

BIG DECISIONS: FACTORS INFLUCENCING CURRICULUM

FIDELITY OF A SEXUALITY EDUCATION

CURRICULUM IN

PUBLIC SCHOOLS

by

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I: INTRODUCTION

Introduction

The purpose of this study is to examine the factors affecting curriculum fidelity in the teaching of the sexuality education curriculum *Big Decisions*. This study will also explore secondary school teachers' attitudes and beliefs about sexuality education, perceived subjective norms about sexuality education, perceived classroom control, and perceived self-efficacy in teaching *Big Decisions*. A survey will be used in conjunction with classroom observations to measure the affect these variables have on curriculum fidelity. The Theory of Planned Behavior (Glanz, Rimer, & Viswanath, 2008), with an added self-efficacy construct, will be used to guide this study. The Theory of Planned Behavior (TPB), in its entirety, addresses concepts applicable to understanding secondary teachers' attitudes about sexuality education and intention to implement the *Big Decisions* curriculum with fidelity.

Rationale

Research by the Centers for Disease Control and Prevention (CDC) shows 45.9% of high school students in Texas have had sexual intercourse at least once and over 60% have had sex by the 12th grade. Of sexually active teens in Texas, 14.9% have had sex with four or more partners, 47% did not use a condom the last time they had sex, and 79.6% did not use birth control. Furthermore among sexually active youth, 93% did not use a condom and birth control together the last time they had sex (Frieden, Jaffe, Cono et al., 2014).

Kirby (2007) identified curriculum fidelity as one of the 17 characters of effective sexuality education curricula. When taught with fidelity, some sexuality education

curricula have been shown to delay the initiation of sex, reduce the number of sexual partners, and decrease the frequency of sex (Kirby 2008; Kirby and Laris, 2009; Zimmerman et al., 2008). Furthermore, curricula taught with fidelity increases the use of condoms and contraceptives among sexually active teens (Kirby 2008, Kirby & Laris, 2009). In addition, sexuality education curricula have been shown to increase student knowledge, increase student self-efficacy about condom use, and create positive attitudes towards abstinence (Roberto et al., 2007).

When taught with fidelity, some sexuality education curricula have been shown to have positive impacts on student behavior (Kirby 2008; Kirby & Laris, 2009; Zimmerman et al., 2008; Roberto et al., 2007). However, research focusing on the factors that affect implementation fidelity of sexuality education curricula in public schools is lacking.

Theoretical Approach

The Theory of Planned Behavior (TPB), with an added self-efficacy construct, will be the theoretical framework used to guide this study. The attitude, subjective norm, and perceived behavioral control constructs within the TPB directly relate to behavioral intention. External variables within TPB include demographic variables, attitudes, personality traits, and individual differences. The construct of self-efficacy from the Integrated Behavioral Model will be added as a determinant of behavioral intention (Glanz et al., 2008). A diagram of the theoretical framework can be found in Appendix A.

External Variables

The external variables included in the TPB are teacher demographics, attitudes, personality traits, and individual differences. The demographics (i.e. subjects) of the study population will be secondary teachers in Central Texas public schools implementing the *Big Decisions* curriculum. Demographic factors of interest include professional development, teaching experience, and teacher versus teacher plus (i.e. those with assigned duties outside of teaching). Professional development includes Bachelor's degree field, minor field, teacher certifications, and specific sexuality education training. The external variable attitude will illustrate a positive, negative, or indifferent perspective about sexuality education.

Determinants of Behavioral Intention

Attitudes are composed of the beliefs concerning the behavior and the individuals' perceptions about the outcomes produced by performing the behavior (Glanz et al., 2008). Research has shown teacher attitudes towards the curriculum are related to the amount of curriculum delivered (Beets et al., 2008). In addition, researchers have identified negative attitudes or skepticism towards possible outcomes as a barrier to curriculum or program delivery (Lohrmann, Forman, Martin, & Palmieri, 2008).

An individual's subjective norm is their perception of what other individuals believe about the behavior, weighted by his or her motivation to comply with those beliefs (Glanz et al., 2008). Researchers have identified teacher subjective norms, specifically coordination, collaboration, and uniformity among teachers as a barrier to implementing programs (Sherman, Tran, & Alves, 2010). In addition, teacher subjective norms regarding school administration and community support (i.e. parents) has been

shown to affect implementation (Kloeppel, Kulinna, Stylianou, & van der Mars, 2013; Beets et al., 2008; Sherman et al., 2010; Bambara, Nonnemacher, Kern, 2009)

Perceived behavior control is a combination of an individual's control beliefs and perceived power. Control beliefs are the factors inhibiting or supporting the performance of the behavior. Perceived power is one's perception of whether he or she can overcome or utilize these control factors (Glanz et al., 2008). Researchers have identified instructional time as a major barrier inhibiting the successful implementation of health programs and curricula (Bambara et al., 2009; Pinkelman, McIntosh, Rasplika, Berg, and Strickland-Cohen, 2015; Wang et al., 2015; Rauscher, Casteel, Bush, & Myers, 2015).

The self-efficacy construct of this study will focus on the teacher's self-efficacy to implement the *Big Decisions* curriculum with fidelity, in particular the lesson on condoms and contraceptives. Self-efficacy is an individual's belief about their ability to perform a behavior (Bandura, 1986). Research has shown teachers with higher self-efficacy are more likely to demonstrate how to use condoms (LaChausse, Clark, & Chapple, 2014). Furthermore, teachers identified as having high levels of self-efficacy deliver curricula with greater fidelity (Justice, Mashburn, Hamre, & Pianta, 2007; Wang et al., 2015; Rauscher et al., 2015).

Research Questions

To understand how intrapersonal, interpersonal, and community factors impact curriculum fidelity of *Big Decisions*, the following research questions will be addressed:

- What is the impact of intrapersonal factors on the fidelity of teaching a sexuality education curriculum?
- What is the impact of interpersonal factors on the fidelity of teaching a sexuality education curriculum?

- What is the impact of community factors on the fidelity of teaching a sexuality education curriculum?

Assumptions

It is assumed teachers in the study will teach as they customarily do during the classroom observations and will not perform extra preparation work due to being observed. It is also assumed teachers will understand all survey questions and respond honestly. In addition, it is assumed district administration will support this study. Given central administration support, it is assumed campus level administration (principals, assistant principals) will also support this study and allow the data collection team to observe teachers in the classroom.

Definitions

Curriculum Fidelity: The degree to which a curriculum is delivered as intended.

Teacher and Teacher Plus: Teacher plus refers to assigned additional responsibilities outside of teaching. Responsibilities include but are not limited to: coaching, being a department head, or an advisor to a school organization.

School Climate: The contextual characteristics of schools including administrative and peer support which influences the fidelity of implementation.

Staff Support: Characterized as meeting regularly, having a broad representation of staff members, and training for staff members.

Evidence-Informed Curriculum: A curriculum that is designed using evidence-based practices.

II: LITERATURE REVIEW

Introduction

Curriculum fidelity has a positive impact on student outcomes including self-efficacy and student behavior (Sieving, Bearinger, Resnick, Pettingell, & Skay, 2007; Zimmerman et al., 2008). When taught with fidelity, some sex education programs have been shown to increase condom and contraceptive use, delay the initiation of intercourse, and reduce the number of sexual partners (Kirby, 2008; Kirby & Laris, 2009).

Curriculum fidelity has also been identified as one of the 17 characteristics of effective sexuality education curricula (Kirby, 2007).

Intrapersonal and interpersonal factors alike influence curriculum fidelity.

Intrapersonal factors include professional development experiences, teacher attitudes regarding subject material, and teacher self-efficacy (LaChausse et al., 2014; Uribe-Florez & Wilkins, 2010). Teacher training has been shown to increase the likelihood of implementing lessons about condom use (LaChausse et al., 2014). In addition, Kirby (2007) identified lessons about condom use as one of the 17 characteristics of effective sex education curricula. Interpersonal factors influencing curriculum fidelity include administrative support and perceived support from fellow teachers (Kloepfel et al., 2013; Sherman et al., 2010).

