractions of the female reproductive tract (part of female orgasm) increase the speed of sperm transport through the vagina and fallopian tubes by a significant amount”
(Scholer, 2009, p. 78). Also, the biological purpose of orgasm is to increase closeness and vulnerability, a necessary component of survival of the species (p. 79). In addition, oxytocin is a hormone known to increase orgasm, a component that could be included when teaching the endocrine system. Scholer also stated that other more serious conversations of FGM (female genital mutilation) have health consequences, such as hemorrhage and scarring, and these are the effects of female cultural practices.

Sidler (2009) and Scholer (2002) offered new perspectives on how to conceptualize sex education in science classes. These examples situated science as a political activity, especially where women’s bodies were discussed. If we relate this knowledge to teachers in life science classrooms, a more critical and reflective practice can result. The motivations behind science teachers depend on understanding science through the higher vision of science. However, a distinct separation remains behind a discussion that relates to sexuality because they often involve highly charged and controversial discussions. Discussions about reproduction and sexuality, however, are important because they are inextricable from each other. A central concept of teaching socioscientific issues is to “present the humanistic face of scientific decisions about moral and ethical issues and the arguments and evidence used to arrive at those decisions” (p. 50). Teachers might see the value in discussions of FGM, the biological purpose of orgasm, stem cell research, abortion, and reproductive technologies. If science teachers can connect to humanistic orientations as it concerns their values of the curriculum, science teachers might be more willing to incorporate these issues as a regular part of their discussions.

*Heteronormative discourses in school texts.* Similarly, heteronormative discourses in science repress information that is not relevant to the lives of students. If there is an increasing call for socioscientific issues to be personally relevant and geared towards the interests of
students, then teachers humanistic orientations need to challenge heteronormative discourses. Students that are queer find little relevance to heteronormative discourses that have not challenged representations of their bodies and their sexualities. Lemke (2011) warned that students will fail to be opinion leaders in our communities because they don’t understand controversial issues. Lemke stated that textbooks are anti-intellectual because they teach students facts, not how to think. He argued that the cultural perspectives of textbooks teach male/female pairings. Furthermore, textbooks do not contain “normativity-threatening facts” and are a simplification of human sexuality (p. 288).

Other researchers, Bazzul and Sykes (2011) noted the stark absence of queer pedagogy in favor of heteronormative discourses. These researchers conducted a case study with the framework of queer theory to analyze one popular textbook, McGraw Hill’s Biology 12. The text was examined for its use of a number of common terms related to sex, including male, female, sex, estrogen, testosterone, homosexual, and heterosexual to name a few. These terms were placed into two categories of sex/gender discourse and heteronormativity.

The results of this study conclude that sex/gender binaries, basic differences between males and females, heterosexuality as the only sexuality, and rigid male/female categories in anatomy were reinforced. Also, hormonal biological determinism was found in these texts. This promotes the idea of binary sex/gender ideals or the one hormone one-sex idea, that is, estrogen and progesterone are produced by females and testosterone is produced by males. Thus, they argued that the science community needs to engage with segments of society who do not see their humanity recognized in these texts, such as people who are intersexed, transgender, or transsexual.
Similarly, Oulton et al. (2004) stated that students need to be able to explore the multiple perspectives as an essential component of teaching about controversial issues. Hodson (1999) went further to argue that science for sociopolitical action involves a critical multiculturalism for members of the mainstream culture to recognize discrimination and oppression operating in contemporary society. This undergirds the need for an antiracist education that acknowledges the role of the educational system in perpetuating inequalities based on sexual preference, race, gender, ethnicity, or class. However, Broadway (2011) argued that Bazzul and Sykes (2011) needed to move beyond adding queer into hegemonic spaces. Rather, they needed to understand curriculum as lived experience, through its historical moment, and in gendered, racialized, sexed, and classed contexts. Broadway explained, “In order to engage queer, three conceptual elements are important: explicating science as a queer curriculum; elucidating science as a form of pedagogy, specifically a queer pedagogy; and exposing science as being” (p. 295). If a queer curriculum is the conversation between the reader and the text, a queer pedagogy is how knowledge is produced in the interaction between reader, text, and teacher. Therefore, being queer is actively transforming or creating space by shattering boundaries, participating in revolutions, and sex education is the space where transformation can occur.

Thus, an education that is attentive to the “how” of science interrogates how heteronormative discourses are a historical development and how discussions of intersexed, queer sexualities are not discussed as “normal.” For example, Milne (2011) argued for a reexamination of the history of how biological knowledge evolved. She explained that the exploration of sex diversity, like the theoretical construction of homosexuality in Europe, could be a part of the cultural understandings of science. In another example she asked why the stories of Maria Patino—an athlete who was found to have an X and a Y chromosome or androgen
sensitivity syndrome—have been silenced in biology curricula? The cultural acceptance that all males have an X and a Y and all females have an X and an X is misleading. She further stated that if we understood how the X chromosome was historically discovered, we could understand that this is not the most definitive way of classifying sex. Thus, if students have this knowledge, they will be better able to engage in public discourse.

There are historical and contemporary issues that undergird a discussion of sexuality. Sexuality is infused in the science curriculum, yet only certain discourses are allowed. Thus, teachers need to be attentive to the socioscientific issues that revolve around queer sexualities. Conversely, it is important to understand teacher motivations behind a curriculum that supports heterosexuality. If we can interrogate the assumptions and beliefs behind the need to separate queer sexualities from science education, we can also understand the deep rooted ethics of teachers.

**The Enactment of Sexuality Curriculum**

Teachers beliefs and the context in which they are developed should be taken into account to understand how teaching and learning occurs (Mansour, 2008). The adoption of certain sexuality education curricula may influence the curriculum that teachers adopt in their classrooms. Stanger-Hall and Hall (2011) maintained that states that teach abstinence sexuality education may be promoting high-risk behavior because they are keeping students uneducated about reproductive knowledge. In fact, they found that the more strongly states emphasized abstinence education, the higher the teen pregnancy and birth rates. They also noted that sex education was taught under the direction of faculty who had little training in this area, and therefore they recommended that science education or even social studies education integrate an ethics and decision-making component. This might include specialized training in the areas of
reproductive biology, biology of STDs, and pregnancy and STD prevention. This study pointed to the fact that there is a growing need for teachers who are knowledgeable about the body to teach sexuality education. Thus, if the predominant push is to teach abstinence education, it is more likely that teachers will conform to these mandates. If we can better understand the contextual factors that shape the decisions teachers make, we can better understand the motivations behind teachers’ beliefs.

In addition to the type of sexuality education promoted in a particular environment, Stanger-Hall and Hall (2011) also emphasized that the difference in the type of curriculum students had was based on class and ethnicity. They found that richer states that were composed of more White students emphasized abstinence less and had lower teen pregnancy rates as compared with states with strict abstinence laws that were poor. Their study also pointed to a difference in teen pregnancy rates across ethnic groups. For 26 states in this analysis, White teens averaged 48 pregnancies per 1,000 births, Black teens averaged 103 pregnancies per 1,000 births, and Hispanic teens averaged 141 pregnancies per 1,000 births.

These findings have important implications for teachers who might teach according to racial stereotypes of who is getting pregnant and how they handle curriculum for pregnant students. Teacher motivations are complex, as are the social and cultural environments teachers live. However, if we are more attuned to the social influences on teachers, including abstinence education, we can better understand how teachers make decisions in particular areas in the United States.

Other areas show different types of sexuality education according to the context that they teach and the values they promote. For example, Bernard et al.’s (2008) study analyzed the textbooks of 16 different countries to determine if biology textbooks contributed to healthy
sexual behavior. They also wanted to study whether biology textbooks contributed to responsible attitudes about sexuality. The KVP model was used as the theoretical background for Bernard et al.’s research. The researchers assessed the interactions between scientific knowledge (K), a system of values (V), and social practices (P). The main topics they researched were the use of condoms and STIs (sexually transmitted infections). The authors concluded that there were significant interactions between social practices, values, and knowledge that determined how the content of sexuality education was presented in textbooks. For example, Bernard et al. (2008) concluded that textbooks from the areas of Senegal, France, and Tunisia were promoting a biomedical model instead of healthy sexual behavior. In addition, textbooks from Morocco and Tunisia provided examples of how traditional values were promoted along with a knowledge of prevention. The biomedical model promoted a distinct separation between reproduction and sexuality education. Instead, Finland emphasized health promotion and sex education and knowledge and literacy skills. The textbooks from Finland encouraged students to make healthy, informed choices by educating students on literacy and health. Thus, because the social practices and beliefs of Finland are different, the values of the teachers in Finland are also different.

According to Kontula (2010), in a survey administered to teachers in Finland, the most important objective for sex education was to provide students with the correct sexual facts and for students to behave responsibly including having knowledge, self-esteem, responsibility, and respect for emotions. The least favored objective was educating for sexual abstinence. Students’ test results, in a sexual knowledge test, revealed that their understanding increased considerably due to the tolerant atmosphere, more hours allocated to sex education, and the integration of sex education with biology. Finland is a good example of how reproduction and sexuality were taught in a gradual but progressive manner to students. Thus, the social practices and values
affected the scientific knowledge that the teachers in Finland adopted. However, in the study by Bernard et al. (2008), the teachers that adopted the teaching of abstinence education had high teen pregnancy and birth rates because of this socially accepted practice. It kept teens uneducated with regard to reproductive knowledge. Thus, teachers are susceptible to contextual factors that shape their decision making processes. In the following section I discuss curriculum possibilities and how some researchers argue for subversive conversations.

Sexuality and Curriculum Possibilities

The advanced model of sex education in Finland was termed sexuality and relationship education, which focused on sex education in health and biology education classes. In 2006, sex education in Finland increased in number of hours and number of students from previous years. Topics included in this curriculum were “sexual organs and functions, menstruation, ejaculation, puberty, emotional life and communication skills” (p. 379). In the eighth grade, most students learned about contraception, abortion, STIs and AIDS, intercourse, first coitus, masturbation, dating emotional life, communication skills, sexual and gender minorities, sexual vocabulary, sources of sexual knowledge, sex in the media, sexual rights, sexual harassment, and sexual legislation (Kontula, 2010). The range of topics in the sexuality and relationship education of Finland depicts how complicated a discussion of sexuality education can be. It necessarily involves relationship education because they are intricately connected.

Although teachers might not have access to resources and curricula such as those in Finland, Ivinson (2007) argued that teachers can teach these same topics in subversive ways in science classrooms. Although science is positioned within objective and linear discourses that do not value subjectivity, scientific discourses can be used to challenge prevailing myths about sexuality. She stated, for example, that students might associate the discussion of how
AIDS/HIV is transmitted with moral purity or fears about sexual practices. However, if AIDS/HIV is discussed through scientific discourses, that is, the mechanics of the condom as a barrier to disease, youth can begin to understand how disease occurs. In this way, youth can break away from myths about who is or is not prone to disease because they understand the mechanics of how disease is spread from a scientific manner.

Another way to counter myths in the representation of sexuality could be to include models of the reproductive system. Y. C. Lee (2002) argued that the representations in textbooks prohibit students from a complex understanding of their bodies. Y. C. Lee (2002) discussed how the use of a conical flask, water bottle, and boiling tube could accurately depict sexual reproduction. These simple objects that are typically in a life science classroom can be used to explain topics like contraceptives, vasectomies, birth control devices, and how the female and male reproductive systems are adapted for copulation and fertilization. Furthermore, Y. C. Lee articulated how these models could demonstrate complex concepts such as STD transmission, vasectomies, the effectiveness of condoms, and the act of intercourse. Y. C. Lee acknowledged that using models could help stimulate conversation in a nont hreatening manner about human sexuality, including promiscuity and homosexuality, and allow students to explore their values and attitudes congruent with their culture, race, sexuality, ability, and gender.

The models Lee used were an attempt to help students understand the discourses of sex education in scientific terms so they would able to understand how they function in the body. Students who can better understand these discourses will be able to apply this knowledge to their own sexual and health decisions. This study also pointed to important questions regarding what other representations teachers used other than textbook images to explain reproductive biology. A discussion of reproductive biology is not value-free, and as Sidler (2009) stated, we cannot
escape our bodies even as we critique technologies that interact with them (p. 216). How do life science teachers discuss the situatedness of bodies in students’ cultures, communities, and families? Teachers may use scientific justifications to explain topics related to sexuality. If there is a clash between ideological mandates and scientific knowledge, the decision making process of teachers can further understanding as to how this occurs. For example, what oppositional yet scientifically justifiable explanations do teachers discuss? Other important questions these studies point to are how are teachers discussing and not discussing certain topics? What is taboo and what is an allowable curriculum?

The heavy influence of the moral justifications of teaching abstinence education in the Southeast may clash with teachers’ fidelity to teaching medically accurate and scientific explanations of material. Thus, it is important to analyze how teachers decide to teach certain topics given the cultural climate. In this study, I asked how teachers negotiated their loyalty to scientific inquiry and critical reasoning in the climate of abstinence education, what their moral and personal beliefs were, and how their pedagogy was shaped by their decisions over what topics to teach.

**Changing Femininities**

In her first article Fine (1988) emphasized young people most “at risk” of victimized through disease, pregnancy, harassment and violence and by the absence of critical discussions of sex/sexuality were young females and non-heterosexual males (p. 49). She extended this argument to present day to say the missing discourse of female desire is still missing according to feminist scholars, educators, and activists (p. 298). How are feminist scholars discussing issues of reproductive justice? Has this conversation evolved with the changing of feminist
thought? Feminism plays an important role in advancing this argument and changing feminist thought may help advance this argument.

Feminist accounts of first wave feminism or “liberal feminism” played an important part in the development of science education programs by shifting the emphasis from the ways girls and minorities were inferior to the kinds of structural and institutional constraints that were barriers to women participating in science (Barton, 1998, p. 3). Therefore, they brought women into science and provided equal access, however science itself was not critiqued as a practice (p. 4). The second wave of feminism began in science education in the 1980s to the 1990s and challenged the values and standards of science education, including multiple ways of knowing, and the social, historical, and political context of science, and is therefore grounded in a social constructivist framework (p. 4). Furthermore, second wave impact has incorporated marginalized ways of knowing, such as experiences of students outside of school and traditionally female activities for a more inclusive science (p. 10).

Both first and second wave are separatist in nature, meaning they utilize differences in gender as a way of creating equality (Barton, 1998, p. 13). Third wave feminist efforts have focused on a “trifocal” lens of class, race, and gender and the tendency to essentialize these categories. Furthermore, third wave feminism moves beyond deconstruction in agency and teachers, and students are actors/agents and co-construct knowledge within a politics of location and identity (p. 15). This stance searches for ways to ground science in the embodied identities, differences, histories, and multiple narratives of schooling (p. 16). In this way, communities and science can be connected, and scientific literacy is relevant to students (p. 17). Therefore, third wave science necessitates a responsive pedagogy where students and teachers collaboratively create and analyze science in their lives (p. 17). The newest wave, then, focuses on the ability of
students themselves to co-create knowledge with teachers. Baumgardner and Richards (2001) in their Book *Manifesta* outline a 13-point agenda of third wave feminist concerns. Among these is the fight for reproductive rights, the elimination of the sexual double standard, the right to bear a child, a women’s history curriculum, support of lesbians and queer women, equal access to healthcare, and the idea that sex is related to pleasure, not just procreation, to name a few (Baumgardner & Richards, 2009, pp. 278-280).

Thus, if their femininities are changing, classrooms can respond to their needs by incorporating a curriculum that addresses students’ concerns. How do science teachers incorporate a critical understanding of the body and its cultural complexity? Even as there may be girls who are not feminists and believe anything is accomplishable, there are girls of this newest generation who argue for an education of their bodies. Are science teachers responsive to their needs?

These are important considerations in understanding how policies, healthcare, and the lives of students can be incorporated into classrooms. Yet is there a tension between students who argue for third wave rights and teachers who subscribe to first and second waves? Is the curriculum of biology classrooms supporting these concerns outlined in their *Manifesta*?
CHAPTER 3

METHODOLOGY

*What is the aim of someone who possesses power? Instead, it is the case of studying power at the point, where its intention, if it has one, is completely invested in its real and effective practices.*

—Foucault (1980, p. 97)

This chapter presents the methodological framework and approach I used to conduct this study. The first section of this chapter describes my approach using a Foucauldian framework of power/knowledge. Next, I articulate how I collected and analyzed my data and describe how the participants were selected. Lastly, I describe the demographic information and participant profiles, my positionality and my method of data analysis.

**Power and Knowledge**

Foucault (1980) studied the “how” of power as his method of analysis (p. 92). Foucault defined *power* as that which is a “relation of force” that is exercised; power only exists in action (p. 89). Power also exists in resistance; thus there is no escaping power (Foucault, 1980, p. 95). In his estimation, power produces certain truths. These truths operate on the basis of discourse, which functions to establish, implement, and circulate power. Discourses are an organization based on “public rights whose articulation is the social body” (p. 106). Thus, power is exercised through discourses. Discourses function to produce certain truths through power; we are subjected to these truths and forced to produce them (p. 93).

Likewise, I analyzed the ways in which power was resisted and re-circulated through the voices of students and teachers and how these produced certain truths or discourses. I
approached this study by exploring the ways in which power/knowledge operated within the discursive structures of teachers as they manifest themselves in the pedagogical interventions and personal belief systems regarding sexuality education for middle and high school teachers.

The discursive practices of teachers are my unit of analysis in this study because power is exercised through discourses. Foucault stated that “there can be no exercize of power without a certain economy of discourses of truth which operates through and on the basis of this association” (p. 93) The ways in which teacher develop pedagogy and explain concepts, through their language, and the social and political influence of the school environment affect how they transmit knowledge to students. Thus, the focus of this study is to analyze the discursive practices that teachers construct and negotiate in order to discuss sexuality education.