The Impact of Curriculum Fidelity on Student Outcomes

When taught with fidelity, sex education curricula increase student self-efficacy and student knowledge (Wang et al., 2015; Roberto et al., 2007; LaChausse 2006; Denny & Young, 2006). Specifically, condom use self-efficacy increases when curricula are taught with fidelity (Roberto et al., 2007; LaChausse 2006). Curriculum fidelity in

teaching sex education curricula also has a positive effect on student behavior. Students are more likely to abstain from sex when curricula are taught with fidelity (Zimmerman et al., 2008). In addition, some sex education programs increase condom use and decrease the number of sexual partners among sexuality active individuals (Chin et al., 2012; Coyle et al., 2006; Villarruel, Jemmott III, & Jemmott, 2006).

Impact of curriculum fidelity on student self-efficacy. According to Bandura (1986), self-efficacy is an individual's beliefs about his or her ability to perform a behavior. In a fidelity study of an evidence-based HIV intervention, researchers organized participants into high, moderate, and low implementation groups based on intervention fidelity. Researchers measured student self-efficacy and intention to use protection during sex and found student self-efficacy and intention were higher among students in the in the high or moderate fidelity group compared to students in the low fidelity group (Wang et al., 2015). Using an experimental design, researchers studied the effects of a computer-based pregnancy, STD, and HIV intervention program. A process evaluation of the program showed all materials were implemented with fidelity. Data from the study shows the treatment group had significantly greater condom use self-efficacy when compared to the control group (Roberto et al., 2007). In a longitudinal experimental study of the *Positive Prevention* curriculum, LaChausse (2006) illustrated the self-efficacy of condom use for the intervention group was significant when compared to the control group. Furthermore, the self-efficacy of the intervention group increased significantly from pretest to the one-month posttest and to the six-month follow-up.

The aforementioned studies illustrate the effect of curriculum fidelity on student behavior, specifically to condom use self-efficacy. In a study about self-efficacy and contraceptive use, researchers linked self-efficacy to actual contraceptive use for both males and females (Sieving et al., 2007). Using the Information-Motivation-Behavior Skills Model, Kalichman et al. (2002) found condom use self-efficacy to be linked to actual condom use.

To further illustrate the importance of self-efficacy in teaching sex education, researchers have documented the relationship between resistive efficacy and the number of sexual partners. Resistive efficacy is the confidence an individual has in him or herself to resist external pressure to participate in risky behaviors (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001; Bandura, Caprara, Barbaranelli, Pastorelli, & Regalia 2001). Mitchell, Kaufman, and Beals (2005) provide evidence linking resistive efficacy to fewer sexual partners. In addition, resistive efficacy has been associated with greater sexual esteem (Rostosky, Dekhtyar, Cupp, & Anderman, 2008).

Impact of curriculum fidelity on student behavior. In a randomized control trial of the *Positive Behavioral Interventions and Supports* program, researchers documented the effects of quality implementation (i.e. fidelity). Results were a reduction in both office discipline referrals and student suspensions compared to the control group (Bradshaw, Mitchell, & Leaf, 2010). When fidelity is applied to sex education, researchers noted students were more likely to abstain from sex when the curriculum was taught with fidelity (Zimmerman et al., 2008). In three separate quasi-experimental studies, implementation fidelity had a positive effect on student attitudes toward abstaining from sexual intercourse (LaChausse, 2006; Roberto et al., 2007; Weed,

Ericksen, Lewis, Grant, & Wibberly, 2008). Furthermore, research has demonstrated the effectiveness of some sex education programs to reduce sexual activity, sexual activity with multiple partners, reduce unprotected sex, and increase the use of condoms when taught with fidelity (Chin et al., 2012; Coyle et al., 2006; Villarruel et al., 2006).

Two meta-analyses of the literature illustrate the impact of sex education taught with fidelity on adolescent student behavior. In a review of 48 curriculum-based comprehensive sex education programs, Kirby (2008) found 47% (15 of 32) of curricula delayed the initiation of sex. In addition, 29% (6 of 21) reduced the frequency of sex, 46% (11 of 24) reduced the number of sexual partners, 47% (15 of 32) increased condom use and 44% (4 of 9) increased the use of contraceptives. In a separate review of the literature, Kirby and Laris (2009) found 41% of curriculum-based programs delayed the initiation of intercourse. Moreover, 31% decreased the frequency of sex and 40% reduced the number of sexual partners. In both reviews, exposure to sex education curricula did not increase the frequency of sex among participants (Kirby 2008; Kirby & Laris, 2009). Furthermore, an increase in condom use among participants was seen in 42% of curricula and an increase in the use of contraceptives among participants was seen in 40% of curricula. Of all 55 studies analyzed, 64% had a positive impact on at least one sexual behavior (Kirby & Laris, 2009).

Impact of curriculum fidelity on student knowledge. In addition to having a positive impact on student self-efficacy and student behavior, fidelity increases student knowledge about subject material (Benner, Nelson, Stage, & Ralston, 2011; Roberto et al., 2007; Zimmerman et al., 2008; Wang et al., 2015). When implementing a reading improvement program, researchers found greater gains in reading and comprehension

when the program was taught with fidelity (Benner et al., 2011). Furthermore, researchers found the intervention group of a computer-based pregnancy, STD, and HIV prevention intervention demonstrated significantly greater knowledge when compared to the control group. A process evaluation showed the intervention was implemented with fidelity (Roberto et al., 2007). Moreover, a comparison of means scores illustrated significant knowledge gains by an intervention group when compared to the control group. A process evaluation of the HIV and pregnancy prevention curriculum showed the curriculum was implemented with fidelity (Zimmerman et al., 2008). Denny and Young (2006) found similar results in an evaluation of another sexuality education curriculum. Researchers have also documented student knowledge was greater at posttest when programs were taught with high or moderate fidelity (Wang et al., 2015).

Student self-efficacy, specifically condom use self-efficacy increases when sex education curricula are taught with fidelity (Roberto et al., 2007; LaChausse, 2006). In addition, some sex education curricula taught with fidelity reduce the number of sexual partners, increase rates of abstinence, and increase the use of condoms and contraceptives (Kirby 2008; Kirby & Laris, 2009; Chin et al., 2012; Coyle et al., 2006; Villarruel et al., 2006; Zimmerman et al., 2008). Further, significant knowledge gains can be achieved when sex education curricula are taught with fidelity (Zimmerman et al., 2008; Denny & Young, 2006).

The Impact of Intrapersonal Factors on Curriculum Fidelity

Studies have shown various intrapersonal factors influence curriculum fidelity (LaChausse et al., 2014; Beets et al., 2008; Justice et al., 2008). Additionally, research has demonstrated professional development (i.e. teacher training) results in higher rates

of curriculum fidelity (Bradshaw et al., 2010). Furthermore, research illustrates how teacher attitudes impact curriculum fidelity (Uribe-Florez & Wilkins, 2010). Likewise, teacher self-efficacy has been identified as an important factor in curriculum fidelity (LaChausse et al., 2014).

Influence of professional development on curriculum fidelity. Research has shown professional development has a positive impact on curriculum fidelity (LaChausse et al., 2014; Justice et al., 2008; Wang et al., 2015; Bradshaw et al., 2010). In an experimental study using the *Positive Prevention PLUS Sexual Health Education* curriculum, LaChausse et al. (2014) reported credentialed health education teachers with a two-day training on the program were more likely to implement lessons about condom use.

In a curriculum fidelity study of the *My Teaching Partner-Language and Literacy Curriculum*, researchers observed higher fidelity ratings in teachers who attended more training sessions about language and literacy development (Justice et al., 2008). In a longitudinal randomized control trial, researchers documented training resulted in higher rates of implementation fidelity (Bradshaw et al., 2010). Additionally, Wang et al. (2015) reported not only did teacher training improve curriculum fidelity, but teacher training also increased teacher comfort in implementing a sexuality education curriculum.

Research has shown the positive effects of professional development on curriculum fidelity (LaChausse et al., 2014; Justice et al., 2008; Wang et al., 2015; Bradshaw et al., 2010). Bambara, Nonnemacher, and Kern (2009) illustrated teachers believed training was essential in implementing programs with fidelity. Specifically, 92% of participants described ongoing training as essential to successful program

implementation, while 76% of participants cited the lack of training as a barrier to program implementation (Bambara et al., 2009).

Influence of teacher attitudes on curriculum fidelity. In a randomized trial in 20 public schools, researchers determined how teacher attitudes affected curriculum fidelity of the *Positive Action* program. Results indicated teacher attitudes had a positive effect on curriculum fidelity (Beets et al., 2008). In addition, Uribe-Florez and Wilkins (2010) noted teacher attitudes accounted for a significant amount of variance in teacher instructional practices. In an evidence-based HIV prevention program, Wang et al. (2015) demonstrated teacher attitudes towards the importance of the curriculum were associated with greater implementation fidelity. These results suggest teachers who have positive attitudes about sexuality education were more likely to implement the curriculum with fidelity.

In telephone surveys of high school teachers implementing the evidence-based “*Youth@Work: Talking Safety*” curriculum, researchers identified teacher attitudes as a factor in curriculum fidelity. Fifteen percent of teachers only taught lessons they felt were important and only taught the first few lessons of the curriculum believing those lessons were sufficient for teaching the topic (Rauscher et al., 2015). Personal beliefs, values, and philosophies were reported by 82% of participants as affecting their respective curriculum implementation, thus leading to inconsistent delivery of curricula to students (Andreou, McIntosh, Ross, & Kahn, 2015). In addition, teacher beliefs, particularly skepticism about the program, was noted as barriers to implementation (Lohrmann et al., 2008).

The relationship between teacher self-efficacy and curriculum fidelity. Using an experimental design, researchers identified teacher self-efficacy as a significant predictor of curriculum fidelity, specifically in condom use role-play and condom demonstrations (LaChausse et al., 2014). Both role-play scenarios and condom demonstrations have been identified as characteristics of effective sex education curricula (Kirby, 2007). Moreover, Rauscher et al. (2015) found teacher self-efficacy and teacher enthusiasm toward the curriculum were positively associated with curriculum adoption and curriculum fidelity.

Further research shows high levels of curriculum fidelity with teachers who report a higher sense of self-efficacy (Justice et al., 2008). In a fidelity study of an evidence-based HIV intervention, researchers organized participants into high, moderate, and low implementation groups based on intervention fidelity. Results of the study reveal teacher self-efficacy was higher in the high (66%) and moderate (58%) implementation group compared to the low (22%) implementation group (Wang et al., 2015).

Not only do teachers perceive professional development to be essential to implementing programs and curricula (Bambara et al., 2009), but research has demonstrated professional development improves curriculum fidelity (Bradshaw et al., 2010; Wang et al., 2015; LaChausse et al., 2014; Justice et al., 2008). In addition to professional development, teacher attitudes have an effect on curriculum fidelity (Rauscher et al., 2015; Andreou et al., 2015; Lohrmann et al., 2008). Further, high teacher self-efficacy positively impacts the fidelity of curriculum (Justice et al., 2008; Wang et al., 2015).

The Impact of Interpersonal and Organizational Factors on Curriculum Fidelity

Through qualitative studies researchers have identified the critical role school administration and teacher support play in program implementation (Beets et al., 2008; Kloeppe et al., 2013; Pinkelman et al., 2015; Sherman et al., 2010; Lohrmann et al., 2008). Program support from school administration and teachers creates a school climate which promotes implementation and fidelity. School climate has a positive association with implementation fidelity (Beets et al., 2008). In addition, the time commitments of programs have been identified as a barrier to curriculum fidelity (Bambara et al., 2009; Wang et al., 2015; Pinkelman et al., 2015; Rauscher et al., 2015)

The role of school administration in curriculum fidelity. In a study examining the relationships influencing curriculum fidelity in a school system, researchers concluded school leadership is influential in creating an environment supporting and promoting fidelity (Beets et al., 2008). During classroom observations of the teaching of a physical education curriculum, researchers noted higher rates of curriculum fidelity (i.e. 83.6% of material was taught) in a school district with higher administrative support compared to rates of curriculum fidelity (61.3%) in a school district with lower administrative support. Characteristics of high administrative support included: (a) informing teachers the curriculum was adopted, (b) indicating they required teachers to be trained in the curriculum, (c) provided training on the curriculum at least once a semester, and (d) provided equipment to support the teachers (Kloeppe et al., 2013). Furthermore, supportive school administration has been identified as one of the characteristics of effective curriculum-based sex and STD/HIV education programs. In addition, providing training, monitoring, and supervision has also been identified as a

characteristic of effective curriculum-based sex education programs (Kirby & Laris, 2009).

Pinkelman et al. (2015) found similar results to the research conducted by Kloeppe et al. When qualitatively analyzing open-ended questions from an online survey. Of the 860 participants, 197 mentioned school administrator support was important in program fidelity and sustainability. To understand what factors support program sustainability and fidelity, researchers conducted semi-structured face-to-face interviews. Seventy-six percent of participants indicated school administration had a critical role in program sustainability and fidelity (Andreou et al., 2015).

Barrett, Bradshaw, and Lewis-Palmer (2008) cite the benefits of multiagency collaboration (school, district, region, and state) in program implementation. This multilevel structure can provide training, capacity building, and leadership for implementation of school-based programs. During semi-structured interviews, participants revealed they believed without direction from administration, program implementation would not occur. In addition, participants felt school administration was critical in providing comfort and security during program implementation (Lohrmann et al., 2008). Bambara et al. (2009) provide additional evidence to support the importance of administrative support through interviewing classroom teachers, school administrators, and parents. Eighty four percent of interviewed participants mentioned the fundamental role school principals play in promoting program acceptance and making program implementation possible.

The relationship between school climate and curriculum fidelity. School climate has been associated with the number of lessons delivered (Rauscher et al., 2015).

In a study conducted by Bambara et al. (2015), almost 92% of participants cited the importance of school climate. Participants felt the absence of a supportive school climate made it difficult to implement the *Positive Behavior Support* (PBS) intervention. In addition, 84% of participants mentioned the varying and conflicting beliefs and practices of school personnel make accepting the intervention challenging. Furthermore, Beets et al. (2008) found a positive relationship between a supportive school climate and the amount of curriculum delivered.

The relationship between perceived support and curriculum fidelity. Using semi-structured interviews of classroom teachers, researchers identified the lack of parental support and uniformity among teachers as a barrier to program implementation (Sherman et al., 2010). In another study, participants identified staff-to-staff relationships as an influential part of implementation. Staff resistance to program implementation was a result of feeling excluded from one another and administration (Lohrmann et al., 2008). In a study analyzing the factors influencing sustainability and implementation, 88% of participants cited the importance of staff support in implementation. Staff support is characterized as meeting regularly, having a broad representation of staff members, and training for staff members (Andreou et al., 2015). For programs to be successfully implemented, staff members need to support the program. Qualitative research has shown staff “buy-in” as an enabler to program implementation and a lack of staff buy-in as a barrier to successful program implementation (Pinkelman et al., 2015).

The relationship between classroom time and curriculum fidelity. Numerous researchers have identified classroom time as an important barrier to curriculum fidelity (Bambara et al., 2009; Wang et al., 2015; Pinkelman et al., 2015; Rauscher et al., 2015).

In a qualitative study on the *Positive Behavior Support* intervention, 88% of participants identified time as concern for implementing the intervention. The typical school schedule does not allow school personnel to collaborate together during the school day. Due to their schedules, teachers felt “overburdened” by the extra PBS activities. In addition, 76% of participants noted implementing the PBS intervention would be too time consuming (Bambara et al., 2009). When studying the fidelity of an HIV risk-prevention program, Wang et al. (2015) found teachers who taught the program with moderate or low fidelity felt they had other priorities than teaching the curriculum. These findings suggest teaching or implementing extra activities can overburden teachers and therefore result in poor implementation fidelity.

In a study conducted by Pinkelman et al. (2015), surveyed teachers identified time as a significant barrier in sustaining the program. Researchers also found some teachers only teach what they feel is most important or relevant to their students due to time constraints (Rauscher et al., 2015).