Foucault discussed power and knowledge as inseparable (Foucault, 1980). If knowledge cannot be redistributed without power and power cannot be exercised without creating knowledge, I analyzed the ways in which power and knowledge operated together. In this manner, I analyzed how the discursive practices of teachers were also an effect of power/knowledge.

Individuals are able to exercise and undergo power; thus the individual is an “effect of power” and the “vehicle of power” (p. 98). The teachers both were controlled by power and resisted power through the discourses that were circulating as a result of this control and resistance.

In order to study how power operates, the discursive practices that the teachers constructed were essential because they were an effect of power. In the life science classrooms, teachers developed their own pedagogy and functioned to utilize power to teach specific curricula and concepts and to suppress others. In other instances, this power was resisted from
teachers themselves and students. In this analysis, I aimed to understand the ways in which knowledge/power was used to inhibit conversations that involved sexuality education. Likewise, I studied the ways in which power was resisted and teachers conducted complex discussions of reproduction in conjunction with sexuality.

**Proliferative Discourses in Life Science Classrooms**

According to Foucault “sexuality is a dense transfer point for relations of power…[and is] endowed with the greatest instrumentality” (Foucault, 1978, p.103). He further stated that sexuality has formed specific mechanisms of knowledge and power in the past: the hysterization of women’s bodies, where the feminine body was “thoroughly saturated with sexuality” (p. 104), the pedagogization of children’s sex where educators, parents, and families took charge of children’s sexuality.

According to Foucault (1980) these mechanisms of knowledge and power became independent because they increased in their consistency in power and the production of knowledge. He stated that they corresponded to figures that emerged in the discussions of sex as objects of knowledge and strategies that made use of the sex of men, women, and children. In this study, and in my previous example, the abstinence education code serves as a mechanism where knowledge and power are intertwined. This mechanism is an independent unit that functions outside of the life science curriculum yet has a heavy influence on the language and ideologies in reproductive biology. The specific mandates of this code can be used to induce and repress discourses of sexuality. Likewise, the emphasis on teen pregnancy prevention situates female sexuality as a major point of concern. Female sexuality becomes the point at which power and knowledge are used to convey certain discourses. Thus, it was important to study the ways in which power and knowledge functioned as cohesive units in the formation of discourses.
Foucault (1977) described sexuality as that which is a great surface network where the “stimulation of bodies, the intensification of pleasures, the incitement to discourse, the formation of special knowledge, the strengthening of controls and resistances, are linked to one another, in accordance with a few major strategies of knowledge and power” (p. 106). Similarly, I aimed to study the ways in which sexuality multiplied and extended itself in life science classrooms. The formation of specific pedagogical skills gave way to certain discourses and methods of teaching. Some teachers developed pedagogical skills to contain and extend this discussion through abstinence language. The controlling influence of the social and cultural environment of the teachers produced discourses that conflated sexuality with racial discourses. Whereas for other teachers, the repression of a discussion of sexual orientation manifested as a object of critical inquiry in science classes. For students, a repression of sex was resisted, and they created their own discourses to explain this phenomenon, like “counting the days.” In each of these instances, power and knowledge structures were used in conjunction with one another in the proliferation of multifaceted discourses about sexuality.

**Research Questions and Goals**

The goal of this research study was to analyze the discourses that influence how life science teachers make pedagogical decisions about sex education topics in life science classrooms. Thus, the questions that guided this study were the following: What factors influence life science teachers’ pedagogical decisions in relation to sex education? How do teachers interpret sex education in state-mandated life science curricula? How do teachers articulate the contradictions between what they know and what they are allowed to teach regarding sex education in the life science classroom?
Data Collection

The site and location of the two schools were important considerations in relation to my conceptual framework. In order to understand how power relations, knowledge, and the teachers formed decisions, it was important that I conduct this study in the two school districts that were familiar to me. This topic was also a sensitive topic; therefore, I used a convenience sample. I asked teachers who were familiar to me or who were former colleagues to participate in the study.

As a former teacher in both school districts, I had access to former colleagues and their associations. I was also familiar with local politics and teachers’ personalities. I also decided to focus on these two school districts because the first school district had a variety of science teachers, ones who were more veteran and ready to retire and many who were new to the school district. The first school I chose to study was also the school where I formerly taught high school science. I chose this as a primary site of analysis because of my familiarity with it and its changing population of students and school culture. The second school site was in the same school district and was chosen because teachers in this school were recommended to me. The third site, a middle school in the city district, was chosen because I knew administrative staff, and they gave me access to the science teachers. The last school was chosen because I wanted to pick a school outside of the primary city in which I conducted the study. This school was in an extremely rural area and was very different than most of the schools in this study.

Participant Selection and Demographic Information

In this study, I conducted 12 interviews that lasted from 1 to 2 hours each. In these interviews, the participants explained how sex education was taught in the life science classroom. The teachers first defined what sex education meant to them, what concepts in the
science classroom it coincided with, and how they structured conversations on these topics. I allowed teachers to explain these major themes and then I asked subsequent questions about specific pedagogical issues and explanations of how sex education was implemented in their classrooms. The ways in which I questioned the teachers became more specific according to how each teacher incorporated issues of sex education curriculum.

In order to conduct this study, I first obtained approval from the University of Alabama Institutional Review Board (Appendix A). I utilized stratified purposeful sampling to interview 12 experienced teachers (taught for 2 or more years) and retired teachers who had taught one or more life science classes. Stratified purposeful sampling was important in this study to identify subgroups and to make it easier to compare between groups (Marshall & Rossman, 2011, p. 111). The teachers comprised a wide variety of backgrounds, ethnicities, classes, and subject specializations in life science. Retired teachers were necessary because they taught a wider variety of life science classes and were more experienced in the subjects. Teachers who have more experience have better pedagogical knowledge of topics that relate to sex education in their classes. The experienced teachers were necessary to understand how sex education was being shaped at this particular historical period.

Life science refers to any class that contains a biology component and has been authorized as a course through the Alabama course of study guidelines. This includes but is not limited to biology, advanced biology, anatomy and physiology, advanced placement biology, zoology, marine science, and environmental science. The requirement for the teachers I recruited was that they needed to have taught at least two full school years in order to have sufficient classroom experience.
One of these participants was my former biology teacher, and 5 participants were former colleagues. In order to obtain more participants, I recruited teachers using a snowball sampling. This method of recruitment yielded people most fit or “information rich” people of interest in my study (Marshall & Rossman, 2011, p. 111). The first teachers I asked to participate in this study were the teachers with the most experience and the ones who were more connected to the community. They, in turn, recommended other teachers from the same school district to participate in the study. The participants in this study varied greatly according to their experiences as life science teachers, subject matter knowledge, and knowledge of the surrounding community. The first teacher I interviewed was a veteran teacher in the city school district and taught a wide variety of life science courses.

In addition to tape-recording the interviews, I took field notes in my journal about the contextual variables of the interview, the teacher’s personality and willingness to engage in this discussion. I took field notes prior to the interview to gauge my thoughts on the participant and then wrote notes post interview to better contextualize the responses of the participants. For example, many participants discussed issues after the official interviews that were a significant determinant as to how teachers made decisions. Also, many participants had responses that they did want to provide with the tape recorder on. These conversations that took place after the “official” interview served to support the interview questions. These post interview conversations often involved a more thorough discussions about the ethical issues of sex in public schools and the larger issues of the school systems.

The participants with whom I had post interview conversations were often more experienced teachers who had a broader understanding of larger discourses that affected local discourses of education. During the transcribing and coding process, I referred to these journal
notes from before the interview and after the interview to add to my data collection. See
Appendix B and Appendix C for table of participants and questions.

**Participant Profiles**

**High School Teachers**

In the following section I give a description of the participants who were interviewed and
their corresponding high school demographic information. I have used pseudonyms for the
participants and for the schools. Five of the 12 participants were employed at Crescent High
School. These teachers, Amanda, Ann, Liz, Jessica, and Caroline, were all White female
teachers. In the school year 2012-2013, the demographic information for students who attended
Crescent High School was the following: 1% Asian females, 30% Black females, 29% Black
males, less than 1% Hispanic females, 1% Hispanic males, 19% White females, and 19% White
males. This school represented the most diverse population of the schools in this study. The free
and reduced lunch percentage was 47% in 2012-2013, and the dropout rate was 0% (ALSDE,
2013b).

Amanda, a White female in her late 50s, was the first teacher who agreed to participate in
my study. She taught life science curricula for 33 years. I interviewed Amanda for 1 hour and 20
minutes in a coffee shop near her school. I began by talking about the school and the school
culture. I then asked her if I could turn the interview tape on and ask more pointed questions
about her teaching. Among the subjects she taught were advanced placement biology, chemistry,
regular biology, anatomy and physiology, physical science, and marine biology. She also
discussed teaching on a satellite network through a distance education program, for which she
obtained 29 teaching certifications. She seemed very energetic and proud of the breadth of
courses she taught. Amanda taught at Crescent High School, as did Jessica, another participant in this study.

Jessica was a newer teacher in her early 30s with 4 years of teaching experience. At the time of her interview, Jessica was starting a new chapter in her life. She was going to be a new mother and return to school. Like Amanda, she was very eager to participate in the study. I interviewed Jessica in a coffee shop near her school area, and the interview lasted 1 and a half hours. I began by discussing her personal accomplishments, leaving teaching, and her previous teaching experiences. The conversation then evolved into a discussion about how those experiences helped her prepare for teaching at Crescent High School.

Liz, another experienced teacher of 34 years, was on the verge of retiring the following year. Liz was in her late 50s and also had only taught in the Southeastern region. During the course of this study, she taught human anatomy and physiology in Grades 9 through 12. I interviewed Liz outside of her school in a park. The interview last for approximately one hour. The interview was quick because she gave very concise and matter-of-fact answers. I asked many follow-up questions with this participant.

Ann, a middle-aged White female, was another participant from Crescent High School and had been teaching for 20 years. She taught seventh grade life science, physics, chemistry, anatomy, and physiology. She also taught mainly in the Southeast and expressed concern with issues of pregnancy and sex education in her school district. I interviewed Ann for 40 minutes. Ann gave very short and concise answers and felt uncomfortable towards the end of the interviews.

Caroline, a middle-aged White female, also taught at Crescent High School and had been teaching for 16 years. She recently made the decision to take another job at a different high
school. Her teaching experiences included advanced biology, zoology, and chemistry, advanced placement biology and anatomy and physiology. I interviewed Ann for one and a half hours. Ann became frustrated with the line of questioning during the interview process as well. Amanda, the first teacher I interviewed, and Liz recommended I interview a male high school teacher, John.

John was employed at Ridge High School and taught for 22 years. This high school represented a different demographic than Crescent high school, which was why he was recommended for the interview by the other teachers. This school was an entirely Black population of students. In the year 2012-2013, the demographic information at Ridge High School was the following: 54% Black females, 46% Black males. In this same year, 86% of the students were on free and reduced lunch, and the dropout rate was 8.4% (ALSDE, 2013b). The interview with John took approximately 2 hours. I interviewed John in the public library. John was very thorough in his responses and discussed other problems that he believed were connected to sexuality education.

Amber taught at Dover High School and was a friend I met in a graduate-level class. I asked her to participate because her school was located in an extremely rural area of the Southeast. I interviewed Amber in a coffee shop. The interview lasted approximately 2 hours. Amber was very thorough and expressed a great interest in the topic and provided a lot of additional information about teaching sexuality education in her school district. In the 2012-2013 year, the free and reduced lunch rate was 68%, and the dropout rate was 1.5%. This school was an entirely White population, and the percentages of students that attended were 47% White females and 49% White males (ALSDE, 2013a).

Amber taught science for 12 years in the subjects of earth science, life science, physical science, 9th- and 12th-grade Biology, and 9th- and 12th-grade electives of botany, zoology,
anatomy and physiology and forensic science. She was a White female in her late 30s and had only taught in the Southeast.

**Retired Teachers**

Two teachers in this study, Katie and Leslie, were retired. Katie, a middle-aged White female, taught science in a high school in a rural school district. In her 14 years of teaching Katie taught integrated science, general biology, advanced biology, and technical biology. I interviewed Katie in the office of her current job. Katie took approximately one hour to interview and was very inquisitive but was constrained by time for another meeting, so her responses were fairly short.

Leslie, an older White female in her late 50s, was a former teacher of mine and taught science for 20 years. She discussed her 10 years of experience in a welfare office and how this greatly influenced her teaching. Leslie took approximately one hour to interview. She had a meeting and could not stay much longer. Her responses during the interview were short and she did not offer much explanation of her motivations.

**Middle School Teachers**

Three of the participants taught in a middle school. Two of the participants were employed in the same middle school. Bailey, a young White female teacher, and Crawford, a young Black female teacher, taught at Franklin middle school. This school had an entirely Black population of students. In the 2012-2013 year, the free and reduced lunch rate was 84%. The percentages of Black female and male students were 44% and 53%, respectively (ALSDE, 2013c). Bailey and Crawford were two teachers recommended to me by an administrator in the rural school district. Although these two teachers worked in the same school, they represented very different views of education.
Bailey, a young White female, was in her second year of teaching science and was a biochemistry major. She explained that she worked for Teach for America and wanted to share her knowledge of science with kids. Her interview lasted one hour. She was very enthusiastic and honest about her teaching experiences. Crawford, an African American female in her early 30s, was a teacher at this same school who had taught for 7 years. Crawford’s interview was very short. It lasted 40 minutes. She was not interested in the topic and had very little to say concerning her responses except at the end of the interview when we discussed the importance of abstinence education.

Lastly, Judy taught at Juniper Middle School. She was an older White female teacher with over 30 years of experience. Juniper Middle School reflected the following demographic information in the 2012-2013 school year: 22% of their students were Black females, 26% were Black males, 3% were Hispanic males, 23% were White females, and 22% were White males. The percentage of free and reduced lunch was 86% (ALSDE, 2013c).

Judy taught mainly life science in middle school, but additionally taught physical science and most recently environmental science. I interviewed Judy for approximately one hour, but she did not offer further explanations than short answers to the questions I asked of her. I asked Judy many follow-up questions but received the same types of responses.

Data Analysis

Before I began the interviews, I wrote analytic memos in my journal that described the setting of the interview and any relevant questions/concerns the participants had about the interview. I also reintroduced my study and the relevance of this discussion. After the interviews had taken place, I wrote down my reflections on the tone of the interview, nonverbal cues, and any additional conversations that took place after the interview.
The manner in which I asked questions was similar to the method of H. Lee and Witz (2009). I aimed to understand the inner aspects of teachers’ motivations that influence their teaching practices. In addition to the primary questions, I also encouraged participants to share their personal stories, teaching philosophies, personal inspirations, values, and personal concerns about teaching sexuality education. In this manner, I attempted to create a relaxed atmosphere where teachers felt comfortable sharing their deeper values and ideals.

The first questions I asked the participants were more basic (e.g., I asked, How do you include/discuss sex education in your curriculum?). The first set of questions was designed to allow participants to brainstorm and reflect on the ways in which sex education was included in their lessons.

The second set of questions was based on the participants’ responses and designed to analyze the more specific ways they developed pedagogy based on the topics they emphasized in their curricula (e.g., if they said they included it in anatomy and physiology of the female reproductive unit, I asked, Could you give me an example of how you developed this in a lesson you were teaching?). Thus, my second set of questions was based on how the participants included topics of sex education and then constructed specific pedagogical styles. The next set of questions that I asked was designed to analyze the invisible codes, including the abstinence education codes and taboo discussions of sex that were had or were silenced. For example, I asked participants what was taboo to discuss in a science classroom and how was the abstinence education code reflected in their teaching. This last set of questions was created to help participants reflect on ways in which sex education was normalized through disciplinary codes—whether invisible or visible.
As I coded data, I used a grounded theory approach to sort through the coded transcripts. In this method, I began by coding data in the open coding process similar to the “zigzag process” where I was constantly gathering information and analyzing data and then going back to conduct interviews and then analyzing the interviews. In this way, I utilized the constant comparative method to compare data to emerging categories (Creswell, 2007, p. 64).

I began with the open coding process and developed to the axial coding process in order to develop categories around a core phenomenon. The different categories that comprised the axial coding were contextual variables, strategies, and causal conditions. Lastly, I interrelated the different categories of the axial coding process and developed hypotheses or propositions that showed the interrelationships of the categories (Creswell, 2007, pp. 64-65). This method of data analysis helped me see how different themes emerged and then how different discourses emerged in relation to these themes. I used concept-driven codes to sort data based on the axial coding process (Kvale & Brinkman, 2009, p. 202). I have included examples of the concepts below.

The concept-driven codes included the following: language in sex education (e.g., “I ask students to keep their language clinical”), reproductive anatomy (e.g., “We discuss birth control and the hormonal effects”), disease (e.g., “The discussion of STDs is central to biology”), taboo knowledge (e.g., “Most teachers do not talk about oral and anal sex”), abstinence education (e.g., “I stress to students to not have sex until marriage”), female sexuality (e.g., “There is a high rate of teen pregnancy and a lot of students not getting prenatal care”), morality of the teacher (e.g., “My Christian beliefs and community standards do influence my teaching”), and scientific concepts that relate to sex education (e.g., “I know sex will definitely be discussed in genetics”), heteronormativity (e.g., “People with homosexual tendencies get the benefit of STDs”),
professional and personal educational preparation and experiences (e.g., “My teacher education program did prepare me to teach units on reproduction”), personal religious beliefs (e.g., “I do attend church regularly”), social and cultural background (e.g., “Sex was a status symbol of pregnancy in their culture”), as well as discourses of alarm/control (e.g., “I talk to them about the high chance of getting an STI in this area”).