Researchers have revealed the importance of school administration in creating an environment supporting program implementation and fidelity (Beets et al., 2008; Kloepfel et al., 2013; Pinkelman et al., 2015; Bambara et al., 2009). Not only can support from school administration create an environment supporting program implementation and fidelity, but administration can also give teachers the security they need to implement programs successfully (Lohrmann et al., 2008). In addition, the interpersonal relationship between teachers has been documented as an enabler to successful program implementation (Sherman et al., 2010; Andreou et al., 2015). Despite strong support from school administration, the time teachers can devote to certain programs or curricula can

be a barrier to implementation fidelity (Pinkelman et al., 2015; Rauscher et al., 2015; Bambara et al., 2009).

Summary

Curriculum fidelity has been shown to improve student outcomes and student behavior (Bradshaw et al., 2010). When taught with fidelity evidence-based sexuality education curricula delays the initiation of intercourse, reduces the frequency of intercourse, reduces the number of sexual partners, and increase the use of condoms and contraceptives (Kirby, 2008; Kirby & Laris, 2009; Zimmerman et al., 2008; Chin et al., 2012). Moreover, research has shown significant knowledge gains among students when sexuality curricula are taught with fidelity (Zimmerman et al., 2008; Denny & Young, 2006; Roberto et al., 2007). In addition, research has demonstrated some curricula taught with fidelity increase the condom use self-efficacy of students (Roberto et al., 2007; LaChausse, 2006).

Intrapersonal, interpersonal, and organizational factors have been shown to impact curriculum fidelity. Professional development (i.e. teacher training) positively affects curriculum fidelity (Bradshaw et al., 2010; Wang et al., 2015; LaChausse et al., 2014; Justice et al., 2008). In addition, teachers with a high degree of self-efficacy implement curricula with greater fidelity (Justice et al., 2008; Wang et al., 2015). Supportive school administration has been identified as an important part of curriculum fidelity (Kloepfel et al., 2013; Andreou et al., 2015). Furthermore, the interpersonal relationships between teachers can create an environment that promotes curriculum fidelity (Sherman et al., 2010; Lohrmann et al., 2008; Pinkelman et al., 2015). Supportive school administration and a positive school environment however, is not enough to

promote curriculum fidelity. Teachers must have the necessary classroom time to implement curricula with fidelity (Bambara et al., 2009; Wang et al., 2015; Pinkelman et al., 2015; Rauscher et al., 2015).

III: METHODS

IRB Approval

This project was approved by the Texas State IRB on October 16, 2015. The IRB Reference Number is EXP2015D836184O.

Subject Selection

Potential participants were contacted for this study through the Hays CISD. Participants must be teaching the *Big Decisions* curriculum during the study period. Teachers participating in the classroom observations will be selected from volunteers who will allow members of the observation team to observe their classroom teaching. Prior to subject selection, school and district administrators will complete and sign a consent form indicating permission to contact their teachers to participate in the study. Teachers participating in the classroom observations will also complete and sign a consent form.

Central administration officials within Hays CISD are concerned sexuality education, particularly education on contraceptives, is not being covered with fidelity (M. Walker, personal communication, July 29, 2015). Campus administrators were contacted about the study. Once administrative consent is obtained, the primary investigator will recruit teachers to participate in the study. Teachers from Hays CISD who were willing to have members of the data collection team observe their classroom instruction submitted their name to the primary investigator. Additionally, all health education teachers (regardless if they volunteer for the classroom observations) from Hays CISD were be

given the opportunity to complete a survey measuring teacher attitudes, subjective norms, perceived control, and self-efficacy about teaching sexuality education.

Dependent Variables

The dependent variables in this study include attitudes, subjective norms, perceived control, and self-efficacy in teaching sexuality education. In addition, the study will measure fidelity of the *Big Decisions* curriculum. No intervention will be conducted; therefore, there are no independent variables.

Pilot Testing Procedures

A pilot test will be conducted to ensure readability, validity, and reliability of survey questions. The survey will be pilot tested by Health Education graduate students who are in their first or second full semester of graduate school. In addition, recent graduates from the Health Education Master's program and select faculty from the Department of Health and Human Performance with an interest in health pedagogy in a school setting will pilot test the survey. All pilot testers took the survey twice. Pilot testers first took the survey as written, recording the time it takes to complete the survey. Upon taking the survey a second time, pilot testers confirmed the clarity and readability of survey questions.

As part of a *Big Decisions* training, teachers practiced implementing lessons from the curriculum. The data collection team observed teachers during the training sessions to test the readability, validity, and reliability of the curriculum fidelity tool. Furthermore, as a part of the pilot process, one teacher from Hays CISD was recorded implementing a lesson from the *Big Decisions* curriculum in a classroom setting. The primary investigator was also recorded teaching one lesson from the curriculum. Collectively

these recordings, along with teacher observations during the *Big Decisions* training, were used to conduct an inter-rater reliability assessment of the observation team. The inter-rater reliability assessment was calculated using correlation coefficients.

Data Collection Techniques

This study utilized a mixed methods design. A survey instrument was used to collect quantitative data about teacher attitudes, subjective norms, perceived control, and self-efficacy about teaching sexuality education. Qualitative data was gathered during classroom observations via field notes from the curriculum fidelity tool. Together, the quantitative and qualitative data allowed the primary investigator to examine the relationship between teacher attitudes about teaching sexuality education and the lesson fidelity of *Big Decisions*.

Health education teachers from Hays CISD were observed delivering *Big Decisions*. The classroom observations occurred in May of 2016. Each teacher was observed implementing approximately four lessons from the *Big Decisions* curriculum. The lesson to be observed and class period of the observation were randomly selected. However, all teachers participating in the classroom observations were observed implementing the lesson *Contraception: Pregnancy at a Good Time for You*. In addition to randomly selecting the class period of the observation and lesson to be observed, the member of the data collection team to complete the observation was randomly selected. During a classroom observation the observer only entered and left the classroom during passing periods. Hays CISD follows a traditional bell schedule, therefore the classroom observations lasted the entire class period.

The data collection team was composed of the primary investigator Matt Bishop, and fellow graduate students Sheri Burson, Sergio Castaneda, Adam Rosa, and Vanessa Vought. All members of the data collection team are graduate students in Health Education in the Department of Health and Human Performance at Texas State University. The data collection team attended a training on the *Big Decisions* curriculum taught by the developers of the curriculum, “Healthy Futures of Texas.” The data collection team utilized the curriculum fidelity tool during the *Big Decisions* training session. This training session was used as an opportunity to familiarize the data collection team with the curriculum fidelity tool and ensure its readability, reliability, and validity. In addition, the data collection team underwent an inter-rater reliability assessment using the curriculum fidelity tool before the start of data collection. The two previously mentioned recordings were used to conduct the inter-rater reliability assessment along with observations during the *Big Decisions* training. These recordings were also used to train the data collection team on a regular basis before the start of data collection.

Teachers were also asked to complete a 29 question survey. Teachers will be given the survey at the conclusion of the *Big Decisions* training. The paper and pencil survey will utilize a passive consent notifying teachers if they complete the survey their responses will be used as part of a study. Health education teachers not participating in the classroom observations will also be given the opportunity to complete the survey enabling the primary investigator to compare the attitudes, self-efficacy, and perceived control of teachers who did/did not volunteer to allow the data collection team to observe their classroom implementation of *Big Decisions*.

Field notes from the classroom observations and completed surveys will be kept in a secure, locked cabinet at Texas State University. To maintain confidentiality, participants will be assigned a six-digit code. This six-digit code will be recorded on field notes and surveys allowing researchers to compare results from survey data and classroom observations. Data stored electronically will be encrypted and password protected.

Data will be gathered and analyzed as group data and no participants will be identified by name. Data will be analyzed using descriptive statistics and cross tabulations and all data collected from the study will be solely accessible by the primary investigator and his supervisor, Dr. David Wiley. The results of the study will be provided as group data to Hays CISD administrators and all interested health teachers. Results will be shared through traditional professional venues with professionals interested in curriculum fidelity, classroom observation, and sexuality education.

IV: RESULTS

Participants

A total of 13 of 14 (92.8%) surveys were completed by health education teachers in Hays CISD. Of the 13 teachers who completed the survey, 8 were teaching health classes during the semester of the classroom observations. Seven of the eight teachers (87.5%) volunteered to participate in classroom observations however, two teachers eventually declined participation. Each of the five remaining teachers were observed four times for a total of 20 classroom observations.

Quantitative Analyses

Demographic item frequencies (See Table 1) illustrate the majority of health education teachers in Hays CISD do not have an undergraduate degree in health education (76.9%) or an undergraduate minor in health education (84.6%). The majority of teachers had 1-3 years of experience teaching health education (46.2%) or did not have any experience teaching health education (30.8%). Furthermore, the majority of teachers had attended 1-3 professional development trainings on sexuality education in the past year (76.9%) including the two trainings on the *Big Decisions* curriculum. All teachers coached at least one athletic team while three teachers (23.1%) coached between four and six school affiliated athletic teams during the school year.

The Theory of Planned Behavior (TPB), with an added self-efficacy construct, was the theoretical framework used to guide this study (See Appendix A). The attitude, subjective norm, perceived behavioral control, and self-efficacy constructs directly relate to behavioral intention. Demographic characteristics such as professional development, teaching experience, and teacher versus teacher plus (teachers with additional responsibilities outside of teaching), modify the constructs directly relating to behavioral

intention (Glanz et al., 2008). For the purpose of this study professional development included undergraduate degree field, minor field, teacher certifications, and specific sexuality education training. Pearson correlation coefficients were calculated to determine if a relationship existed between the demographic characteristics and teacher attitudes, subjective norms, self-efficacy, and perceived behavioral control in regards to teaching sexuality education (See Table 2).

Correlation coefficient values less than 0.35 are considered small, values between 0.36 and 0.67 are considered moderate, and values over 0.68 are considered strong (Taylor, 1990). This study identified a moderate relationship between undergraduate major and subjective norm ($r = 0.37$) whereas undergraduate minor had a moderate relationship with attitude ($r = 0.50$) and self-efficacy ($r = 0.57$). Teaching certification had a moderate relationship with self-efficacy ($r = 0.37$). The number of professional development trainings had a moderate relationship with perceived behavioral control ($r = 0.47$). The number of athletic teams coached had a weak relationship with attitude ($r = 0.14$), subjective norm ($r = 0.18$), self-efficacy ($r = 0.11$), and perceived behavioral control ($r = .10$).

Table 3 illustrates demographic information for the five teachers who participated in classroom observations. Demographic item frequency counts reveal the majority of teachers observed had undergraduate degrees in physical education (80.0%). Of the five teachers who participated in classroom observations, none had an undergraduate major in health education, two (40.0%) had an undergraduate minor in health education, and four (80.0%) were certified to teach health education, yet did not have undergraduate degrees in the field. All observed teachers coached between one and three school-affiliated

athletic teams. The majority of teachers (80%) had been to at least one professional development training on sexuality education in the past year including the two trainings on the *Big Decisions* curriculum.

Table 4 displays the fidelity scores for each participant. The fidelity score represents a percentage of lesson material that was covered with fidelity (i.e. no fidelity = 0 and perfect fidelity = 100). Individual fidelity scores ranged from zero to 94.2, with the median fidelity score being 53.9. The median fidelity score of each participant ranged from 29.6 to 67.3. During the course of the study, only 7 of the 20 lessons observed were completed during one observation. The median fidelity score of lessons that were completed during one observation was 35.4 and the median fidelity score of lessons that were not completed in one observation (i.e. the class ended before lesson could be completed) was 57.5.

The scales for attitude, subjective norm, self-efficacy, and perceived behavioral control contained Likert-type items with responses ranging from 1 to 7. The attitude variable was the sum of responses to ten items and ranged from 10 to 70. A higher score indicated a more positive attitude towards teaching sexuality education. The subjective norm variable was the sum of responses to five items and ranged from 5 to 35. A higher score represented a greater influence of subjective norms in participants' intention to teach sexuality education. The self-efficacy variable was the sum of responses to four items and ranged from 4 to 28. A higher score represented greater self-efficacy in teaching sexuality education. The perceived behavioral control variable was the sum of responses to two items and ranged from 2 to 14. A higher score indicated a stronger perception of control in regards to teaching the *Big Decisions* curriculum with fidelity.

Table 5 displays participants' median fidelity score along with the variables attitude, subjective norm, self-efficacy, and perceived behavioral control. All participants had positive attitudes about teaching sexuality education and high subjective norm scores indicating a stronger intention to teach sexuality education. All participants, except one, had high self-efficacy scores indicating a high level of confidence in their ability to teach *Big Decisions* with fidelity. The participant with the lowest self-efficacy score (17) also had one of the lowest median fidelity scores (39.3). Perceived behavioral control was used to measure the participants' perception of control in regards to teaching *Big Decisions* with fidelity. The participant with the lowest perceived behavioral control (2) also had the lowest median fidelity score (29.6).

Likert-type items were also used to measure attitudes, subjective norm, and self-efficacy for teaching the lesson on contraception (Lesson 7: *Contraception: Pregnancy at a Good Time For You*) specifically. The attitude variable was the sum of responses to four items and ranged from 4 to 28. A higher score indicated a more positive attitude towards teaching lessons on contraception. The subjective norm variable was the sum of responses to two items and ranged from 2 to 14. A higher score represented a greater influence of subjective norms in participants' intention to teach lessons on contraception. The self-efficacy variable was the sum of responses to two items and ranged from 2 to 14. A higher score represented great self-efficacy in teaching lessons on contraception.

Table 6 displays the fidelity scores for the lessons on contraception with the variables attitude, subjective norm, and self-efficacy. The fidelity scores for the contraception lesson ranged from 34.1 to 57.5 and the median fidelity score was 35.4.

The participant who had the lowest fidelity score (34.1) for the contraceptive lesson also had the highest scores on attitude (28), subjective norm (14), and self-efficacy (14).

Qualitative Analysis

Qualitative data were gathered from field notes and conversations with teachers during the classroom observations. Using the curriculum fidelity tool, each member of the data observation team would transcribe the events occurring during a classroom observation. Field notes included lesson fidelity, the length of time spent on lesson activities, what activities were modified, how activities were modified, the school environment (bell schedule, classroom setting, etc.), and any other events occurring during the observation. It should be noted students were not the focus of this study and therefore student behavior, attentiveness, and questions asked were not observed or recorded.

Contributing factor No. 1: classroom time. Throughout the study teachers expressed concerns regarding the length of lessons in the *Big Decisions* curriculum. Each lesson in the *Big Decisions* curriculum is designed to be taught in 50 minutes however, Hays CISD follows a traditional bell schedule and class periods were rarely 50 minutes long. In addition, teachers often had school announcements and common classroom management responsibilities including checking roll, announcements regarding upcoming exams or other graded items, etc. that reduced actual classroom instruction time. Furthermore, teachers often needed to assign grades to students, therefore often had a quiz or graded activity at the beginning of class, again reducing classroom instruction time. Teachers would review material from the previous lesson and depending on the number of questions from students, this review session would often result in a lengthy

discussion. All of these factors limited available daily classroom instruction time which was already not long enough to teach the *Big Decisions* curriculum as intended.

Teachers also expressed concerns regarding answering student questions. It should be noted all teachers who were observed implementing *Big Decisions* encouraged questions however, some teachers felt the curriculum did not give enough time for a question/answer period. Teachers expressed their concerns based on the lack of time available to teach the curriculum and having to answer numerous student questions related to the material.

Contributing factor No. 2: classroom management. Many activities in the *Big Decisions* curriculum require students to work in groups and interact with the teacher or other groups. This group work however often led to rowdy and less attentive students. Teachers were forced to spend additional time attempting to refocus groups, manage student behavior, and repeat information.