From here, I generated categories based on the ways that power/knowledge relationships shaped teachers discursive practices. More specifically, I sought to understand how power infused itself in the personal and pedagogical beliefs of teachers and how this, in turn, influenced their teaching practices. For example, I analyzed how teachers molded their discursive practices according to an imperative to discuss teen pregnancy prevention. Thus, I analyzed how the power in certain beliefs made certain discourses contradictory and invisible. This also helped me to understand how teachers were caught in a double bind of science, that is, how their philosophical beliefs about teaching science either opened up possibilities for discussion or prevented complex explanations.

Furthermore, I sought to understand how power and knowledge relationships embedded themselves in the discursive practices of teachers. Power is something that can be resisted, exercised, and circulated. In order to understand how teachers made decisions, I analyzed how power was used in conjunction with knowledge to create new information and how it proliferated in discourses that concerned sexuality. For example, students used their minimal understanding of sexuality to create resistant discourses that masqueraded as truth. In another example, teachers molded scientific language to fit their personal belief systems. Some teachers used scientific language to enable conversations about sexuality, whereas other teachers used this same language to mask conversations.
I generated four different categories of power and knowledge relationships that embedded themselves in the discursive practices of teachers. The first category is the use of scientific language. All of the teachers that participated in this study recognized the power of explanation of concepts and vocabulary that students used to describe their sexuality. The language of science functioned as a barrier that either opened the possibility for conversations about sexuality or inhibited conversations that were too technical. The second category is the misinformation and proliferation of discourses. This category reveals how power/knowledge were used in pedagogical teaching styles to either promote knowledge that was incorrect or resulted in resistant discourses from students. This category also revealed the ways that discourses multiplied and changed depending on the explanations teachers gave. Taboo discourses, the next category, revealed how discussions on abortion and homosexuality manifested themselves in invisible manners. Lastly, morality discourses were those that infused themselves in the personal beliefs of teachers, or teachers deep rooted values and ethics. In this category teachers discussed the factors that influenced their personal beliefs, such as their experiences as mothers, their role in the community, and the influence of abstinence education. These four categories reveal how power/knowledge relationships in the discursive practices of teachers generated a multiplicity of discussions about sexuality. These categories also reveal how teachers negotiated decisions about sexuality according to this multiplicity of discourses.

Positionality

Among the participants interviewed, 5 were my former colleagues and taught in a school culture and subject matter with which I was familiar. I was a former science teacher in both middle and high school environments. As it concerns this study, I am familiar with the politics and culture of the local community and have taught similar courses as the participants in this
My own experiences teaching these courses and struggling with issues related to sex education shaped the way in which I conducted the interviews.

My previous teaching experiences have dealt with sex education topics that have arisen from students’ questions and from my recognition that students did not understand basic sex education topics. I elected to develop curricula around topics of reproduction, STIs, and birth control and structured them around topics of science and reproductive biology. In my teaching experiences, I have discussed sex education in relation to scientific processes and I am committed to integrating sexuality education into science classrooms. As described in the introduction, I created a “sex box” to help students ask questions anonymously. I then answered these questions in a scientific manner and discussed processes of sexuality that related to reproductive biology.

In the past, when I taught high school I stressed the importance of reproductive biology and the need to have knowledge about birth control methods, alternative sexual identities, and basic anatomy and physiology of the body. Thus, I thought it was my moral responsibility to teach students about topics that concerned their future well-being and to answer all questions in a scientific and medically appropriate manner, because I was not the official “sex education” or health teacher. I am religious, although not Christian like the majority of my participants. I do feel a moral obligation to help and serve my students, thus I developed curricula for their immediate needs.

I never discussed my personal pedagogical beliefs among my colleagues. Before I began interviewing the participants, I was nervous, because although I was comfortable discussing topics of sex education (like oral or anal sex) most teachers would probably not be comfortable.
There was also a significant age difference with most teachers, so I was nervous about being perceived as inexperienced and the teachers not taking this research seriously.

I used my experience as a science teacher to help alleviate the tension in discussing these controversial issues. Also, my familiarity with my colleagues helped them to be more honest in their discussions and frustrations. I began the interviews by discussing the nature of my study, what courses they taught, and how they related to reproductive biology. If the participant was eager to discuss more controversial topics, I was receptive and even offered examples from my own teaching. If the participant was hesitant to discuss sex education, I asked questions concerning why this was a controversial topic and allowed the participant to explain his or her beliefs. I also gave suggestions or offered questions about specific topics, if I taught the same subject matter, to alleviate the tension in the discussions about sex education. Thus, my position as a science teacher helped me to better gauge follow-up questions and to think about further concepts to ask in the topics that were brought up. My familiarity with the subject matter helped to ease the discussions and created better rapport with the participants.

However, my position as a science teacher also worked against my research because many teachers felt defensive in regard to how they structured their curriculum. One teacher became weary of my line of questions when she felt I was judging her for not discussing condoms as a method of birth control, as a fellow teacher who had knowledge on the subject. Once she figured out I was probing into issues that were controversial, she stopped the conversation to question the relevance of my research and to explain that it was illegal to have such discussions in the classroom. Other teachers would explain their position, as an abstinence education teacher, in rebuttal to my more controversial line of questions. Still others became frustrated that I persisted in discussing sex education topics because they were not the official
sex education teachers. Many of the conversations that they were having about sexuality remained in the classroom, and I felt that they thought discussing their knowledge to me was a confession of how they transgressed the politics of the school and community.

Validity

I was the sole person transcribing the data. I also ensured that the language, as transcribed, was fluent and readable. After I transcribed the interviews I asked follow-up questions to clarify responses from participants and to develop a better understanding of the discontinuities found. Journaling helped me to remember nonverbal responses and helped me to write reflections on the interview after it had taken place.

Limitations of This Study

This study was conducted with a specific number of life science teachers who had experience teaching in a particular geographic area and with particular laws enforcing their teaching. Therefore it provided an understanding of the decisions that teachers made that might be specific to this context, but might be limited to this context. I only conducted the interviews and follow-up interviews for select participants. Therefore, I had to trust in what the participants stated in the interviews. The questions in this study were primarily directed at the ways in which female teen sexuality was discussed in life science classrooms. A discussion about male sexuality was not excluded, however most discussions about teen sex involved a discussion about teen pregnancy prevention and a larger focus on girls bodies.

This study can lead to subsequent studies that analyze how students are interpreting and negotiating these same teaching situations. A future study on students’ interpretation of sex education curricula can offer new insights into teaching, pedagogy, and teacher decision making.
CHAPTER 4

FINDINGS

In this chapter, I present a discussion of the discursive practices that shaped a discussion of sexuality education. The scientific language in the discursive practices of teachers was used to mask as well as enable discussions of sexuality education. Sexuality education was minimized because of a lack of scientific explanation in discussions of disease, different acts of sex, and abortion. However, other teachers chose to resist these same topics and discussed them in complex ways. In addition, sexuality education was significantly affected by taboo and morality discourses. The discursive influence in abstinence education, for example, both opened and shut down conversations about sexuality. In the following section, I explain how teachers used the language of science education to situate discussions of sexuality.

The Double Bind of Scientific Language

Many participants felt that it was important to keep the conversation “scientific.” Most teachers used the terminology clinical, scientific, and appropriate to describe how they discussed the language of sex education. Teachers also emphasized that students needed to reword their language to reflect scientific language in order to discuss topics of sexuality education. However, teachers understood that students had little knowledge of the technical and functional aspects of anatomy or disease in the first place.

According to Liz, “STDs need to be at the forefront of an education, based on what my kids are asking.” Similarly, Lindsey stated the following:
That’s one of the biggest questions I have...what are STDs, who gets them, how do you get them, so...I last year talked about them in general. What is an STD, and then they asked me about specific ones like what is gonorrhea?... They would ask if they felt like they knew someone that had it or they had it they would go into specifics.... Last year I didn’t touch on the specific STDs though.

In a follow-up interview, Jessica acknowledged the following about what knowledge the students lacked:

They were interested in anatomically what actually is going on with their body first of all. They didn’t understand menstruation or its true purpose. They didn’t know about technical components, about organs like ovaries and fallopian tubes. They were also very interested in how conception worked at a cellular level.... The other main topic of interest was about STDs, including HIV. They wanted to know how you could acquire them besides just traditional sexual intercourse. They didn’t realize there were so many STDs that were not curable.

There was also evidence that students did not know how to relate technical and functional anatomy to their own bodies. Leslie described how she was astonished because students who were about to graduate did not know the difference between their vaginal canal and their urinary tract opening:

I can remember one little girl. I was absolutely floored to find out, she came up after class. Did I understand this right...she had no concept that the vaginal canal was not the same as the urinary tract.... She thought it was one opening.... I mean and she came up to me after class to ask that because she couldn’t do it front of the class.... I thought, you are 17 years old...that’s pretty obvious...and she was not even an average kid.

Even though they knew that students had a disconnect between technical and functional anatomy and their own body parts, science teachers strictly maintained the use of scientific language instead of students everyday language. John, for example, used the term *clinical* frequently to describe his approach to sex education:

It’s a very adult decision and are you an adult yet? And lot of them think they are more mature than they are..and I always encourage them towards the abstinence I didn’t mention that earlier because the thrust was to uh ..how do you go about teaching sex education...you do it in a clinical fashion you try not to push your set of values on others but at the same time you want them to be knowledgeable and mature about the way they
treat this..it can't be all giggles and what they seen on TV because their mom gets HBO and there is a program and they already know all that stuff.... There are some kids that are grossly immature who are making this decision, and they um…they have some psychological difficulties they are going to have to overcome.

John described his disapproval of the “giggles” and what students see on television as appropriate for the science classroom. In another statement he showed ambivalence about discussing sexuality:

If it’s going to embarrass me in front of kids then …that’s a no go. You don’t want to demonstrate directly the sexual act.... Human sexuality is best left for them to discover. These days they are going to discover a lot of that themselves…. I always offer disclaimers.... I soften the blow. If necessary, I introduce it in such a way that I determine whether or not the kids are going to be uncomfortable with it...because when I say I address things in a clinical fashion, there is going to be that occasional circumstance where a child’s cultural values might be modestly offended.... They might be sensitive to certain things but at the same time...I found that you can generally introduce topics in such a way that they understand and they do have the option to leave if necessary. But I always get the ok, but as long as I have the ok then we go because this is about dispelling ignorance not protecting our sensibilities to where we remain ignorant about everything. I want them to be knowledgeable.

Although John wanted to “dispel ignorance” he did not want to discuss the act of sexuality because he believed that it was necessary for students to discover this for themselves. Thus, John addressed a “clinical” discussion of sex without an actual discussion of the act of human sex.

Likewise, Bailey encouraged students to re-word questions in a scientific manner when asked:

I am very honest with my students. We have a very mature conversation, discussions for being in seventh grade.... From a scientific standpoint if you have a question that you are sincerely wanting to know for your own safety, yes, we are going to talk about it.... So if you are thinking oh my gosh I’m thinking about having sex with my boyfriend but I don’t know if I can get pregnant this way and you want to put it in a very straightforward scientific question that is fine.... I probably will also, if it’s brought up about birth control, I’ll talk about condoms and STDS about that as well.

Other teachers, like Amanda, would put the onus on the students to translate their slang language to appropriate scientific language in order to ask questions. Amanda explained:
It broadsided me. A lot of questions were asked all of a sudden.... What happens if I put this in my vaginal opening? Will it prevent.... I told them maybe you need to write this down and then come up with an appropriate clinical type of answer.... I don’t feel a lot of kids would ask about a lot of questions.

Still others such as Ann were worried that students would ask questions about different positions and pornography:

Sometimes kids could ask questions like what about “doggy style” or porn and that can cause chaos....I had a kid pregnant and she had the kid on the bathroom floor. the kid hid she was pregnant and swore she wasn’t pregnant…when I asked her, she denied it and had a smirk on her face…(Ridge High School) had a kid who had a baby upstairs and didn’t know she was pregnant…. She was 15 years old with two kids…and we have HIV positive students at school.

Caroline recognized a distinct separation between the scientific explanations and a discussion of sexuality education. Caroline emphasized that there was a distinct difference between sex education and a discussion of the scientific understanding of the body:

No, I don’t do the sex ed part. What you are saying, I don’t do apparently. I don’t do what you call “sex ed.” Mine is from mitosis, meiosis, and gametes coming together and you asked a minute ago and I don’t think I ever got to it...about you know the pregnancy now we do forms of pregnancy like ectopic um and then a typical pregnancy and then we do talk about things like in-vitro fertilization and you know they need to know kind of things.

However, other teachers encouraged students to translate their language into usable language and to discuss sexuality in a language students understood. They encouraged students to ask questions or re-stated students slang in scientific terms and accompanying explanations.

One teacher discussed how she “translated” the language of students when questions related to science. She used a sex box, a question box, to handle these questions. “I would have to translate that question when I said it out loud to the class...and then I would have to make sure my answer was said in a scientific [manner], but a lot of them weren’t really a lot about science, some of them were about everything.”
Another teacher helped students translate their “slang” language to scientific language. Jessica asked students to re-word questions if they were not in appropriate language:

I think it was taboo to talk about sexual acts, besides, like, vaginal sex and oral sex, but I wasn’t going to talk about like...the actual act or you know when you go down on a girl blah blah blah.... I tried to make sure the language...if they asked the question with not appropriate slang...there is slang for it...they don’t know the correct language...I would answer their question with the appropriate language.... Or if they said something that was out there...I would say...that is not appropriate to ask that way but here is my answer to your question...because they don’t even know.

Most of the teachers expected their students to use appropriate language. However, Jessica and Katie showed that without a functioning language, students were bereft of a complex discussion. Thus, often the problem with science classes were the language was used as a point of resistance and used as a function for containing sex in the science classroom. This basic understanding of language then formed the basis from which teachers developed pedagogy and explained scientific processes.

**Misinformation and the Proliferation of Discourses**

Teachers used the discussion of scientific information and processes to mask and enable discussions of sexuality. Liz, for example, discussed contraceptives as related to structure and function but also advised students to not engage in sex:

But I just judge what I do sort of by the kids, but there are ways to bring things up without trying to persuade kids trying to think something’s ok.... You can talk about contraceptives because we are talking about the structure and function.... It’s not ever like this is what you should do...or I’ll say you all aren’t old enough to be doing the hippidy dippidy.

Liz also used explanations of abstinence education with labs. In an epidemiology lab that is used to discuss the spread of disease, Liz included messages of abstinence education by implying that all students would contract diseases if they had sex:

It’s a regular part of a lesson, and we do a little lab that’s to simulate STDs, particularly AIDS, that you don’t know you have, so you don’t know you are passing it.... We do the
little sodium hydroxide in water and trade off and put the phenylthaline in it to see who’s positive in the end…. I’ll say now there were three I gave out randomly, and I say, now how many are there? And so, it’s but you didn’t have it, so you didn’t know you were passing it along…. And I tell them a scenario about Sally and Mark, and they dated in high school and they were going to get married, and they were the only ones they dated so they decided to have sex.... They shouldn’t have but they did...and then they ended up breaking up and then they went to college and this happened again in college, and they really did meet their mates.... So they had sex with their husband and two others....and they shouldn’t have been doing the hippidy dippity but they did...you know and then see how it passed along.

The story of sally and mark was used to illustrate how this lab functioned in real-life scenarios. Liz used the story of sally and mark, a story about abstinence, in conjunction with the lab to illustrate in a “scientific” manner what occurs when students have sex. In this way, she used the power of the knowledge of how disease is spread in the scientific curriculum to support the power of the message of abstinence education. In addition, she attempted to deter students from engaging in sex by showing them statistical data about how high their chances are of getting an STD in the Southeast:

I show them overheads, slides of … how concentrated the STDs are in the U.S. and of course they are all over the Southeast and not in the Northwest.... Do they ask questions about why it’s so high in these?.... We discuss questions…but you could have the same behaviors in Oregon than here, but your chances are less there.... They might say they have sex like a rabbit here...and I saw that definitely ups your chances of catching something, but um...sally and mark could have been in Oregon.

Researcher: Please take a look at this abstinence education code. Are you familiar with this?

I’m familiar with it, and it’s why I [covered] the STDs. They go through them one by one, and all the problems, and I lump them together. I don’t show pictures of genital warts and all the disgusting stuff like they do in health. I just talk about their problems physiologically, and sometimes you see the symptoms and sometimes you don’t.

The discussion of STDs was taught in conjunction with a discussion on preventing teen sex by showing the statistical chance of getting a disease. However, other teachers chose to have complex discussions of how STDs are spread and the use of condoms in preventing STDs.
For example, Jessica stated that students needed to know how you could get infected with STDs from different forms of sex:

We talk about the STDs and how you can get infected and what they actually were and which ones were living organisms and which ones weren’t, and they were really interested in it because some of them had no idea of how you get them really...and they were sexually active.... I mean they didn’t know oral sex versus anal sex versus vaginal sex...and then a lot of them don’t know where they get this from. A lot of them especially the males come in with this idea that they have been told that condoms don’t protect against HIV and the virus is too small and it can get through the condom. I don’t know how many kids...told me that.