Contributing factor No. 3: school environment. During the course of this study the State of Texas Assessments of Academic Readiness (STAAR) was administered. Testing lasted an entire week during which most teachers stopped teaching the *Big Decisions* curriculum until the following week. Due to STAAR testing, some teachers were also displaced and had to move their class to different classrooms. Some of these alternate classrooms did not have the equipment (i.e. white boards, projectors, etc.) necessary to teach *Big Decisions*.

Observations took place in five different schools throughout the school district. Each school had a different bell schedule and different class period lengths. In addition, schools had multiple bell schedules, with some schools having as many as four different

bell schedules. These different bell schedules meant, depending on the school, each teacher had a different length of time available to teach *Big Decisions*. Furthermore, the length of time each teacher had to teach the curriculum could change throughout the week depending on the bell schedule.

Contributing factor No. 4: modifying activities. It was not uncommon during the course of the observations for teachers to modify activities from the curriculum. Some activities were modified so teachers could record a daily grade, while some teachers created additional activities for the sole purpose of recording grades. The curriculum activities most often modified included role-play activities, activities which required students to work in groups, and activities which required students to interact with other students or the teacher.

Teachers also had to cover material that was not part of the *Big Decisions* curriculum. Some teachers, per their department requirements, had to cover additional material including puberty and menstruation. When this occurred, teachers created their own power point presentations blending material from *Big Decisions* and the additional material that was required to be covered.

Summary

Demographic item frequencies (See Table 1) reveal the majority of health education teachers in the study did not have an undergraduate degree in health education (76.9%). Demographic frequencies of the five teachers who participated in classroom observations show none had an undergraduate major in health education and two (40%) had an undergraduate minor in health education. In addition, four of the five (80%) teachers were certified to teach health education (See Table 3). Pearson correlation

coefficients revealed moderate relationships between undergraduate minor, teacher attitudes ($r = 0.50$) and self-efficacy ($r = 0.57$). In addition, teaching certification had a moderate relationship with self-efficacy ($r = 0.37$) and the number of professional development trainings attended showed a moderate relationship with perceived behavioral control ($r = 0.47$) (See Table 2). The teacher with the highest attitude score (68) also had the highest median fidelity score (67.3) (See Table 5). The teacher with the lowest self-efficacy score (17) also had the second lowest median fidelity score (39.3). The teacher with the lowest self-efficacy score (9) for teaching contraception also had a lower fidelity score during the contraception lesson (35.4) (See Table 6). The teacher with the lowest perceived behavioral control (2) had the lowest median fidelity score (29.6) (See Table 5). In addition to quantitative analysis, qualitative data provides evidence to suggest classroom time, classroom management, the school environment, and the modification of lesson activities influence curriculum fidelity.

TABLE 1. Sample Demographics: All Teachers

Demographics	<i>n</i>	<i>%</i>
<u>Undergraduate Major</u>		
Health Education	2	15.4
Physical Education	9	69.2
Both	1	7.7
Other	1	7.7
<u>Undergraduate Minor</u>		
Health Education	2	15.4
Physical Education	1	7.7
Other	7	53.8
No Undergraduate Minor	3	23.1
<u>Certified to teach in:</u>		
Health Education	9	69.2
Physical Education	4	30.8
<u>Experience teaching health education</u>		
Less than 1 year	4	30.8
1-3 years	6	46.2
4-6 years	1	7.7
7-10 years	1	7.7
11 or more years	1	7.7
<u>Professional Development Trainings in Past 12 Months</u>		
No trainings	3	23.1
1-3 trainings	10	76.9
<u>Number of Athletic Teams Coached During Academic Year</u>		
1-3 teams	10	76.9
4-6 teams	3	23.1

TABLE 2. Pearson Correlation Coefficients for Demographic Characteristics

	Major	Minor	Certification	YT ¹	PD ²	Coaching
Attitude	.26	.50	.01	.51	-.03	.14
Subjective Norm	.37	.29	-.19	.46	.14	.18
Self-Efficacy	.31	.57	.37	.25	-.38	.11
Perceived Behavioral Control	-.28	.24	.05	-.50	.47	.10

1: Experience Teaching Health Education

2: Professional Development Trainings in the Past 12 Months

TABLE 3: Sample Demographics: Teachers Participating in Classroom Observations

Demographics	n	%
<u>Undergraduate Major</u>		
Physical Education	4	80
Other	1	20
<u>Undergraduate Minor</u>		
Health Education	2	40
Other	2	40
No Undergraduate Minor	1	20
<u>Certified to teach in:</u>		
Health Education	4	80
Physical Education	1	20
<u>Experience teaching health education</u>		
1-3 years	3	60
4-6 years	1	20
7-10 years	1	20
<u>Professional Development Trainings in Past 12 Months</u>		
No trainings	1	20
1-3 trainings	4	80
<u>Number of Athletic Teams Coached During Academic Year</u>		
1-3 teams	5	100

TABLE 4: Fidelity Scores

<u>Participant 1</u>		Median Fidelity Score: 53.3
Fidelity Score	Finish Lesson*	
94.2	No	
58.6	Yes	
48.1	Yes	
34.1	Yes	
<u>Participant 2</u>		Median Fidelity Score: 67.3
Fidelity Score	Finish Lesson	
65.4	No	
69.2	No	
54.8	No	
82.9	No	
<u>Participant 3</u>		Median Fidelity Score: 58.6
Fidelity Score	Finish Lesson	
59.8	Yes	
80.8	No	
57.5	No	
53.1	No	
<u>Participant 4</u>		Median Fidelity Score: 39.3
Fidelity Score	Finish Lesson	
73.8	No	
43.3	No	
35.4	Yes	
0	Yes	
<u>Participant 5</u>		Median Fidelity Score: 29.6
Fidelity Score	Finish Lesson	
45.9	No	
34.2	No	
25.0	No	
4.8	Yes	
		Median Fidelity Score of Finished Lessons: 35.4 Median Fidelity Score of Unfinished Lessons: 57.5 Median Fidelity Score of All Lessons: 53.9

*Notes if the entire lesson was finished during one observation.

TABLE: 5: Fidelity Scores and Attitudes, Subjective Norm, Self-Efficacy, and PBC: All Lessons

	Median Fidelity Score	Attitude	Subjective Norm	Self-efficacy	PBC*
Participant 1	53.3	61	35	25	8
Participant 2	67.3	68	35	25	4
Participant 3	58.6	57	29	24	8
Participant 4	39.3	64	34	17	8
Participant 5	29.6	62	35	26	2

*Perceived Behavioral Control

TABLE 6: Fidelity Scores and Attitudes, Subjective Norm, Self-Efficacy, and PBC: Contraception Lesson

	Fidelity Score	Attitude	Subjective Norm	Self-efficacy	PBC*
Observation 1	34.1	28	14	14	8
Observation 2	57.5	27	14	12	4
Observation 3	45.9	24	14	12	2
Observation 4	35.4	22	10	9	8
Observation 5	34.2	24	14	12	2

*Perceived Behavioral Control

V: DISCUSSION

The purpose of this study was to understand what factors influenced curriculum fidelity in the teaching of the sexuality education curriculum *Big Decisions*. A mixed method design was used to explore secondary school teachers' attitudes and beliefs about sexuality education, perceived subjective norm about teaching sexuality education, perceived classroom control, and perceived self-efficacy in teaching sexuality education. Classroom observations were also utilized to evaluate the fidelity of the *Big Decisions* curriculum and observe factors that might influence fidelity in the classroom.

Previous research has identified professional development, teacher attitudes, teacher self-efficacy, and school administration as important factors in curriculum fidelity (LaChausse et al., 2014; Uribe-Florez & Wilkins, 2010; Kloeppe et al., 2013; Sherman et al., 2010). In addition to impacting curriculum fidelity, professional development is also an effective means in improving teacher self-efficacy, attitudes, and knowledge (LaChausse et al., 2014; Lumpe, Czerniak, Haney, & Beltyukova 2012; Hammig, Ogletree, & Wycoff-Horn, 2011; Duffield, Wageman, & Hodge, 2013).