Jessica brought up the point that students thought the condom made sex “worse”; therefore students told lies to support the fact that condoms would not protect against viruses because viruses were too small:

They literally were told by someone that the virus was too small...and it would go through the condom, and there wasn’t any point of wearing them.... And I think that especially with the kids I am working with...I mean these are all Black kids...and the majority of them are lower SES.... I think it’s just a huge stigma in that culture for them to talk about sex.... I mean they don’t talk about it...and...what they know is just what they figure out, and they wont ask anyone about it and.... I think that they were partially told that misconception, and that was just, oh well I’m going to accept that because a condom makes sex worse, so I’m going to not wear one and keep this going, you know what I mean. I think that there is just a lot they didn’t know…. We talked about fluid transmission when we talked about HIV, because we talked about the way it is transmitted, we didn’t really go into common terms ...when you give someone a bj...you know...but we did talk about like vaginal sex versus oral sex and I think there was only one class that asked me about anal sex because they have this idea that anal sex is something really crude....

In the previous example, Jessica detailed how a discussion of STDs was complicated and necessarily involved a discussion about different forms of sex, condoms, and virus size. These discussions were also intricately tied to pleasure, because if students believed that sex was more pleasurable without a condom, there are myths that students make up that support this. In this case, many students thought HIV was too small and could penetrate the holes in a condom.
However, Jessica went into a scientific explanation to explain how this idea was untrue, so students had the full factual information.

In contrast, John used the curriculum to explain to students that their bodies were not mature enough to have a child based on his reaction to students with disabilities in his own school:

I like the idea of abstinence, because like it says here it’s the only way to prevent STDs, pregnancy surefire.... I suggest that if you aren’t going to listen to any of my persuasions then at least protect yourself...because if you do bring a child into this world and you are immature, and you are going to do what you darn well please, and you think it’s not going to have any impact on that child... we have plenty of kids at this school who have all sorts of disabilities based on the fact that their mother was immature, and their daddies in their case were no shows, and were immature and now there is a baby with disabilities because you didn’t do what you were supposed to do when you were pregnant with that child.... And when the child was born you started handing him off to everybody because you still wanted to be a child.... Those are the kinds of things you can persuade towards without necessarily beating them over the head with it.

During the embryonic unit, John focused on deterring students from getting pregnant:

We have a 3-week period where we go into a complete gestation period of a human being because anatomy and physiology isn’t veterinary science, it’s human anatomy and physiology…. Yep, they all know that...prenatal practices...and I don’t get into this...because I’m not going to interfere with their decisions. I’m going to try to gently persuade...and I always bring it in that physically just like a newborn child is not fully developed in their lungs, which makes them prone to every illness in the sun.... Just because you have gone through puberty and are able to have a baby...doesn’t mean your body is fully physically mature.... The prime child-bearing ages in humans is after you’re 20, in fact 22 to 32. Those are that you aren’t entirely physically mature to have a child although you can have one...and after that you start pushing the limits of how you are going to get into the trisomies and some genetic disorders...that have to do with the older eggs.... And not just older eggs but also older sperm. They are thinking there might be some relation because autism these days and older age.... I didn’t read fully about it...but it’s well known the older you are, both are, the man and the woman...that you run the risk of getting into some genetic disorders that have a higher potential.... When you persuade them these are the ideal ages if you have a child, then you could have a child born premature. You are definitely run the risk of having a child when you aren’t mature enough to control your diet, to control the gestation period, and if your baby is born with a disability and you wouldn’t listen to persuasion or disability...you are going to have to deal with that.... Develop some maturity beyond your years.... Then access all the help you can because the child deserves it.... You brought the child into the world....
The gestation unit of embryonic development was used to support his abstinence education message. John warned them of the consequences: that their children can be disabled, and it would be difficult for students to care for these children. Thus, similar to Liz, John used scientific explanations to support his message that getting pregnant is for mature adults. Thus, John, like Liz re-circulated the power of teaching teen pregnancy prevention in the scientific concepts.

Other teachers, however, chose to discuss different acts of sex to counter students misconceptions about getting pregnant. Leslie stated the following:

A lot of teachers would say they didn’t discuss oral sex. We discussed oral sex.... Probably… anal sex, that type of thing…wouldn’t be discussed except for prison.... But…we pretty much talked about…the difference between the female physiology and the male physiology.

Katie mentioned how a discussion of different forms of sex could be used to counter misconceptions concerning pregnancy:

I would answer that question. I had the question, can you get pregnant through anal sex. I had the question can you get pregnant from oral sex, and so I referred back to our unit on the reproductive system.... Okay how does someone get pregnant…you know…where does the sperm have to go…. So that should answer your question.... There is no opening from the rectum to the vagina, and there is no connection between the mouth and the vagina so…you know….

Whereas some teachers decided to deter teenage pregnancy prevention and disease by using scientific concepts to emphasize to students to not have sex, other teachers decided to go into complex scientific conversations of the different acts of sex and disease to counter students misconceptions about pregnancy and disease. According to Katie, a discussion of oral, anal, and vaginal sex was intricately related to an understanding of the anatomy and physiology of the reproductive system. She decided to resist the push to not discuss sex because this related to scientific knowledge and it was of interest to the students in her class.
In addition to pregnancy prevention, other teachers discussed STDs in different scientific explanations.

**Discussion of Disease and Sexuality Education**

For many participants, the discussion of disease was direct explanation of scientific concepts in sexuality education and overlapped with a discussion of STDs. For example, Jessica introduced STDs when doing an epidemiology lab and when discussing microbiology:

Obviously the genetic stuff relates to sex education, but a lot times honestly I would try to pull it in with the biology classes, at the point where we were trying to do microbiology, and the epidemiology lab where they infect each other with HIV and then they have to figure out how did the virus spread.... So we’d spend a class talking about viruses and how they aren’t living things, and move into bacteria and then we’d have a big conversation about what’s the difference between viruses and bacteria.... Then we’d go into STDs and talk about, you know, what kind of STDs could you take an antibiotic for? What kind of STDs will you have the rest of your life? And, depending on the class and the comfort level of the class, sometimes we would talk about how you get those.... And honestly this was more of a discussion I had with my regular kids because, one, they were more interested.

In this example, Jessica went into an explanation of how STDs function instead of a fear-based conversation. In another discussion, Jessica emphasized the importance of discussing yeast infections when introducing fungi:

They didn’t know the anatomy...how ovulation works...why they had a period.... They didn’t know...this was not in front of the class, but there was one girl that asked me about yeast infections.... I mean they didn’t know anything.... That’s another thing I talk about with microbes...because when we talk about antibiotics a lot of them are made from fungus, and that leads into yeast infections. When you are talking about fungus and bacteria and going on and on...I tell the guys if you don’t want to listen, don’t listen...but I tell the girls...like, if you are on antibiotics...drink lots of cranberry juice...eat lots of cheese because you are going to get a yeast infection.

Jessica discussed the naturalness of yeast infections, how they develop and common remedies to help prevent them. However, other teachers chose to not go into complex explanations of specific STDs and relied on the authority of health care professionals to explain disease. Crawford, for example was hesitant about going into explanations about what can occur
with specific STDs like syphilis, gonorrhea, and chlamydia. She explained they did not discuss transmission of these STDs:

   We talk about different ways to take care of your body, different diseases, or that you can get it if you don’t take care of your body—the skin, the hair, the eyes, mouth, all kinds of stuff like that, and we even um talk about drugs and alcohol abuse, and sometimes we talk about sexually transmitted diseases like syphilis, gonorrhea, and chlamydia...and it’s not in detail.

She said that even though they didn’t explain syphilis, gonorrhea and chlamydia, she did go into detail about HIV transmission:

   Yes we have talked about HIV. Most of them already know, you know, or think they know what it is, and you know how you get it, or whatever.... I teach it when we are talking about HIV. I tell them what it is, how it’s transmitted, and we look at it um a virus, and sometimes when we are talking about the difference between viruses and bacteria and I would bring up HIV and how it’s a virus, like a common cold how it’s a virus...and you can’t get rid of it, and it’s always in your system. That’s how I talk about that.

When asked why she taught about the transmission of HIV, she stated that the course of study requires it. Other teachers were hesitant to discuss complex explanations of STDs and contraceptives. Amanda, for example, explained that she brought in a nurse to answer questions about contraceptives:

   Not in advanced, but in regular classes I was asked a lot about contraceptive methods, what was effective, and what was not. They had a lot of misconceptions…and the last time I taught it I had a nurse, PhD nurse, who works with AIDS outreach and education of students in contraceptives, and she came and spoke to the class and brought videos and provided them with information.

   Students in the advanced classes don’t need information, but regular don’t understand the difference between contraceptives, so had another expert come and talk to these classes specifically b/c they are lacking in information.

Similarly, Amber used a school nurse among other resources to touch on STDs with her class:

   Usually, I will touch on STDs briefly in biology. Following my instruction to this class, I will utilize some other resources such as a couple videos I have collected over the years that center on STD prevention. Or a guest speaker…sometimes the school nurse who can more easily secure the trust of the students about these issues at this age.
Other educators decided that when it concerns sexuality education, students should be their own educators. Amber asked students to do research that supplemented her own curriculum:

In anatomy & physiology, I do the bulk of this instruction and even have the students research STDs on their own…. The unit is concluded by viewing the video, “The Miracle of Life,” in which they get to witness a live human birth.

John discussed how he encouraged students to be their own educators:

Oh yeah I go to the internet. I use videos like I said. I’ve got models…. To some degree you can do role playing, but for the most part you want the kids to develop the capacity to delve into it themselves.... You want them to become their own educators...so you assign things that spell it out...and you suggest very strongly there are some things that they better come out knowing.... They generally arrive at the final destination of what they need.

Whereas Jessica went into serious discussions about STDs and yeast infections and resisted not teaching about infections in the vagina, Crawford only taught about HIV/AIDS because it was mandated in the course of study. Other teachers were hesitant to teach about STDs or contraceptives and brought in a school nurse or encouraged students to be their own educators. Even in complex discussions of STDs, most life science teachers did not go into detailed explanations of their modes of transmission or how to manage them. Likewise, John, Amber, and Amanda did not explain the use of contraceptives without a school nurse. Thus, these educators are unwilling to cross the line into a discussion of contraceptives or even explanations of STDs and their modes of transmission and functioning in the human body.

**Counter Discourses from Students: “Counting the days” and the Sex Box**

Students came up with their own counter discourses to information that was missing. One common method was for students to “count the days,” or discuss how they could gauge the best time to have sex. This was a way that students used their own language to explain and manage sexuality. Often, teachers were hesitant to go into complex scientific explanations that corrected
students misconceptions concerning this method. In order to counter students misconceptions such as these, Katie, created a “sex box,” a question box for students, so students could ask questions about sexuality in their own language. This teacher used scientific language to respond to students questions about sexuality.

**Birth control methods: Counting the days.** One common birth control method discussed by teachers and students was “counting the days.” In some cases, this method was sanctioned by teachers, however, in other cases teachers discouraged this method with little scientific explanation. Jessica discussed a common misconception for students:

> When we were talking about spermatogenesis and oogenesis, because they didn’t know how it worked...they had these misconceptions about, like, if you have sex and ...you know pull out, you are not going to get pregnant, and if you have sex on your period, it’s impossible to get pregnant...and like just all this weird stuff.... I don’t know where they get it from.

Similarly, when Bailey was asked what questions students had about pregnancy, she stated that students had many misconceptions about when they could have sex without getting pregnant:

> Misconceptions about how to get pregnant...I think she was really concerned with how to get pregnant and she didn’t know if she could get pregnant on her period for example, or if there was one type of month she could have sex and not get pregnant and where you could get condoms and questions like that...about... protections, and how can you get pregnant.

Amber described “the counting method” that students used:

> One particular example is a time I remember a student extending what seemed like a never-ending line of questions about the menstruation cycle.... How many days in the cycle, when exactly is a female “fertile,”...does this mean that you could have sex at other times and not worry about getting pregnant...and so on....I tried to answer each question as best I could while maintaining the highest level of professionalism. When I didn’t know...I said so, but I was also ready to point her in the right direction so she could seek out any answers that I couldn’t give.... I was able to put out any fire that had started that encouraged the kids to “count the days” so they would know when to have unprotected sex. Instead I left that class feeling like if anyone had believed in those means as a way to birth
control…they were not quite as sure when they left my class…. Hopefully I made an impact on a future decision in a positive way by increasing the real knowledge (not just the old wives’ tales) within my students…. True understanding leads to informed decision making.

Although she was able to “put out the fire that encouraged them to count the days,”

Amber remained skeptical about how much they knew after leaving class. Similarly, Jessica described a situation where a student became angry because she did not understand how pregnancy occurred:

I remember we had a first-period freshman biology class…and I’m looking out at the entire class, and two girls were really interested, and one of the girls I really liked…she was a huge discipline problem but she was a smart girl, and eventually I got her into honors classes…. The other girl was a girl that was just ...like your typical pain in the ass student...and I told the class, I said if you are sexually active and you are not using any form of birth control, by definition you are trying to get pregnant, and the one girl...the bad girl...said what are you talking about? Just because you are not doing anything doesn’t mean you know you are trying to get pregnant, and she just went on this tirade, and I couldn’t figure out why she was so angry…until about 3 months later she was showing she was pregnant. So I guess she was angry that I had sort of said she was trying to get pregnant, where in her head…I guess she hadn’t thought about it.

Here, the teacher stated that if you were sexually active and you were not using birth control then, by definition, you were trying to get pregnant. However, because the student became angry, and the teacher did want to take on this controversial subject, the student did not understand how pregnancy occurred.

Caroline attributed the method of “counting the days” to a socioeconomic and class difference.

If you ask what the kids are asking that does come into a socioeconomic thing, I’m just going to tell you the lower SES kids ask totally different questions because app they do use the method of counting the days and they don’t even know when they start. I mean honestly, I’ll give you an example…. Teaching biology, one of the questions was they thought you start counting after your period. No no, honey, it’s the day that it starts...day one.... No wonder they are teen pregnancy rates, is they have no idea…and they don’t understand….
that’s strictly hormonal...and they don’t know what ovulation means. They don’t have a clue what that is. I was like, oh my gosh, no wonder.

In the preceding examples, students had many different types of misconceptions about “counting the days” and judging when they could or could not have sex in a particular cycle. One teacher attempted to correct the day students started “counting the days,” and another teacher failed to discuss the situation in depth. The teachers did not offer complex explanations of why these methods were scientifically inaccurate or might be misleading as a birth control method.

These students were confident in their knowledge, although the teachers warned against it. Because students either did not have information on access to contraceptives or faith in how they functioned, they believed in their own sexuality discourses. This is an example of how sexuality proliferates and it creates new discourses in the absence of others. In the following section, I discuss the teachers who were willing to have complicated conversations about sex education topics and the way they similarly resisted the conversations on reproduction that were bereft of true knowledge.

**The Sex Box**

Katie revealed how she developed her own method for handling questions about sex in her classroom. Katie discussed how a tech biology class she taught had a health education component. She stated that although she was receptive to the questions students had, she did not want the students to interrupt her when she taught curricula that were not sex related. So she created a sex box, a name the students coined, to answer students questions while staying on pace with her other course of study:

The tech biology class had a health unit and...the reproductive system was a part of that, so there was no getting around it with the tech biology, and that was tenth grade and there was a lot of curiosity and I did let them ask questions. I had a
question box that I wouldn’t let them interrupt class with their questions, but they could put them in a box and then when we had time I would go get a question out of the box, and that was their favorite thing. But if you ask them today what was your favorite thing about Ms. Katie’s class they would say picking out questions from the box.

Topics that came up included oral sex, anal sex, vaginal sex, masturbation, birth control, STDs, and the use of condoms. In the following quote, Katie described how students did not understand whether masturbation was an accepted practice or not:

Masturbation topic comes up, and I have had students ask me point blank if I think masturbation is wrong…and I… I don’t have an opinion on that…. I think that it is very common and a personal thing and I wouldn’t give them a thumbs up or thumbs down on masturbation…. But they do. It’s so odd… they want a teacher to approve of something…. But it’s like they were kind of led down the wrong street by well-meaning adults. I mean my aunt told me, and my mom told me …and it might have just been something to keep them from having sex… some kids were told they would go blind if they masturbate…. There were some kids that believed that… they would go blind, because I had a student ask me why do you go blind if you masturbate, but you don’t go blind if you have sex with another person…. What’s the difference?… I said you don’t go blind from masturbating…. I said that’s what people say, but it isn’t true…. They were willing to risk blindness (laughing).

Katie stated that some students were purposefully given false information to prevent them from having sex. The students wanted to know if auto-eroticism was “wrong” or not. However, Katie decided to remain neutral on this subject. Katie was also asked what other questions students asked and stated the following:

They asked a lot of specifics about birth control, and I told them when I wanted to give advice about what to use I said talk to your doctor… that depends… some people can’t handle chemicals… so birth control might not be an option…. That’s a health issue you need to talk to a medical professional about… but there’s plenty of options, and it always came back to the simplest one, condoms. It was something they could get their hands on … everyone…. I haven’t taught a student that didn’t have a chance to get a condom if they so needed one.

Katie definitely did not feel comfortable discussing birth control with students and so she discussed the option of a doctor. She also discussed condoms as the simplest form of birth control; however there was not a more complex discussion of condoms in the act of sex. She
acknowledged that she translated the student’s use of vocabulary into scientifically appropriate vocabulary. When asked how she handled the questions, she stated the following:

As bluntly as I could and tried to keep it with scientific language when answering the questions, because they didn’t use that kind of language in asking the question. So I would have to translate that question when I said it out loud to the class...and then I would have to make sure my answer was said in a scientific, but a lot of them weren’t really a lot about science. Some of them were about everything.... I would answer that question. I had the question, can you get pregnant through anal sex I had the question, can you get pregnant from oral sex, and so I referred back to our unit on the reproductive system ...okay how does someone get pregnant...you know...where does the sperm have to go…so that should answer your question.... There is no opening from the rectum to the vagina, and there is no connection between the mouth and the vagina so…you know….