In the present study, the majority of teachers did not have an undergraduate major or minor in health education. While nearly 70% of the participants were certified to teach health, it does pose the question, are they *qualified* to teach health education? There are no established standards for health education teacher preparation programs in colleges and universities in Texas. As a result, there is no guarantee that even if a teacher is certified in health education, that he/she actually completed a course in human sexuality education. Concomitantly, the majority of the teachers in this study had majors in physical education and there are no requirements that physical education teachers

complete any health education courses as a part of teacher preparation. In addition, the Texas Education Agency (2016) allows anyone who has passed an Educator Preparation Program (EPP) to sit for any content area test, including health education (2016). This requirement can result in teachers technically being *certified* in health education, but in practice, may have *never taken an actual course* in health education or sexuality education as a part of teacher preparation. Having teachers who are technically certified, does not necessarily mean they are the most *qualified* to teach the subject.

Due to the small sample size in this study, there was no significant relationship between professional development and curriculum fidelity. However, professional development did show a moderate relationship between teacher attitudes, teacher self-efficacy, and perceived behavioral control. Specifically, teachers' undergraduate minor had a moderate relationship with attitudes towards teaching sexuality education ($r = 0.50$) and self-efficacy towards teaching sexuality education ($r = 0.57$). In addition, teacher certification had a moderate relationship with self-efficacy towards teaching sexuality education ($r = 0.37$) and the number of professional development trainings indicated a moderate relationship with perceived behavioral control ($r = 0.47$). Data from this study did not indicate a statistically significant relationship between professional development and fidelity. Pearson correlation coefficients however, did show a moderate relationship between undergraduate minor, a characteristic of professional development, and factors that do influence curriculum fidelity including attitudes ($r = 0.50$) and self-efficacy ($r = 0.57$).

Previous research has indicated teacher attitudes have a positive effect on curriculum fidelity (Beets et al., 2008; Wang et al., 2015). In the current study, the

teacher with the highest attitude score (68) also had the highest median fidelity score (67.3). During observations of the contraception lesson, the teacher with the highest fidelity score for that lesson (57.5) also had a high attitude score (27). It should be noted however, teacher beliefs about sexuality education and contraception are not the only attitudes that can influence curriculum fidelity. Lohrmann et al. (2008) noted teacher attitudes, including skepticism about the program, can be a barrier to implementation. In addition, Kirby's research about the Characteristics of Effective Curriculum-Based Sex and STD/HIV Education Programs identifies having motivated teachers who believe in the program as a key element of success (Kirby, 2001).

Results from this study also indicate a relationship between teacher self-efficacy and curriculum fidelity. Teacher self-efficacy consists of (1) the belief in his or her ability to be an effective teacher and (2) the belief that effective teaching leads to student learning (LaChausse et al., 2014; Swars, & Dooley, 2010). In the current study, teachers who had lower self-efficacy scores also had lower median fidelity scores. The teacher with the lowest self-efficacy score (17) also had the second lowest median fidelity score (39.3). LaChausse et al. (2014) identified self-efficacy as a predictor of curriculum fidelity, which is consistent with the findings in the current study. Based on the observations, the limited classroom time could have impacted teacher's self-efficacy when teaching *Big Decisions*. Teachers also had to cover material which was not in the curriculum, but was required by their department and/or school district. Furthermore, some teachers expressed they were more comfortable teaching different curricula, despite having attended two trainings on *Big Decisions*. Additionally, some teachers were unaware *Big Decisions* was an evidence-informed curriculum and were also unaware of

the characteristics and benefits of evidence-informed curricula. Based on not having enough classroom time to implement the curriculum and the curriculum itself not having all the material teachers needed to cover, teachers may have felt *Big Decisions* was not suitable to meet expected student outcomes. Teachers may have also been skeptical about the program due to their lack of awareness regarding evidence-based practices and their comfort with the *Big Decisions* curriculum or sexuality education in general. As previously cited, skepticism about the curriculum can be a barrier to implementation (Lohrmann et al., 2008).

Results indicate a relationship between perceived behavioral control and curriculum fidelity. The teacher with the lowest median fidelity score (29.6), and the second lowest fidelity score during the contraception lesson (34.2), had the lowest score of perceived behavioral control (2). This same teacher also had high attitude (62), subjective norm (35), and self-efficacy (26) scores, therefore suggesting the low fidelity score is a result of the teacher's perceived lack of control in teaching *Big Decisions*. Most teachers expressed they did not have enough time to implement the curriculum. Again, not only did teachers not have enough time to implement the curriculum with fidelity, but they also had to cover additional material which was not provided in the curriculum. Kirby (2001) identified having enough time to implement a curriculum as one of the characteristics of effective sexuality and HIV education programs.

Despite having attended two trainings on how to implement the *Big Decisions* curriculum, teachers in this study still used their own handouts for student note taking and assignments, created their own power point presentations, modified lesson activities, and failed to cover some activities entirely. The activities that were skipped entirely

tended to be interactive, group-based, and/or role playing activities. In the *Big Decisions* curriculum, the interactive activities allow teachers the opportunity to address social pressures influencing sexual activity and give students practice on communication, negotiation, and refusal skills. Moreover, the interactive and role playing activities allow students to personalize information. Addressing social pressures influencing sexual activity, practicing communication, negotiation, and refusal skills, and personalizing the information for students have all been identified as characteristics of effective sexuality and HIV education curricula (Kirby, 2001; Kirby & Laris, 2009), yet teachers in this study routinely eliminated the activities that research shows best impacts student behavior.

When these activities were implemented however, it appeared teachers spent more time managing students than teaching. When teachers used their own handouts or modified lesson activities, it was mostly during these group-based, and/or role playing activities. Not only does the modification of activities undermine curriculum fidelity, but some of the modifications including displaying pictures of diseased genitalia and other fear-based appeals are ineffective at eliciting changes in attitudes or behaviors (Marchand & Filiatrault, 2002). In addition, use of these strategies could be seen as a violation of Articles III and IV of the Code of Ethics for the Health Education Profession. The modification of activities and diseased genitalia pictures violate Article III: Section 2 which states health educators apply current evidence-based standards. Using pictures of diseased genitalia can also be considered a fear-based approach which violates Article IV: Section 5. Under Article IV: Section 5, health educators are responsible for

promoting healthy lifestyles through informed choice, not intimidation or coercion (Coalition of National Health Education Organization, 2016).

The modification of activities during the classroom observations may have been an attempt to cover lesson material in a more time-efficient manner and cover the additional material not present in the curriculum however, is a clear threat to curricular fidelity. Research from Wang et al. (2015) suggests implementing extra activities can overburden teachers, resulting in lower implementation fidelity. In addition, Wang et al. (2015) also identified teachers who taught with lower fidelity felt they had other priorities than teaching the curriculum. If teachers in this study felt overburdened by implementing additional activities, time restrictions, and classroom management responsibilities, it could potentially explain some of the low curriculum fidelity scores. The current study however, did not directly measure if teachers felt overburdened by the curriculum. Future studies into curriculum fidelity of *Big Decisions*, and other sexuality education curricula, should consider measuring how the curriculum affects teacher competing priorities in the classroom.

As previously cited, Kirby and Laris (2009) identified 17 effective characteristics of effective sexuality and HIV education programs including curricula that focus on clear health goals, target specific behaviors, identify psychosocial risk factors, creating a safe environment for learning, personalizing information for students, practicing communication skills, administrative support, and teacher training. *Big Decisions* is an evidence-informed curriculum and was developed using multiple characteristics of effective sexuality and HIV education programs. For example, the curriculum focuses on clear health goals, specific behaviors which lead to these health goals, and the curriculum

also address multiple psychosocial risk and protective factors affecting sexual behavior. The *Big Decisions* curriculum is also designed to create a safe environment for students to participate in sexuality education. Moreover, the activities in the curriculum help students personalize the information, and practice communication, negotiation, and refusal skills. In addition, the school district participating in this study provided teacher training and supported the implementation of the *Big Decisions* curriculum.