Thus, Katie used the sex box as a form of resistance to the power of teen pregnancy prevention.

It is important to note that she kept the conversation scientific and referred back to the power of the science curriculum to support her discussion.

Taboo Discourses

Abortion: An Invisible Code

A discussion of abortion was starkly missing, especially in the fetal development curricula. Some teachers cited that the course of study prohibited it, whereas others cited that it was an illegal practice that physicians could not perform. Although teachers discussed prevention practices, especially for females, this issue was deemed too controversial even for anatomy and physiology classrooms.

Jessica and Leslie stated that a discussion on abortion was an important conversation to have, because many students had misconceptions on these issues. Jessica recalled one important misconception that students had was that they did not understand fetal development and believed that as soon as a zygote was formed there was baby in the womb. Jessica stated that before we talked about conception and ... what a zygote is, and when the sperm and egg come together, and the development of the embryo, and then it’s a fetus…I would really stress it’s not a baby until it comes out…you know, because they…a lot of
them…thought that like…when you got pregnant it’s like you had a miniature baby, and then it just grew into a big baby…. I guess they just thought it was magic…and they were told it’s a miracle…and that’s just a miracle…. They literally thought it was like a sponge in a capsule that grows to be…a giant baby, and then it comes out and...so we talked about that.

However, in another statement Jessica acknowledged that the topic of abortion itself was not discussed:

We didn’t talk about abortion.... I don’t think we ever talked about abortion...but there were some classes that I discussed birth control with them. I don’t how we got on the topic.

When Caroline was asked about abortion, she stated that

it doesn’t even bother me because I felt like they needed to know and the hormonal stuff that is part of human anatomy that is physiology part, and that is stuff that is in the course of study. One thing the course of study wouldn’t let us talk about is abortion.

According to Caroline, the issue of abortion was not allowed because it was not sanctioned by the course of study. She stated that I (the researcher) needed to look this up to see whether it was a fact or not, although she was sure it was. Bailey, on the other hand, discussed abortion in the context of a scientific discussion. She did not use the A-word, as she stated, but she discussed it with reproductive technology and fetal development:

We do talk about fetal development.... I mentioned abortion when I was talking about genetic engineering and all the advances with technology. I didn’t use the A-word but I said if science is getting to the point we can tell what genetic diseases the fetus has, that could cause huge issues ethically because then the mother can decide whether she wants to keep the baby...and they were like, huh it really struck a cord that you know abortion isn’t just for people who are knocked up when they are 13 and they want their lives.... It’s like we are getting to the point where there are these other issues...where we can know about the unborn baby before.

Bailey tiptoed around the issue of abortion even though she recognized its validity in reproductive technologies. Liz, an anatomy and physiology teacher, read the Hippocratic Oath to cover the abortion discussion:
They’ll ask I really don’t um I really don’t do the topic of abortion except to say that as in the very third lecture I read the Hippocratic oath...and they say they swear not to do an abortion...and this was 500 because but it’s not a new issue...it’s not an issue to just what we call the civilized world...and that it’s not an issue just there, but it’s an issue in the Brazilian jungle.... They know eat the vine of this and so on.... But it’s a universal thing. It’s not just us.... But I don’t get into abortion except when they ask about the morning after pill.

Liz wanted students to know that physicians take an oath to not perform an abortion, so she was telling them that any physician is not supposed to perform this procedure.

Although most teachers did not discuss issues of abortion, Leslie did discuss all of the options available to students. She discussed how her experiences working in a welfare office had an effect on her view of controversial issues:

It was major because I had seen the 12-year-old little girl pregnant with twins and no one to support them.... She was a baby herself.... Where maybe I wouldn’t necessarily personally have an abortion ...if that were my 12-year-old little girl it would be different and...so you try to tell your students both sides and let them make up their own mind. You know personal responsibility is taught from day one in your families, and there are a lot of children that aren’t being taught that, and they don’t have any concept of being responsible for outcomes....The welfare office taught me so much when I saw that 12 year old child pregnant with twins.... Before I would have said abortion...but...I thought if that were my little girl...and have twins with her body.

Leslie discussed how important the topic of abortion was, especially as it concerned morality and the thin line between abortion and murder:

It was in one county near here...she was executed for murder. They based it on the pathologist found she miscarried the baby that she had not...and she carried that baby in a shoebox...and she was terrified of her husband finding out.... Once again consequences for your actions. She knew what she did was morally wrong, and she wasn’t able to...she was more concerned with what people thought than what was right...those guidelines that God gave us was important.... I never had to carry a dead baby around in the back seat because I never got into that position.

Thus, she believed abortion was a topic necessary for discussion:

Yes I did.... We did discuss ...we did and...there were controversial issues...especially abortion...and it was really important that you say...this is the topic...here is one side of the issue...here is another side of the issue.... As an educated person...you need to know both sides...so you make your mind about what to do....
For Leslie, who was atypical, understanding their options was important for youths who might need to make an educated decision according to their circumstances. Thus, different teachers responded to the topic of abortion in markedly different manners. Some teachers would use the scientific classroom as justification to go into an explanation whereas other teachers would use medical knowledge and the course of study to justify why this was not discussed.

In addition to the topic of abortion, homosexuality was another taboo topic that was discussed in different scientific and cultural explanations.

**Homosexuality in the Science Classroom**

Homosexuality was discussed in two major ways, as a scientific explanation and in the personal lives of students. Liz stressed that abstinence education also taught about transgender, transsexual, and hermaphrodites as a part of the anatomy and physiology class. Liz had a resolute view of how sex is determined in embryonic development:

> We also do...developmental stuff, you know, on a baby, when they are at this age the sex is not determined; it’s only after so many weeks that there is enough testosterone to trigger the development of a boy or a girl, and then the stages of the genitalia development, and the stages of the internal development of the ovaries and the testes, you know, what’s going on inside and outside and how that’s all determined and what happens when the baby is born and it’s not exactly right... It’s sort of different...and how that can happen.... I mean what some of those other shows call hermaphrodites, but they are not really...but they may feel like one gender or another but they were indifferent. It wasn’t one or the other in terms of what they looked like when they were born...and whether to wait or not wait to fix that...and that sort of thing.

Similarly, Liz used an example from the news to explain that a “man” cannot have a baby: One must be either female or male:

> The man in Colorado...the first man to ever have a baby...how can a man have a baby?... And I said, well I wondered the same thing and I watched the program.... Turns out he is not a he, he is a she. He felt like he was a man inside...and he didn’t want breasts, and he had them removed in Colorado....The definition in their legal things of a woman or a man ...a man does not have breasts and so he was legally a man even though he had a
uterus and was taking male hormones and stuff.... So it wasn’t...he isn’t really a he, he’s a she reproductively.

Leslie displayed how her religion directly influenced her science teaching. She renounced queer individuals as an abomination. She stated the following:

Homosexuality…it was discussed in the terms that it was an alternate sexual lifestyle…it was not ...endorsed or approved but um...I know that there were many times, and I probably shouldn’t have said this, but I have said that I’m a Christian, and my belief said it was an alternate lifestyle and it is an abomination…. But...I personally don’t believe that.... I feel like one of these days we are going to find the gene that’s an alternate lifestyle. I may be wrong.

She attributed her religion to this understanding, not her, and so explained homosexuality as genetically determined. In another statement, Leslie stated the following:

Because I would argue that homosexuality is genetic and it’s not a choice...there is research to support that but I don’t know if that would be appropriate for me to bring up.... But I think it’s important to talk about the difference because of all that stuff.

Amanda acknowledged that the law that stated that homosexuality is a crime was not supported by teachers in her town. However, she did not fully support the lifestyle. She acknowledged that she discussed whether or not it was genetic:

I don’t really think it’s taught at all in our health class at Crescent High—number 8 about homosexuality…. It is consistently the law in this state...but I don’t think teachers actually teach this, not in this town…. Maybe in other schools in AL.... But I do have questions about homosexuality and whether it’s genetic or not...so we do address that, and we talk about studies that indicate that it is, and studies that indicate that it isn’t, but we do discuss that.

John, like Leslie, discussed the homosexual lifestyle as unacceptable. John incorrectly attributed homosexual conduct to STDs:

Homosexual relationships …you don’t want to parade heterosexuality in their face all the time, but you do want to encourage the predominant activity in this affair that must be nurtured towards a healthy...

Researcher: Heterosexuality?
Yeah, yeah. Exactly...mutual respect...that’s the one that will result in children more than likely...um the ones who have the homosexual tendencies, they get the benefit of STDs...that you can spread STDs if you don’t behave in a way that is prudent.... I mean it could happen to you too...but the vast majority is the heterosexual relation.... You should have trained your child by that time to where they don’t have a lot of pressures that are dominating in their thoughts, but where they can get together with some one of the opposite sex where there is a certain code of behavior that is acceptable because you are not going to be there.

This participant did not support homosexuality, because he believed that diseases were spread through these types of relations. Instead of clearing misconceptions, he perpetuated incorrect scientific claims of individuals who are not heterosexual and shut down discussion about sexuality for queer students. However, participants recognized that there were misconceptions in students’ ideas of the relation of HIV to homosexuality. Jessica discussed the students’ misconceptions that she had to correct:

We discussed the differences between viral and bacterial STDs and the use of antibiotics. They had a lot of misconceptions about HIV especially. Some of them still thought of it as a “gay” disease. In general a lot of their general knowledge was incorrect, and they said they had learned it from a friend or sibling.

Jessica discussed the cultural influence of queer students in the classroom. In particular, she discussed the experiences of African American students and the queer lifestyle:

I never really had the topic of homosexuality that wasn’t a bullying, teasing-based incident...um now I did have one girl this past year who was openly a lesbian and everyone knew she was a lesbian.... I don’t think she had decided that at the beginning of the semester, but at the end it came out, and most of the kids handled it pretty well.... They didn’t tease her.... There was one kid I had to get onto once. He said something immature...but it wasn’t directed at her. It was more like haha girls doing it to each other.... But I feel like, in my experience, I don’t know this for a fact, especially in the ninth grade, that the Black community is a lot more accepting of lesbians than gay males.... Like I think that the men are...totally bullied, and given a hard time, and ostracized, and …made fun of etc. etc. But I feel like the girls are kind of accepted a lot of the time.
Similarly, Bailey discussed the alienation of queer students in her school’s culture and the language that supported heterosexuality. When asked about how queer students were perceived she stated the following:

Oh yeah, I mean I would say I’m probably the only or few teachers that feel this strongly about these issues.... Even with the gay/lesbian...we have teachers here if they see two boys in the bathroom they say you going to make me suspect that you are gay if you don’t get out of here in a minute.... Teachers would tell students they are immoral, so absolutely...it’s really hard you know for them to trust adults when adults are continuing this....

Bailey is the only teacher in this study who felt very strongly against the mistreatment of queer students in her school. She stated the following:

If it got me fired I would be fine, still especially with the homosexuality piece, I’m not ever going to tell a child that homosexuality is not acceptable…. Who am I to tell that to a child who is developing their identity at this critical stage in life when...you know they are trying to feel valuable and trying to understand life, and I think that this needs to be more factual, like this is what happens...like actually teaching reproduction and not trying to preach.

Although she is very passionate against the injustices of queer students, she would not go into an explanation of intersexed students while there was an intersexed student present in her classroom:

I don’t go there.... I don’t think my kids are quite mature enough for that...and actually I have one student...his mother told me this one day, and I was talking about his behavior, and she told me he was born without a penis, and so I’m nervous to talk about it...if they...just because their maturity level is not...especially with the student in the classroom who that might apply to.

Thus, these teachers recognized an especially homophobic environment for queer students. Bailey and Jessica recognized this environment and worked to resist this environment. In contrast, Liz taught a number of topics centered on queer, transgender, and transsexual individuals. She was very open to understanding the physiological mechanisms to explain behavior and taught these topics based on the interests of students.
However, she assured the students that individuals who are “different” are explainable, either in their anatomy, difference in hormones, and how they develop into a boy or girl. Thus, issues of sexuality that queer students might ask might not have been sanctioned by school cultures or the teachers.

**Morality Discourses**

The majority of science teachers interviewed—Amanda, Amber, Leslie, Caroline, and Katie—all believed that students were having sex and needed answers to their questions. For most of these teachers, influences of religion, “community standards” and a discussion of teenage pregnancy prevention directly influenced the decision making abilities of teacher in relation to sexuality education. However, other teachers negotiated a discussion of sexuality in different ways despite the strong influence of morality discourses.

Amanda cited how the community and parents had an important bearing on discussions in class:

Therefore, you need to know how to keep the conversation about a lot of this fairly clinical as far as in order to maintain a relationship that the parents are happy with.... You discuss and provide the students with information that is necessary, and the students are comfortable asking those questions.... You really have to dance along a fine line as what is appropriate for you to discuss with the students and what is more appropriate for the parents to discuss with the students based on their families, religious and cultural factors.

Amanda acknowledged that she had an understanding of the “community standards” and from her experience as a mother. Therefore, she believed her role as a teacher was to not overstep the boundaries of the parents’ job:

Living in the community and having had children go through...yeah. I know as a mother...what would be acceptable for a teacher to discuss with my boys and what I would not want them to discuss with my children, and I don’t want them as teachers to impose their value system on my children. That’s my job...and you know I want them to get the facts. But as far as values concerning religion and those types of things, that’s my job and my church’s job and not the teacher’s job.
In addition, Amanda acknowledged that she was not unbiased, and her Christian beliefs influenced her teaching:

I don’t think that they can totally remove themselves from their religious and personal beliefs. As a Christian I am shaped by what I was taught as a Christian; however I did not let my Christianity keep my from being open to other people’s views, because I don’t want other people telling me they believe this way and because they believe this way I am wrong.... I am very open and accepting of other people but I don’t think you can remove yourself from your cultural upbringing.... I think you can be accepting of others, but we all have some things that you know we obviously try not to influence us...I try not to let it do that. But I’m not going to say I’m totally unbiased, because that would be a lie.

Similarly, Amber showed contradictory attitudes between wanting students to be sexually knowledgeable and maintaining pressure from her community as well as being a mother:

Lots of kids are experimenting with sex at much earlier ages today. I have four teenagers of my own. I certainly hope they have the knowledge and understanding of issues surrounding sex, STDs, teen pregnancy, etc…to make a good decision if/when the situation arises for them personally. I try to think about how I would feel as a mother of these students…. How would I want the teachers of my own kids to handle similar situations…. How much should they share and so forth…. Usually this is a pretty good gauge for how to say things and what exactly to share.

Leslie, like Amber, discussed how students needed to be informed about all of their choices:

By nature I am conservative, I’m a Christian.... I’m more on the conservative side. My political side, I am conservative…. So you would think I might not be as open with the kids as I really was...so...I had such a desire to see their life improve. It was just they need to know this.... Like I said, I would tell them everything. This is choice 1, this is choice 2, this is choice 3, and you had to be an educated person…to be able to make good life choices, and with knowing all the possibilities.

However, she also stated that abstinence was something that she pushed although she realized this was not the reality of students’ lives:

Well, you know this is surprising to me.... I’ve gone through most of them...I would um...like abstinence as the only complete.... We would always say that [abstinence] was the only 100% effective way of preventing STDs. But you know the bottom line, you know that was not a possibility for a whole class of students. You knew that wasn’t....and...I can’t...say that I didn’t believe that I felt sexual activity should be within marriage...but I don’t think that I ever... felt like the majority of the kids in the classroom...
were going to wait until they were married.... We discussed, you know, the better the chances of a... child growing up in a two-parent home was so much better for everybody, mother, father, and child.

Although most teachers cited that their community, parents, and religion influenced them to be conservative, one teacher, Bailey, resisted the dominant discourses of her school culture and her religion, like Leslie. She discussed how her religion and moral responsibility for her students led her to feel she should inform students of sexuality knowledge:

I identify as a Christian, but I’m a liberal Christian and I am realistic about what is happening especially with my kids.... I’m a biochemistry major and as far as science goes I don’t personally find a conflict with God and science, because if God created this world he wants us to discover it and ...you know and if there is a God...as far as science goes in evolution that’s never been hard for me.... Like I have never grappled with it...as far as sexual education goes. I definitely think it’s too young for students to be sexually active, but I think it’s more important that they were informed....I think I would rather my students be using condoms than be in my class pregnant.

Bailey was also concerned about pregnancy, therefore she believed she was morally responsible for having these conversations, because in her school, she knew most of the time they were not taking place:

I feel morally responsible…to inform these children, and I don’t want to overstep what their parents want them to know, or step on any toes. But at the same time I interpret my job as a science teacher. I teach them science, and if there is something scientifically that can improve their quality of life, then I feel like I can talk to them about it…. Sometimes I’ll go home and wonder if their mom or guardian would have a problem with this conversation, but I think there is probably no one else they are comfortable having this conversation with.... I wish when I was in school that I had someone that was honest with me.

Bailey also resisted her principal and parents and decided to have complex discussions about sexuality. She acknowledged that the administrator noticed the discussions she was having and asked her to “scale it down”:

Last year I had intentions of going more in detail about the reproductive system, but I had a conversation with my principal about it, and he said you need to scale it down and only teach what is in the course of study [she indicates not so much in depth about
reproduction]. Now...this year I will probably go into more detail because of the things that came up last year (laughing).

Thus, different teachers used their experiences, religion, and understanding of morality to enable discussion of sexuality education and to justify the constraints in these discussions.

**Abstinence Education**

In addition to morality discourses, abstinence education also greatly influenced how scientific concepts were taught. For example, Liz discussed how STDs are more concentrated in the South, therefore it was important to not have sex:

Yes, then I show them overheads, slides of where how concentrated the STDs are in the U.S. and of course they are all over the Southeast and not in the Northwest.... Do they ask questions about why it’s so high in the Southeast?... We discuss questions...but you could have the same behaviors in Oregon than here, but your chances are less there.

She then related the fact that students in the South have more STDs to the negative effects STDs can have on their bodies, including the destruction of the ovaries:

I tell them my niece’s roommate in college was having a lot of trouble with abdominal pains, and they found out she had I don’t remember which STD she had but it destroyed her ovaries...and she couldn’t have children by the time they found out about it.... I said she went to Vestavia and so did he, because apparently he was with someone else before he was with her.

Liz also gave a moralizing discussion on sex education to the regular students. The regular students were mostly in the basic science classes. She emphasized, to the girls, that they do not want to be pregnant and drop out of school:

Yeah...when I taught the regular class the anatomy, I just said you got to realize who you are.... You aren’t somebody because a girl thinks you are cute, and you aren’t somebody because a boy says you are cute.... You are somebody and you are going to be somebody’s mother, and what kind of mother do you want to be? Do you want to be the high school dropout who never did anything and you aren’t proud of what you did? Or do you want to be the person who went to college and found someone who is going to stay with you and not today not tomorrow, forever and you know talk to them about their own person because a lot of times those girls would go on from one to the next because they made them feel proud because they were wanted and have a good self-image of what they can be....
In this way, Liz emphasized abstinence education to help students decide to prevent teenage pregnancy.

Likewise, John also taught anatomy and physiology and also promoted abstinence-only education, but in a different manner. Like Liz, his central aim was to warn students against getting pregnant. However, John related abstinence to the high rate of teen pregnancy and STDs.

Abstinence is fine by me.... It’s a wild climate out there because especially with the demographic that I have had in times past.... The high rate of teenage pregnancy and the tapes I got that were bump and grind tapes from kids that were listening to them in class...they would holler at me when I took them up.... I listened to them and some of them are awful... even though I deal with it in a clinical way and I try not to step on the kids’... family values, their home values…. I do encourage abstinence. … I encourage it because, as I tell them, it’s a very adult decision to make to have sex. It has all sorts of psychological ramifications and the potential for bringing disease into your body or a child into this world.

However, in this next quote, John outlined the boundaries of what is acceptable and what is not acceptable in an anatomy class:

I imagine there are all sorts of things that would be out of bounds like... I said you can’t show the sex act directly....and there would be certain things that you might..think about using that could be pornographic.... That’s a no go.... That has to do with the standards of the community.... You don’t go to places that are going to place children into a more adult circumstance.... You don’t want them to consume things that are confined to adults.... In a high school class because they are a captive audience, and they don’t have a choice about being there, and it’s the adult’s role in the classroom, and it’s the adults role to protect them from things that would be best suited to … make decisions for them....

John described a time where a teacher overstepped the discipline boundaries and accidentally showed a video that was not appropriate for class:

Oh yeah, yeah. I don’t transgress that.... A colleague of mine put on a video and had not previewed it and the video got very graphic, with the delivery of the sperm inside the female of the human....

Researcher: What do you mean by graphic?

As in showed the entire sexual act pretty much to the point of ejaculation, and she had not previewed it, and when she saw that she became horrified and fell all over herself trying
to turn it off, and some of them were into it, and you really want to preview…. If it’s in a soft context like the tortoises, that’s part of the birds and the bees everybody pretty much knows those things if you’ve had pets. You know about pets and how they go about making other little puppies and kitties, but if it’s in the context of human sexuality there you have a risk of running into taboos, and you don’t want to transgress that.

John clearly defined that the actual act of sex, even if it was confined to the delivery of sperm, was not okay for students to watch in an anatomy class. John also stated that there were taboos to a discussion on sex, and no teacher wanted to transgress those boundaries. The more “adult circumstances” were not okay for the classroom, because they were not in line with community standards. Thus, the power of abstinence education is circulating in many teachers’ views as something that should be confined to adults.

A third participant, Crawford, agreed with the abstinence education code but avoided the conversation altogether:

Yeah oh yeah...during my 7 years teaching I’ve had at least one child to come up pregnant...at least 5 of my 7 years teaching.... Most of them are eighth graders but I had a child who had a child in the sixth grade, had a miscarriage in the seventh grade, and is now pregnant again in the eighth grade, so I know some of them are...I’m pretty sure a lot of them aren’t, but some of them definitely are.

When asked about abstinence education, Crawford cited that parents need to be notified and students need to understand the consequences of their actions:

The emphasis on abstinence and the ethical conduct and consequences...and if they do decide to go ahead, they need to know what’s going to happen if they do, including calls to mother and father, and if daddy don’t do what he’s supposed to do.... Those are good concepts that need to be taught... Because I think they were informed…how much a baby costs, how long you literally have to...I mean then that would curb a lot of them from doing things...you know...the consequences...would deter them from participating in the act.

When Crawford was asked about her personal beliefs, she stated,

I try not to put any of my personal beliefs into the lesson, because if I do I would be on a soapbox going on all day long...about various topics.... But I try to stay as closely aligned to the curriculum without much deviation…. Like I tell them...like evolution.... They would tell me what do you think, because I go to church and this.... And I say, well I
can’t legally express to you my opinions or beliefs or whatever, but this is what I’m here to teach you.... So you know you can form your own personal things after you have learned the material and then form your beliefs from that. But I try to stay as closely aligned with the curriculum as possible...the course of study...yeah yeah.

Crawford was aware of the legal code of abstinence education and did not want to transgress this code. Thus, she believed she could not transgress the abstinence education code. However, other teachers did not explain sex education in terms of abstinence education. They did not agree with abstinence education and believed in a different understanding of sex altogether. Two teachers, Katie and Jessica, openly taught sexuality education. Jessica was confused about the origin of why students were getting pregnant. She discussed how the other teachers in her school believed the lower SES students wanted to become pregnant. However, she felt otherwise:

I don’t think those girls wanted to be pregnant. I mean maybe they did. Some of the other teachers at the school say, oh, they just want to have something to love and they are trying to keep a man, and they want to have a baby, but honestly I don’t think there is a lot of premeditation that goes into it.... They are like 14 yrs old.... They want to have sex because it feels good, and then they get pregnant…they’re just ingrained in a culture where their mom had them when they were in high school.

For Jessica, the other teachers influenced her perceptions of students and teen pregnancy.

They promoted the idea that it was the values of students’ culture that were to blame for teen pregnancy. However, Jessica stated that

people have been having sex since the existence of the human race, and the only thing that has held them back historically, kind of the way families were, and the strictness of how religion was the government, and they would be publicly shunned, and that just doesn’t happen anymore. That’s not the way that it is, and the kids that need the most education and the most access to birth control are the ones that don’t get it. And those are the ones that get pregnant, and then we get angry they get pregnant because they are poor. And then people are like, oh we have to pay for them, and oh we have to pay for their children, and yada yada. Well you shouldn’t have let them get pregnant in the first place.

Jessica has an understanding that the students who got pregnant did so because they did not have basic educational support, not because it was a part of their culture. However, when asked about why students got pregnant at her school, she replied:
I think it’s a Southern thing.... I’ll just do what my mom says.... They don’t really question, well, what do I really think about.... I think a lot of that discovery doesn’t happen until you go to college. And a lot of the lower SES kids will not have that discovery…. They are stuck in...in a cycle of...their little community and their culture...their mom had them when they were young. Some of them had kids when they were young…. There is not a father there.

Jessica explained on two separate occasions that the regular students were being raised by their grandmothers and have little informative education in relation to sex education. This can mean a difference in access and information for contraceptives, especially for girls who use protection:

I don’t feel like these students have religious beliefs against using contraceptives or anything. I just don’t think they have access to and/or discuss sex and related topics. From my perspective it is somewhat taboo in their culture, especially for girls that are being raised by their grandmothers. I also think that the girls are definitely more apt to want to use protection than the boys and often they are pressured into not using the most readily available protection, condoms. The girls I taught that were on birth control had more open relationships with their mothers, and all received the Depo-Provera shot.

Katie, a retired teacher, was another teacher who believed in answering students’ questions. Katie believed that the abstinence education law could not be an accepted social standard and acknowledged that students were having sex:

I do not agree that our state course of study for education should even imply what is a social standard much less state as a fact and say it’s a standard for married, school age persons.... I think someone overstepped their bounds by saying it’s an expected social standard...because I know an awful lot of people that wouldn’t approve of that.... If you polled kids in high school of how many are having sex and how many aren’t...more are having sex than not...so...maybe that’s a social standard of the adults wishing the students wouldn’t have sex...but everything else on here is what I remember from teaching health.

These teachers interwove messages of abstinence education and teen pregnancy prevention in their science curriculum. Two of the three teachers taught sex education topics in anatomy and physiology classes through fear-based education. One taught these topics through a silence of the discussion altogether.
Caroline is an example of a teacher who does follow school codes and connects this to a moral responsibility. When Caroline was asked why the abstinence education code exists, she stated the following:

The feelings on that is it’s basically that they are there to protect people’s jobs…. I mean you know me talking like you said, I’ve never gotten into...I think what you are implying, that sex education, is that the nature of going through these, you know here is a condom, and here is how to use it, and anything like that um…I don’t do any of that kind of stuff. I don’t think that’s all been set up really for protection of teachers, as it should be. I would think that’s just what it sounds like to me.... You should do this, and if you do, there is a law saying you shouldn’t have done that in the first place, and...it sets up the school so they can fire them for sexual immorality.

In contrast, Bailey is not afraid of the consequences of discussing sexuality and homosexuality as an acceptable lifestyle:

If it got me fired I would be fine still especially with the homosexuality piece. I’m not ever going to tell a child that homosexuality is not acceptable....Who am I to tell that to a child who is developing their ID at this critical stage in life when...you know they are trying to feel valuable and trying to understand life and I think that this needs to be more factual like this is what happens…like actually teaching reproduction and not trying to preach.

Thus, different teachers negotiated how to teach sexuality education in different ways. Whereas some teachers perpetually told kids not to have sex and not to get pregnant, others thought more critically about the ways in which they could discuss sexuality education and the knowledge students lacked.

**Regular Versus Advanced Sexuality Education**

The teachers in one school differentiated scientific explanations of sexuality based on their perceived differences between students’ cultures. In one school, Crescent High School, different classes of students received simple explanations of sexuality in comparison to other classes. The teachers labeled these *regular* versus advanced *classes*. The students that were in the regular classes were primarily African American, whereas the students in the advanced classes
were primarily White. In the following section, I discuss the different circumstances and curricula that teachers used to differentiate sex education. The issue of pregnancy, the types of questions regular students asked, and parental influence were the main issues that differentiated the regular and the advanced classes.

For example, Amanda stated the following:

Yes, in the regular classes, when I taught environmental...or the low level anatomy or survey...these students are more interested in when can I get pregnant and when can I not get pregnant... Those are the questions they ask.... STDs, they are more interested in…. The advanced kids aren’t so concerned with STDs as with development and pregnancy prevention.

I think in the more advanced classes those students have the resources, and their parents are willing to discuss with them information about pregnancy prevention. They know where to go to get that information—the internet, the library—and they are willing to make the effort to do that.... In the lower SES, I don’t think there is a lot of factual discussion about sex and development. I think they pretty much, oftentimes the parents aren’t really at home, and the questions arise, so no one is there to answer them.

Thus, Amanda believed that regular students had different knowledge than the advanced students because of parental influence. Therefore, regular students had questions about STDs, such as, when can I get pregnant and not get pregnant, whereas advanced students were more concerned with pregnancy prevention. Amanda also thought that pregnancy was something that occurred more with regular students and was a status symbol for their culture:

If they would put the support on teaching them about birth control, which is readily available, they can go to …is it the access? I don’t think it’s the access issue...I think it’s cultural.... I think they have plenty of the access. they utilize the county health department. There are many ways they can get free birth control, but there are some cultural morays that very much influence the girls in particular into having children.

Researcher: Do you think the girls are scared of Birth control? Or just not knowledgeable?]
They may not be knowledgeable enough, and some of them may look at having a child as a status symbol and as showing that they are fertile and able to reproduce. I mean I have been told that. I am not making that up.

Amanda believed that students who were in the regular classes might get pregnant because it showed that they were able to reproduce. According to Amanda, the questions “regular” students asked in class were related to this belief:

We talk about, in fact part of the advanced placement curriculum, we have to go through the menstrual cycle and the hormones involved in the menstrual cycle and the feedback mechanisms and so, you know, we talk about that. We talk about infertility. That’s one of the topics the advanced children ask about, but the regular children rarely ask about not being able to get pregnant…. But the advanced children, they know, or maybe their mother had trouble conceiving them, and they know she used..um it could have been in vitro—I have in vitro fertilization children now—or they took medication.

Thus, according to Amanda, regular students were concerned about when they could and could not get pregnant, whereas the advanced students were concerned with complex biological topics like feedback mechanisms and in vitro fertilization.

Likewise, Liz stated that she focused on discussing good relationships with the “regular” kids, whereas she focused on the technical and functional aspects of anatomy with advanced students. She described the following statement when asked what topics were discussed in the “regular” classes:

In the regular class... if someone was telling you those things about, man you looking so good, they are just trying to get what they want, and everybody knows what they want... and you can be the one that says, see you later, and the one that is married with kids and proud of what you have done, or you can be the one with three kids before you are 18…. But you do have a choice... and a lot times they would listen, but a lot of times they wouldn’t because they were so indoctrinated into that belief that their being is based on someone else.

Liz further stated the following:

I don’t have them ask that sort of things in the advanced classes. I do talk about testing of HIV and stuff, and now there is an over the counter.... People used to go out of state and give false names.... No one said what they had... definitely about
good relationships...really about how to express affection except that when it’s
time and they do meet the person they want to be with, that will fall into place.
But I don’t really do that...and the regular class I did discuss consent sort of thing,
but in the advanced it’s more on the …structural, functional and technological end
to things.

When Liz was asked what was happening in the regular anatomy class, she stated the
following:

It’s a coach, and it’s really quiet, and it’s a whole room where the lights are out, and kids
are asleep, and a lot of them transferred to that anatomy from advanced because they
liked being in advanced, and they come back and say that it’s boring in there and more
fun in advanced…. Well my class is different. I used to teach more things.... Now I teach
how that goes together and now I teach how it’s more of the same…just a general
understanding every time they are doing a unit.

Sometimes the language of the regular students inhibited them from asking questions.

Also, in the regular and advanced classes there was a different type of curriculum. Ann also
stated that the “regular” students were definitely in need of an education about sex:

Anyone says that they are objective are wrong…. It plays a part in what you
say…. I believe in free access to information, especially kids in regular classes
who don’t have a computer at home.... *Nothing will affect those kids as much as
questions about sex and questions about money. Those are the main causes for
divorce—issues about sex and issues about money* (said with emphasis).

There was a definite concern that the “regular” students did not have the
knowledge because they did not have the access to information that the advanced
students had. Jessica stated that the “regular” students were stuck in a cycle in their
community and culture. She attributed the lack of knowledge to grandparents raising
children:

*I think it’s a southern thing.... I’ll just do what my mom says.... They don’t really
question well, what do I really think about…. I think a lot of that discovery
doesn’t happen until you go to college. And a lot of the lower SES kids will not
have that discovery…. They are stuck in...in a cycle of...their little community
and their culture...their mom had them when they were young. Some of them had
kids when they were young…. There is not a father there.*
I don’t know where they get it from.... Another interesting thing...a lot of the Black girls in these classes, they refuse to wear tampons.... I don’t know why...they wouldn’t.... I don’t know the details but I know I overheard a discussion about not using tampons.... I thought that was strange…and the only thing I could think of...and maybe this is crazy…or maybe I am making a classification of a culture of people, [but] I feel like a lot of them are raised by their grandmothers...and when their grandmothers were of age there were not any tampons.... That’s why they don’t use them.... They don’t like the grandmothers going to buy the stuff.

These teachers who attributed their lack of knowledge to their cultures also discussed how lower SES were stuck in a cycle of poverty. These students were already placed into differentiated classes, therefore their social circumstances were readily identified.

Jessica discussed how the Black students had misconceptions about condoms because it was taboo to discuss sex in their culture:

They literally were told by someone that the virus was too small...and it would go through the condom, and there wasn’t any point of wearing them.... I think that especially with the kids I am working with...I mean these are all Black kids...and the majority of them are lower SES...and I think it’s just a huge stigma in that culture for them to talk about sex…. I mean they don’t talk about it…and what they know is just what they figure out, and they won’t ask anyone about it.... I think that they were partially told that misconception and that was just, oh well, I’m going to accept that because condom makes sex worse, so I’m going to not wear one and keep this going, you know what I mean.... I think that there is just a lot they didn’t know.

Another teacher, Caroline, described how the lack of a parental figure in the lives of lower SES students contributed to higher pregnancy rates:

If you ask what the kids are asking that does come into a socioeconomic thing. I’m just going to tell you the lower SES kids ask totally different questions, because apparently they do use the method of counting the days and they don’t even know when they start. I mean honestly, I’ll give you an example. I was teaching biology. One of the questions was they thought you start counting after your period. No no honey, it’s the day of they day that it starts...day one.... No wonder their teen pregnancy rates…. They have no idea...and they don’t understand…. Now that’s strictly hormonal...and they don’t know what ovulation means. They don’t have a clue what that is. I was like, oh my gosh, no
wonder...and so that could be for some reason it is that the higher SES kids seem to have had a parent tell them something, whereas I don’t think the lower SES kids have, and being as it may, the makeup of the lower SES...I try not to generalize, but in general the only way of, you know, it is what it is. There isn’t a parental figure to have that discussion with them.