Despite the presence of several characteristics of effective sexuality and HIV education programs, the curriculum fidelity of *Big Decisions* was still weak with a median fidelity score of (53.9). Although the school district provided two days of training, the training sessions were in two separate semesters and most teachers left the second training day early due to their coaching responsibilities. This means offering and requiring training, doesn't necessarily mean all teachers will *complete* the training. Of greater concern however, is that the activities in the curriculum which allowed students to personalize information and practice communication skills were often skipped or modified in spite of aligning with the characteristics of effective curriculum-based sexuality education programs. Hays CISD provided ample training opportunities for teachers however, teachers still used their own handouts, power points, and pictures of diseased genitalia during the observations indicating teachers use materials and teaching methodology they are comfortable with thereby limiting curriculum fidelity. Curriculum fidelity is identified as one of the 17 characteristics of effective curriculum based sexuality education programs (Kirby & Laris, 2006). Although the content, activities, and teaching methodologies of *Big Decisions* align with the characteristics of effective curriculum-based sexuality education programs, the weak implementation fidelity of

teachers despite strong administrative support, weakens the potential impact of the curriculum to reduce student sexual risk-taking.

Limitations

These findings may not be generalizable to all health teachers in public schools or all teachers implementing *Big Decisions* due to the small sample size. Similarly, results may not be representative of all health teachers' attitudes, self-efficacy, and perceptions of control considering all teachers were from one central Texas school district. In addition, this school district followed a traditional bell schedule; therefore, the results may not be generalizable to school districts following a "block" bell schedule. Future studies into the factors that affect curriculum fidelity of *Big Decisions* in public schools should focus on recruiting more teachers from a variety of school districts. While this study initially recruited additional school districts for participation, they were unable to adopt the most recent revision of the *Big Decisions* curriculum by the beginning of the study and subsequently had to be removed from consideration as subjects. While school districts were being recruited for this study, the *Big Decisions* curriculum underwent three revisions. In one scenario, the curriculum was updated and revised less than one week after a school district, which had agreed to participate in the study, was trained to implement the curriculum. While the majority of factual content remained the same between revisions, the lesson activities and how factual content was delivered changed between revisions of the curriculum. Future studies should consider observing multiple curricula in addition to *Big Decisions* and if feasible, multiple revisions of the curriculum. It may be more beneficial however, if curriculum developers offering free curricula only have one revision of the curriculum available to the public. In addition,

curriculum developers should keep records of who receives training and should provide notifications when a new revision is available.

Furthermore, one school district which was listed on the *Big Decisions* webpage as being trained in the curriculum had not implemented the curriculum (or any other sexuality education curricula) since 2013. It should be noted teachers, not school districts, are trained to implement curricula. Therefore, when one teacher leaves a school district, new teachers need to and should be trained in order for curriculum implementation to continue. During the course of this study the developers of the *Big Decisions* curriculum were in the process of updating their records on who had been trained on the curriculum (B. Evans, personal communication, July 8, 2016).

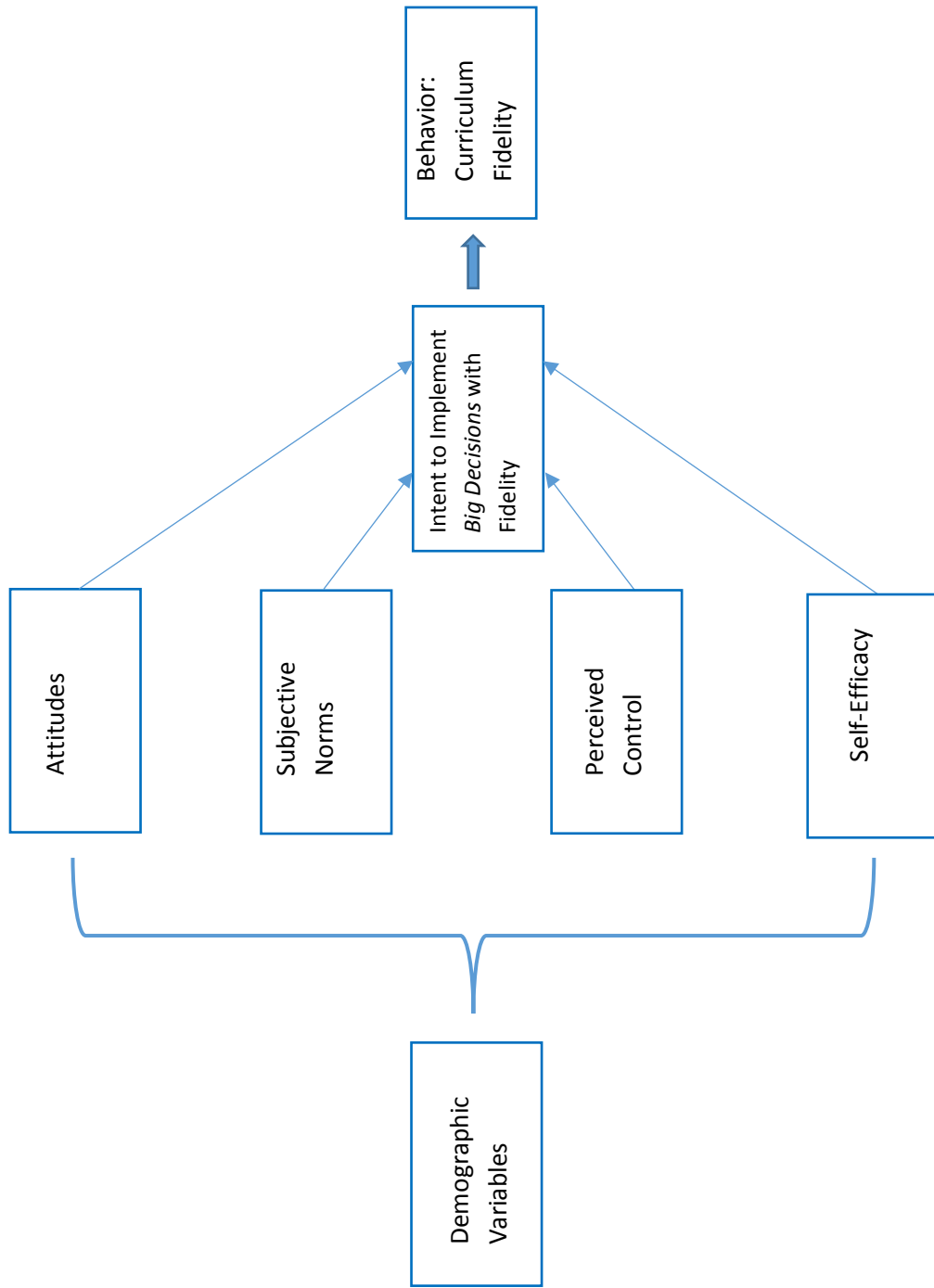
Finally, it is important to acknowledge this study did not explore curriculum fidelity, attitudes, or self-efficacy prior to the *Big Decisions* training. Future research should examine curriculum fidelity, teacher attitudes, and teacher self-efficacy before and after *Big Decisions* training sessions. This study format would allow researchers to understand the effect of the *Big Decisions* training sessions on curriculum fidelity, teacher attitudes, and teacher self-efficacy.

Conclusions

This study was designed to determine the factors influencing curriculum fidelity of the *Big Decisions* curriculum in public schools. These findings contribute to the limited knowledge base about curriculum fidelity among teachers teaching sexuality education curricula in public schools. This study also qualitatively explores what occurs in the classroom and how the classroom environment may influence curriculum fidelity.

The results from the survey portion of this study outline specific demographic information regarding the health education teachers in this central Texas public school. This study also compares demographic information, teacher attitudes, self-efficacy, subjective norms, and perceived behavioral control to the fidelity of the *Big Decisions* curriculum. School districts that follow a traditional bell schedule can utilize this information planning sexuality education instruction. School districts that follow a non-traditional (i.e. block) bell schedule can also utilize this information, however the specific issues with classroom time identified in this study may not be relevant given that more time is usually allotted for instructional periods. Data from studies like this should be shared with curriculum developers to ensure “usable” curricula are developed for this specialized topic.

APPENDIX A



Note: Adopted From Health behavior and health education: theory, research, and practice, p. 70, by Glanz, K, Rimer, B.K., & Viswanath, K., 2008, San Francisco: Jossey-Bass.

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