In a follow-up interview, Caroline maintained that lower SES students wanted to be pregnant because of the ease with which they received assistance from welfare offices:

Moms don’t teach and aren’t there to teach the kids in the first place.... The wealthier children do make sure they know...about birth control. Yeah, it’s unacceptable in their culture...it’s prestigious...girls pregnant by a certain age.... It’s like a prize.... Boils down to cultural thing. They want to be pregnant. They want the babies.... It comes down to, as a culture we have made it easier for the program with families, and they can bring home more money...make it fairly easy for them.... And in the name of the culture...I pay for their formula.

For Caroline, public assistance was a reason that lower SES students got pregnant. Jessica discussed how her difference as a White woman affected her discussion on birth control. She believed that if the “Black” students had a young Black teacher, they might be more open to a discussion:

I don’t think they feel comfortable asking questions, and my experience...like... I’m a young White girl and I’m in a classroom with all Black students.... Most of them...from lower SES backgrounds, like they know all of them ride the bus, all of them know I drive a nice car, and like I’m married and have a husband. Then I think that it really took me probably...most of the semester to get them to be on my side...for them to trust me...and so I think that a lot of it is that...I feel like if teachers were more diverse...that they might be more...open to discussion.... Like they might feel more comfortable going up to a young Black teacher and talking about it than with me.... I don’t know maybe that’s just my thinking.

The use of differentiated curriculum in the regular students versus the advanced students was a regular occurrence in one school. The teachers in this school had the belief that African American students needed more basic knowledge about sexuality education, relationship education, STDs, and pregnancy prevention. The beliefs of the teachers about the students in a “regular” classroom affected explanations of sexuality education.
Often, teachers reserved more complicated conversations about reproductive technologies for the advanced classrooms. Thus, they used scientific language in very different manners in the different classes that they taught.
CHAPTER 5

CONCLUSIONS

The Double Bind of the Nature of Science

The purpose of the nature of science is to push the boundaries of science beyond the acquisition of knowledge in order to ask how scientific processes occur. More recently, the nature of science has shifted from understanding how scientific knowledge originates to communicating facts to students. If the goals of science education are to help students engage in public discussions on science related issues and to be critical consumers of scientific information, as indicated by the new Framework for K-12 Science Education (National Research Council, 2012), then a discussion of issues that are controversial is necessary to this task. As Sidler (2009) stated, teaching about biotechnology involves the social and emotional situatedness of the self and brings private discussions into public discourse. It requires that we engage with the cultural complexities of reproductive technologies, for example. Similarly, science educators have recognized the need for the moral and ethical development of students through the incorporation of socioscientific issues. Feminist science educators, like Harding (2006), asked whether Western sciences have a “political unconsciousness.” Harding argued that current science is supposed to be value-neutral and add no social, political, or cultural features to the representations that they produce. Yet, critics point out that racism, male supremacy, class, and colonial and imperial domination still persist (p. 4).

A discussion of sexuality education and its scientific processes necessitates an understanding of the complex processes of the human body. Students used the nature of science
to ask how scientific processes of sexuality occurred. Teachers, however, were caught in a multiplicity of discourses: student’s questions, morality discourses, and their own beliefs about how scientific knowledge informs discussions about sexuality education. The power in these discourses affected how knowledge was circulated. Smaller micromechanisms of power defined, recirculated, and repressed particular discourses such as abortion and the discussion of the act of sex and disease. Even still, resistance happened when teachers discussed the choice of abortion, and when other teachers had complex discussions about STDs, different acts of sex, contraceptive use, and pleasure. These teachers recognized that these seemingly private discussions were complementary to an understanding of how scientific processes occur.

However, other teachers perpetuated misinformation that was masqueraded as scientific fact. The costs of not providing students with accurate and comprehensive knowledge, however, can be misleading and risk students’ future sexual health.

In this chapter, I discuss the ways in which sexuality proliferated in the different discourses of the science classrooms and how these discussions both perpetuated the misinformation of scientific knowledge and opened up conversations about sexuality in life science classrooms. I discuss the complications involved in a discussion of sexuality education and the risk that a loss of discussion has on the future sexuality health of students. Lastly, I discuss the implications for teacher education and explanations of socioscientific issues.

This study analyzed how life science teachers make pedagogical decisions about sexuality education. I studied how teachers negotiated contradictions between what they know and what they are allowed to teach regarding sexuality. Following this line of questioning, I analyzed the discursive practices of teachers based on the influence of discursive structures of power and knowledge. Foucault stated that the deployment of sexuality is “proliferating,
innovating, annexing, creating, and penetrating bodies in an increasingly detailed way, and in controlling populations in an increasingly comprehensive way” (p. 107). This study confirms that far from being absent, the “deployment of sexuality” also occurs in life science classrooms through missing and taboo discourses, the discourses of students, and in ways teachers constructed pedagogy.

**Language of Obstruction and Opportunity**

Teachers used the power of scientific language to mask and enable conversations about sexuality education. Most teachers would require students to discuss sexuality education in scientific terminology, even though they knew students had very limited scientific vocabularies. One teacher, Caroline, maintained a strict division between sexuality education and scientific explanations of sexuality because she did not believe she should teach sexuality education. Thus, most teachers used scientific language as a barrier to obstruct complex scientific explanations of the act of reproduction, disease, and other topics.

Teachers rarely translated the knowledge that students possessed into usable scientific terminology. However, two teachers, Katie and Jessica, did understand the importance of translating students’ language. For example, when a student asked Jessica about “going down on a girl,” she answered this question with appropriate language, instead of avoiding the question. Likewise, Katie used a sex box, an answer box, to allow students to ask any question they wanted. She then translated their questions into scientific terms and had complex discussions about how the act of sex occurred. Very few teachers decided to mediate this discussion and offer students explanations of sexuality in scientific terms. Thus, the decisions of teachers masked and enabled conversations of sexuality and formed the basis on which teachers made pedagogical decisions.
Misinformation and Resistance in Pedagogical Strategies

Two teachers, Jessica and Liz, discussed sexuality education in vastly different ways. Jessica moved beyond the official sex education curriculum when a student told her he believed that the HIV virus was too small and would go through a condom, therefore it was better not to wear a condom. Jessica went into a lengthy discussion of HIV structure, function, and transmission and how this occurs in different forms of sex. She explained how a discussion of anal and oral sex was needed in order for students to understand its mode of transmission. Likewise, Katie used her sex box to answer questions that students had, such as whether or not they could get pregnant through oral sex. She explained that this required an explanation of how pregnancy occurred and the anatomy and physiology of the body.

Other teachers, like Amber and Amanda, kept a distance between themselves and discussions of the act of sex and disease. Amber and Amanda asked nurses to explain how STDs were spread, whereas other teachers, like John, strongly encouraged students to be their own educators. These educators were unsure of their place in this discussion and were more comfortable asking questions that did not involve the act of sex. Although these teachers maintained a distance, other teachers perpetuated misinformation of sexual knowledge.

Two teachers, Liz and John, discussed sex in terms of not having sex. Liz carefully discussed disease without discussing alternative birth control methods, their effectiveness, alternative forms of sex, and STDs. In an epidemiology lab she incorrectly allowed students to assume that any situation would result in them contracting STDs. Liz explained abstinence education through the story of sally and mark, who obtained an STD because they had sex with multiple partners. She failed to discuss sex other than in a heterosexual manner between two people who were married. She also propagated erroneous information that could be potentially
harmful to students. Liz failed to inform students about the complexity of sex in relation to the use of contraceptives and the act of sex and without infusing shame for having sex with multiple partners.

Another teacher, John, also used fear and shame to discuss pregnancy prevention. In an embryonic unit, he emphasized that students’ bodies were not physically mature enough to handle pregnancy. He also stated that these children might be born disabled, therefore students should not engage in sex. John used his authority as a science teacher to perpetuate knowledge that is not scientifically accurate. John chose to support the abstinence education method and instill a fear of pregnancy in his students. Instead of discussing the complexity of the act of sex, abortion, and the choices students had, he severely limited the knowledge that students possessed about themselves. The implications of this are that students remained unknowledgeable about their bodies and their choices to have sex and prevent pregnancy. Without a functional scientific language to understand sex, he re-inscribed sex as fearful, dangerous, shameful, and mysterious.

**Counter Discourses of Students and Teachers**

One common method used by students was to “count the days” for gauging the best time to have sex. Most teachers knew that this was not the best method to avoid pregnancy, but very few teachers discussed alternative methods or explained why this method was ineffective. Amber stated that she discouraged this practice, whereas Caroline informed the students that it was the day after your period that you counted the days until you could engage in sex. In all of the examples, the students felt confident that they knew a good method for gauging an appropriate time to have sex. Even while teachers largely discouraged this practice, they failed to offer complex explanations of how ovulation occurred, how birth control was the most effective method, and how birth control functioned in relation to male reproduction. In other words, they
failed to help students have faith in scientific knowledge of reproductive technologies and complex understandings of the body. Thus, the failure of science teachers to use scientific language to offer counter discourses put students at risk for disease and pregnancy.

In contrast, Katie constructed a sex box to translate students’ questions into explanations about sexuality education. Because students were also shameful about asking questions, this offered an opportunity for students to anonymously ask questions and get explanations of these concepts with scientific and accurate answers. Students who believed they might go blind if they masturbated, and other students who did not understand whether or not they could get pregnant through anal sex, received accurate scientific explanations of the body. Katie translated their questions and explained this in terms of sexuality as a scientific process. Her sex box, similar to the one that I created, offered students an opportunity to ask questions that related to scientific knowledge and accurate explanations. In contrast to the counting-the-days examples, Katie offered complex explanations that explained the “how” of scientific knowledge in a way that made students scientifically literate about their own bodies and confident, through scientific knowledge, about their sexual practices.

**Taboo Knowledge: Abortion and Homosexuality**

**The Missing Discourse of Abortion**

Abortion served as an invisible and hypersensitive topic that most teachers failed to discuss. Ironically, although teachers largely encouraged the prevention of teenage pregnancy, a discussion of abortion, and the choices students had once they became pregnant, were rarely discussed. Different teachers discussed this sensitive matter in different manners. For example, Liz discussed the Hippocratic Oath as a method of discussing abortion. She emphasized that physicians made an oath not to perform abortions. Another teacher, Caroline, explained that it is
against the course of study to discuss abortions. I researched this and found no prohibition on a discussion of abortion in life science classrooms. One teacher, Leslie, did discuss abortion because she wanted students to be able to make choices with the knowledge they had. She cited that her work in a welfare office contributed to her choice to discuss this controversial topic with students, especially as it concerned the thin line between abortion and murder.

Alternatively, teachers could have easily incorporated this discussion into fetal development and the use of reproductive technologies, like Plan B and RU 486. Without the knowledge of abortion as a safe medical procedure couched in a scientific understanding of what occurs, students might make the choice to undergo this procedure. If teachers discussed how pregnancy could be prevented through safe, reliable technologies, students could prevent pregnancy in the first 72 hours with Plan B or within the first 9 weeks of pregnancy with RU 486. Instead, this knowledge was missing, and students might have believed that they had little choice in their pregnancy. These same students could avert the fear, shame, and stigma of being pregnant when the mystery behind the medical and scientific procedure is taken away and educators discuss this as normal procedures that women undergo. According to Shiebinger (1999), if a history of gender and women’s roles in sexuality were also discussed as part of the reproduction unit in biology, one could discuss the decline of midwifery, its benefits, and the decline of midwifery for contraceptive uses. In 1600, women had access to over 200 kinds of contraceptives and abortifacients that were of a vegetable and mechanical nature. The demise of modern midwives and shift of control to obstetricians effectively removed women from support systems (pp. 109-110).
The Missing Discourse of Homosexuality

Another taboo topic that affected the well-being of students was homosexuality. Sex education discourses proliferated when the school culture was hypersensitive to its presence. For example, Bailey discussed that when her fellow teachers took students to the bathroom, the teachers would tell the boy students they might be gay if they did not get out of the bathroom quickly. In this example, teachers inserted their power to enforce school cultural norms to repress homosexuality. Instead of a repressed sexuality, modern society has contributed to a proliferation of discourses concerning sexuality. As Foucault (1978) stated, “We must therefore abandon the hypothesis that modern industrial societies ushered in an age of increased sexual repression. We have not only witnessed a visible explosion of unorthodox sexualities...but the proliferation of specific pleasures and the multiplication of disparate sexualities” (p. 49).

Similarly, in life science classrooms, sex may seem repressed, but the discussion of sexuality reappears in students’ questions and teachers’ responses. It is here that power circulates and reappears in the form of student questions. Much of the discussion on teen sexuality supported heterosexual marriage, thus queer identities were silenced. There was an unstated code on how to discuss queer students, first in the realm of curriculum, and secondly in the school culture. Teachers in this study often cited male–female dichotomies when explaining scientific concepts. If the discussion of queer students was brought up, it was in terms of a genetic cause of “homosexuality.”

Four teachers in this study attributed homosexuality to a genetic origin. The teachers who were the most understanding of queer students were still hesitant to address issues of student identity that were not heterosexual and would still attribute their condition to genetics. Leslie’s religious beliefs directly influenced her condemnation of homosexuality. She changed her views
after she retired, however she also held on to the belief that homosexuality was explainable and determined. John discussed how he steered students away from homosexuality and conflated homosexuality with STDs. Science was treated as a “truth” that could serve to reverse abnormal conditions such as homosexuality. Students that were queer were never given a chance to be included in the curriculum because they were discussed as associated with diseases or unacceptability. The power of scientific language was used in these examples to perpetuate myths about homosexual behavior.

The abstinence education code supported this doctrine because it specifically stated that marriage is the acceptable time to have sex. Because the only type of marriage sanctioned by this state was a heterosexual marriage, queer students were left in silence about their sexual practices and attending scientific questions. Therefore, Liz used the power of science and critical inquiry to situate queer individuals as explainable.

In these science classrooms, the combined understanding of attributing a genetic basis to homosexuals and the unsupportive culture of homosexuality in the abstinence education, rendered them explainable by most teachers. This is where knowledge and power of the culture intersect to produce certain discourses about queer students, such as that it is genetic. By discussing queer students as explainable, they were regulated as a phenomenon, not as an acceptable alternative sexual lifestyle. Thus, the power of the homophobic and heteronormative environment was reproduced in the classroom. There were little explanations of intersexed individuals, and LGBTQ populations in the curriculum of the textbooks. Bailey did recognize this environment and resisted the power of the homophobic culture. However, she was also hesitant to get into an explanation of intersexed individuals. The power of heteronormative
discourses may have prohibited her from going into explanations of intersexed individuals, even though she was very open to queer rights.

Likewise Foucault (1978) discussed the “pedagogization of children’s sex,” which asserted that all children were prone to sex and this posed “physical and moral, individual and collective dangers” (p. 104). Educators, doctors, and parents took control of children’s sexual activities. In addition, through the “psychiatrization of perverse pleasure” the “sexual instinct was isolated as a separate biological and psychical instinct” (p. 105). Similarly, sexuality is discussed in science classroom as something to be classified, studied, and determined through a genetic basis. In my study, sexuality was determined as a object of inquiry that was deviant from heteronormative practices. Here, the topic of sexuality was deployed in the curriculum and in the behaviors of the school culture as deviant and in need of discussion.

Although a discussion was disallowed in these contexts, a queer pedagogy can offer alternative methods of discussing scientific phenomena. Broadway (2011) explained that there has to be a difference between a queer curriculum and a queer pedagogy. If a queer curriculum is the conversation between the reader and the text, a queer pedagogy is how knowledge is produced in the interaction between reader, text, and teacher. According to Broadway, being queer is actively transforming or creating space by shattering boundaries and participating in revolutions, and sexuality is the space where transformation can occur (p. 301).

Similarly, Fausto-Sterling (2000) discussed that although there is merit in maintaining a two-sex system for the state and legal systems, our biological bodies do not conform to this. She argued that there are many bodies that mix anatomical parts together on a sexual continuum. Fausto-Sterling stated that if nature does offer more than just the two-sex system, then our current ideas of masculinity and femininity are cultural conceits. She also stated that steroid
hormones have typically been considered markers of sexual difference; however they could simply be considered growth hormones that affect a wide variety of tissues, including reproductive organs. Thus, our understanding of hormones and sexual difference is constructed through historical and cultural texts.

According to Butler (2006), the language of biology participates in the cultural sedimentation of the objects it supposedly describes as neutral. Thus sex determination comes from issues that surround social organization of sexual reproduction through the construction of the positions and identities of sexed bodies. According to Butler, signification takes place from a compulsion to repeat; agency is located in the possibility of variation on this repetition. Her goal was to displace the gender norms that enable this repetition. She stated that they operate through normative injunctions that qualify what intelligible sex is and consolidate reproductive constraints on sexuality. In the biological sciences, the sedimentation of sexuality can be analyzed so students can evaluate how sexuality is determined. Some feminist educators argue for this analysis in the evolutionary adaptation of organisms.

Lloyd (1993) raised the question of why autonomous female sexuality has been traditionally left out of biology. Many researchers believe that female peak sexual interest occurs at peak fertility. This evolutionary adaptation argument supports the idea that the male and female pair bond evolved together for better chances of survival and reproduction. However, other research points to the fact that nonhuman primates have observed orgasm when they were mounting other females; thus orgasm is a potential that, if the female receives the right stimulation, is activated. According to Shiebinger (1999), this nonadaptive view of orgasm could lead to an emancipatory understanding of its potential; thus it can be used any way people want, and there is no “natural” restriction on its use. This alternative way of discussing orgasm, for
example, could offer biological understandings of sexuality and a more critical understanding of the body’s processes.

**Social and Cultural Pedagogy**

Another missing discussion that stemmed from this study was the issue that conflated teenage pregnancy and women’s bodies with that of students’ ethnicities. Many teachers held stereotypical views about certain students who represented a “status symbol” of pregnancy. They conflated teen pregnancy with students who were primarily African American and purposefully differentiated sex education based on these characteristics. Teachers failed to understand the underlying social and political circumstances of these students who contributed to their high pregnancy rate, and what is more, failed to teach them a comprehensive knowledge of their bodies. Many students, because of the teachers’ perceptions, failed to receive a comprehensive knowledge of sexuality education.

According to Foucault (1978), “a political power over life evolved in the seventeenth century” (p. 140). The first pole centered on the body as a machine, so that is was both useful and docile and was integrated to economic controls. He termed this the *anatomo-politics* of the human body. This in turn, was an important component in the development of capitalism and the maintenance of production relations (pp. 140-141). He stated that the rudiments of anatomo- and bio-politics function as techniques of power used in schools, police, and the family. These also guaranteed relations of domination and social hierarchization (p. 141). The students in two schools in this analysis were subjected to a differentiated sex education curriculum, and for the “regular” students one that was focusing on relationship education and the push to not have sex. The schools blindly reproduced the relations of domination by blaming their lack of knowledge to their social circumstances without considering how they had already been politically and
socially exiled by the differentiated classes they were placed in. The teachers that believed students were in this cycle of poverty and that students wanted to get pregnant were not politically conscious of their own motivations but unconsciously used their power and knowledge to reproduce relations of domination.

As Harding (2008) stated, where there are societies of substantial economic and social stratification, women, minorities, and the poor will be devalued and excluded from opportunities to engage in science. Even when their voices are included, it has been easy to keep their voices silenced (Harding, 2008). When teachers are politically conscious of their teaching methods, they can better interrogate normalized ways of teaching.

**Language and Bodily Knowledge**

The paradox is that the life science classrooms are the best place to discuss bodily knowledge; however discussion is inhibited because teachers maintain a distinct separation between “sex education” and “reproductive biology.” If students do not understand scientific concepts such as the mechanisms behind birth control in conjunction with the female reproductive cycle and the male reproductive cycle and ejaculation, they are disinclined to believe that birth control methods are safe and effective. These missing conversations necessitate that a scientific language be present to help students understand how scientific concepts and sex education concepts are related to one another. For example, most teachers were not inclined to discuss condoms and their use. Thus, students rarely received a comprehensive knowledge of sex education, and what is more, young women bore the responsibility for being chaste and knowing about birth control.

Caroline, for example, discussed how she was comfortable answering students’ questions. Although she professed to discuss any questions students asked, in reality she had
boundaries she would not cross, including discussion of condom use and different forms of sex. In fact, she felt teachers who did go beyond the abstinence education code could be fired for sexual immorality. For Caroline, reproductive biology was a separate conversation from sex education, and she maintained this distinct separation because of the abstinence education code.

Likewise, Scholer (2002) stated that biology textbooks have traditionally represented a mechanical approach to sexuality and implied that sexuality was only for reproductive purposes. This sidelines any discussion of people who are nonheterosexual and who are on birth control (p. 83). Elliott (2003) suggested that separating the genitalia from the body can lead students to think that sex is something done to their bodies not to them. Instead, we need to seek positive approaches where sexuality and reproduction are integrated. In the approach used in Finland, sex education is integrated into health education and biology classrooms, and the lowest educational objective is educating for abstinence education because these teachers assumed that the students were responsible enough to take care of their own sexual issues (Kontula, 2010, p. 380). However, the lack of complex explanations in reproductive biology and the act of sex leave students with very limited understandings. Liz misrepresented scientific language by giving them human characteristics. Liz explained the uterus as the “happy uterus” and used laughter to evade scientific discussion about the human body. When students laugh at their bodies, they also failed to take these understandings seriously and as a knowledge they can use in the future.

Similarly, Martin (1991) discussed how language is central to a discussion of reproduction and influences an understanding of controversial concepts like abortion and sexuality. She discussed how misrepresentations of the egg and sperm can lead to language that represents them as endowed with “livable” characteristics. She also stated that endowing biological artifacts with cultural attributes like personalities can be problematic. Martin stated
that the egg is typically constructed as a passive, feminine construction that depends on the sperm for rescue. She stated that the sperm have “masculine” characteristics as active and powerful, and the egg is typically “feminine” and described as large and impassive (Martin, 1991, p. 106). However, if we endow sperm and egg with intentional action, a key aspect of personhood in our culture, it lays the foundation for viability being also pushed back to the point of fertilization. This can lead to greater acceptance of technological innovations and greater scrutiny of this inner “person.” Endowing cells with “personalities” could lead to disturbing social consequences, given the advances in technology, and this could have implications in amniocentesis and abortion rights (pp. 113-114). Instead, scientific language can be used to dispel misconceptions about the human body.

**Implications**

Scientific knowledge remains in the double bind as it concerns the nature of science. It claims to maintain objectivity yet science is situated in the everyday decisions people make about their bodies. Science has traditionally been masked as objective and interested in communicating facts, therefore it can be “politically unconscious,” to use Harding’s (2006) term (p. 113). Harding stated, “Women, the poor and ethnic groups around the globe need more reliable information about the threats to health and life that they face daily” (pp. 120-121). Although the nature of science is often misrepresented as being “objective,” science teachers can describe the “how” in scientific processes to explain the complexity of sexuality education in our bodies. If sex education was related to disease, pregnancy, and the act of sex, all of which are related to the human body, sexuality education can be easily incorporated into life science classrooms. Life science teachers negotiate decisions about the discussion of sexuality education from many factors: the course of study, pressure from parents, abstinence education,
administrators, and their personal beliefs. However, if science teachers use the nature of science to explain how complex scientific processes of the body occur, teachers can situate discussions of sexuality in squarely scientific and medically accurate information that takes the nature of science into account.

The proliferation of discussions of sexuality necessitates that students understand concepts in relation to one another. This can occur if the functional language of sex and reproductive biology are taught in conjunction with one another. However, students are likely to construct their own knowledge if they do not have other competing discourse to counter their misconceptions. The counting-the-days method of birth control for girls is not scientifically accurate and is a self-taught method for gauging the best times to have sex. If students do not have alternative knowledge, they do become pregnant and have few options when other discourse has been repressed. Similarly, if specific content, such as abortion, is labeled taboo, their decisions regarding their health are also limited.

The new generation of science education standards is based on the new Framework for K-12 Science Education (National Research Council, 2012). There is a growing call to educate students to be prepared as citizens in a technologically and scientifically rich world. However, science is taught without the implications of social circumstances, thus it remains an archaic collection of facts that do not represent contemporary contexts. If science as a discipline wants to function to create a scientifically literate public, then discussions of the “private” realm that intersects with discussions of the body need to be had in terms that are scientifically appropriate. Teachers that discuss concepts of sex education in medically accurate terms and in a scientific manner can have productive discussions about sexuality that students can critically discuss in the future. Similarly Ivinson (2007) called for reconceptualizing sex in its subversive potential. If
teachers harness the pedagogic potential of scientific language and concepts to counter myths about sex education, they can also teach students an understanding of scientific discourses to their personal experiences of sexuality.

**Socioscientific Issues**

Socioscientific issues, or issues that consider the moral and ethical development of the students in relationship to an issue in science education, have become an important area of research. According to H. Lee and Witz (2009), top-down reform through SSI, STS, or the nature of science is not likely to cause teachers to change their teaching practices. However, if we can understand the motivations, personal stories, and deeper values and ethics teachers have, then teachers can begin to reflect on their beliefs. Similarly, if teachers can reconceptualize their philosophical and epistemological relationship to science, in consideration of the nature of science, they may be able to be reflective in their own practices. For example, if teachers discuss contraceptives as reproductive technologies that students may have to make decisions about in the future, sexuality education can be discussed in terms of critical knowledge for scientific understandings. Thus, this research points to the need for teachers to reflect on the ways that they use scientific language and how they relate this to how science occurs.

In addition, the teachers in this study had many mediating factors as to why they would or would not discuss issues that were controversial. Resources and time were crucial, but so was paying attention to the contextual variables that influence teacher decision making, such as the biases based on gender, race, socioeconomic class, and the issue itself. Thus, research can call on a focus to resolve specific controversial issues in the context of their social, cultural, and political implications to discuss the nature of science in relation to these decisions.
Teacher Education

If more teacher education programs focused on critical reflection of what the nature of science means to them and how they would discuss scientific processes, teachers might understand a discussion of sexuality as involved in the scientific and technical processes of science. For example, it might be difficult for students to see the holistic picture of how conception, birth control, and ejaculation occur in conjunction with one another. Teacher education programs can explain how to discuss this mechanism in scientifically and medically accurate ways. Thus, teachers would be more willing to incorporate issues, once they were directed in the information and method of delivery.

Language and the complexity of scientific explanations were barriers for students. Science teachers can gradually introduce the language of sex education from common terminology that students understand in order for them to connect to medically used terms. Teachers could use resources such as *Our Bodies, Ourselves* to help explain body parts in students’ common language. This book offers an explanation of the anatomical names, common names, and the function/role of body parts, including drawings to explain their location.

Thus, teacher education programs can serve to encourage teachers to teach students unit plans on reproduction that provide students with a holistic picture of sex and reproduction. Labs, such as the epidemiology lab discussed previously, can be reconstructed to discuss the transmission of disease in accordance with different acts of sex and the mechanisms in which this occurs. In this way, future science teachers can reconceptualize sex education to overlap with reproductive biology and the nature of science in sexuality.

Other researchers call for the addition of medically appropriate models, so that students can understand how contraceptives can prevent STIs and conception from occurring. This could
also help students know where body parts are located and their structure and function in basic anatomy classes. Y. C. Lee (2002) suggested that 3-D representations of human reproduction can function to see reproduction in action, which can serve as a basis for the discussion of contraceptive use and birth control devices. Models such as these can be used to counteract misconceptions and engender more student questions about the processes of sexuality in reference to the structure and function of sex education, questions about how birth control mechanisms function, and questions about sexuality for healthy sexual futures.

Conclusions

The themes discussed in this chapter state that scientific language can mask or enable discussions of sexuality education. Teachers need to analyze their philosophical commitment to the nature of science in order to understand how sexuality education is fundamental to the processes of science. Even as students cannot speak for themselves in an adult space, they do have fundamental human rights that grant them access to scientific language and medically accurate information. Especially in a space of a science class, youth can learn to evaluate knowledge and scientific evidence and come to their own conclusions.

However, the “political unconsciousness” of science still exists, largely because there is a disconnect between the role of the nature of science, controversial issues, and how this knowledge originated. Students need to be able to evaluate multiple worldviews and perspectives about issues such as abortion, teenage pregnancy and contraceptive methods, and newer reproductive technologies. In this way, a discussion of sexuality education can be redescribed not as sex education, but as an interrogation into the manifold knowledge that comprise an education about the human body.
Some teacher researchers point to “inner motivations” and “deep rooted ethics” as the driving force of teachers’ decision making. However, in order for teachers to change their practices regarding controversial issues, they must be conscious of the ways they actively reproduce sexuality discourses in life science classrooms. In this way, teachers can produce alternative discourses that resist common assumptions. Some teachers show contradictions in the ways that they hide this discussion in scientific language. These teachers may use scientific language to hide this discussion or produce alternative discourses like the teacher that actively discussed abortion. Thus, future research can focus on the ways that life science teachers use scientific language to resist the unconscious reproduction of knowledge that is not informative to students’ lives. If science teachers can discuss contraceptives as reproductive technologies, for example, they can create alternative discourses that make them politically, morally, and socially conscious to the needs of students.
REFERENCES


APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL
August 14, 2012

Puneet Gill
ELPTE
College of Education
Box 870302


Dear Ms. Gill:

The University of Alabama Institutional Review Board has granted approval for your proposed research.

Your application has been given expedited approval according to 45 CFR part 46. Approval has been given under expedited review category 7 as outlined below:

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Your application will expire on August 13, 2013. If the study continues beyond that date, you must complete the IRB Renewal Application. If you modify the application, please complete the Modification of an Approved Protocol form. Changes in this study cannot be initiated without IRB approval, except when necessary to eliminate apparent immediate hazards to participants. When the study closes, please complete the Request for Study Closure form.

Should you need to submit any further correspondence regarding this application, please include the assigned IRB application number.

Good luck with your research.

Sincerely,

[Signature]

Carpanktio T. Myles, MSM, CIH
Director & Research Compliance Officer
Office for Research Compliance
The University of Alabama
APPENDIX B

PARTICIPANT DEMOGRAPHICS
<table>
<thead>
<tr>
<th>Teacher</th>
<th>Race</th>
<th>School Name</th>
<th>Experience</th>
<th>Subjects Taught</th>
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<tr>
<td>Amanda</td>
<td>White</td>
<td>Crescent High School</td>
<td>33 years</td>
<td>Advanced Placement Biology, Chemistry, Regular Biology, Advanced Biology, Anatomy and Physiology, Marine Biology, Physical Science</td>
</tr>
<tr>
<td>Ann</td>
<td>White</td>
<td>Crescent High School</td>
<td>20 years</td>
<td>Biology, Anatomy and Physiology, 7th-grade life science</td>
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<td>Liz</td>
<td>White</td>
<td>Crescent High School</td>
<td>34 years</td>
<td>9th-to 12th-grade biology, Human Anatomy and Physiology</td>
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<tr>
<td>Caroline</td>
<td>White</td>
<td>Crescent High School</td>
<td>16 years</td>
<td>Advanced biology, Zoology, Chemistry, Advanced Placement Biology, Anatomy and Physiology</td>
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<tr>
<td>Jessica</td>
<td>White</td>
<td>Crescent High School</td>
<td>4 years</td>
<td>Regular level biology, Honors Biology, Environmental Science</td>
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<tr>
<td>Katie</td>
<td>White</td>
<td>Retired</td>
<td>14 years</td>
<td>Integrated Science, General Biology, Advanced Biology, General Biology, Technical Biology</td>
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<tr>
<td>Name</td>
<td>Age</td>
<td>School</td>
<td>Grade</td>
<td>Subject(s)</td>
</tr>
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<td>----------------------</td>
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<td>------------------------------------------------</td>
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<td>Leslie</td>
<td>Retired</td>
<td>20 years</td>
<td>7th- and 8th-grade science Biology Physical Science Chemistry Anatomy and Physiology</td>
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<tr>
<td>John</td>
<td>Ridge High School</td>
<td>22 years</td>
<td>Anatomy and Physiology Life Science Physics Chemistry</td>
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<tr>
<td>Amber</td>
<td>Dover High School</td>
<td>12 years</td>
<td>6th-Grade Earth Science 7th-Grade Life Science 8th Grade Physical Science 9th-/10th-Grade Biology 9th-to12th-Grade Science Electives:  - Botany  - Zoology  - Anatomy &amp; Physiology  - Forensic Science</td>
<td></td>
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<tr>
<td>Judy</td>
<td>Juniper Middle School</td>
<td>34 years</td>
<td>7th-grade life science Physical science Environmental science</td>
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<td>Crawford</td>
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<td>7th-grade physical science 7th-grade life science</td>
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<td>Bailey</td>
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<td>2 years</td>
<td>7th-grade life science</td>
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</tbody>
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APPENDIX C

INTERVIEW QUESTIONS
Interview Questions

a. How many years have you taught science?
b. What science courses have you taught? What grades?
c. What is your age/gender?
d. What region(s) did you teach in? (Southeast, north, west or northeast etc.)

1. General Question:
Can you describe in what ways has sex education (STDs?, HIV?, The reproductive system? (ovulation, spermatogenesis), the act of sex Other topics? (abortion, birth control, contraceptives, the act of sex) been a part of your teaching experiences?

Are these topics a part of your curriculum? If so, how? What is your perspective on these topics in a science classroom? Why?

2. You teach (inset subjects they have taught). Can you take a look at the standards and describe how you construct lessons around this topic?
   - Do you use any supplemental activities, exercises or information to this?
   - Are students generally interested in this content?
   - What are major deciding factors to teach your curriculum in this manner?

3. Can you describe a situation where the topics of sex education came up in your classroom. How did you handle this situation?
   - What do you consider taboo topics in your classroom related to sex education?

4. How do you make decisions about what you can/cannot talk about? What influences those decisions?
   - Colleagues? School policy?
   - Number of years teaching?
   - Events that happened in the past?
   - What are your personal beliefs on the matter?

5. What are policies which govern how sex education is taught in your classroom? In your state?
   - Alternatively is there a lack of information on policies?
   - Do you feel teachers follow these policies?

6. How did your teacher education courses – particularly science education courses prepare you to teach sex education at the high school level? Was there any discussion about the body in these teacher education classes?
   - Was there any training on controversial topics?
   - What did your teacher training courses focus on?
- What do you wish they would have included now that you are an experienced teacher?

7. Have students asked questions concerning sex education in your classroom? If so, how did you discuss these questions?
   - What are some topics students bring up? How do you handle these conversations?
   - Are any constraints in answering these questions?
   - STDs?, HIV?, The reproductive system? (ovulation, spermatogenesis)
   - Other topics? (abortion, birth control, contraceptives, the act of sex)

8. How have your colleagues incorporated sex education in their curriculum?
   - Do you teach similar approaches? Why or why not?

9. What suggestions would you give to teacher education programs to help teachers navigate this?