ANALYZING THE FEASIBILITY OF A GAME-BASED LEARNING PROGRAM TO PREVENT TEEN PREGNANCY: A CASE STUDY

A Dissertation

by

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ABSTRACT

While teen birth rates are at an all-time low for the United States, teen pregnancy remains a public health concern as significant disparities remain among demographic groups and geographical regions. There are 40+ evidence-based programs (EBPs) available, yet few exist for rural populations. Through a community-academic partnership, a community-based organization (CBO) in a rural town of North Carolina developed an innovative teen pregnancy prevention, game-based learning program for youth, *Using The Connect (UTC)*.

The purpose of this dissertation was to analyze the feasibility of *UTC* in a CBO. The researcher focused on three aspects of feasibility – acceptability, implementation, and practicality. Michael's Angels Girls Club, Inc. (MAGC) implemented *UTC* with middle-school aged youth three times in Spring 2019, during which the researcher collected four sources of data from youth and facilitators. Observations documented facilitation of, and participation in *UTC*. Youth surveys assessed experiences, likes and dislikes, perceived learning, and interest in participating in *UTC* again. Facilitated discussions allowed youth to vocalize their experiences and opinions about *UTC*. Through interviews, facilitators described their experiences and perceptions of delivering *UTC*.

For each aspect of feasibility (acceptability, implementation, and practicality) the research team analyzed varying combinations of data. Acceptability revealed youth insight on *UTC* and what made it acceptable to them. Implementation identified factors affecting the implementation process. Practicality gauged expediency of implementing *UTC* to affect sexual health knowledge and skills.

Results from the three studies provide insight on *UTC* feasibility for the developers to make modifications and researchers to formally evaluate the effectiveness and implementation of *UTC*. The results suggest: 1) regarding acceptability, youth liked *UTC* because it felt like playing actual games while learning about sexual health; 2) implementation of *UTC* required minimal organizational capacity aside from time, space, and facilitators; and 3) *UTC* is a practical option for CBOs to equip youth with sexual health knowledge and skills. Through this dissertation, the researcher concluded *UTC* is a feasible option, particularly for rural CBOs as it is fun and engaging for youth, easy for organizations to implement with minimal burdens and a flexible structure that can be tailored to the community.

DEDICATION

This dissertation is dedicated to the youth and staff at Michael's Angels Girls Club, Inc. (MAGC) in Tarboro, NC, and the *Using The Connect* (*UTC*) design team members: Mary Bridges, Christine Exum-Smith, Byron Hall, Shanell Knight, and Yvonne Murphy. I hope this study shows how important your work is and the difference each of you has made, not just for the Tarboro community, but for other communities around the country that will soon benefit from *UTC*. From the moment I walked down Main Street in Tarboro, NC in September 2018, I knew there was something special about the Tarboro community. I quickly learned what drew me in was the energy, passion, and kindness within its people. May you never lose sight of those traits, never stop fighting the good fight, and never settle for less than you are, and your community is, worth. Your work and efforts matter.

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NOMENCLATURE

ACEs	Adverse childhood experiences
CBO	Community-based organization
CFIR	Consolidated Framework for Implementation Research
EBP	Evidence-based program
GBL	Game-based learning
HCD	Human-centered design
iTP_3	Innovative Teen Pregnancy Prevention Programs
MAGC	Michael's Angels Girls Club, Inc.
RE-AIM	Reach, Effectiveness, Adoption, Implementation, and Maintenance
ROI	Rural Opportunity Institute
TIDIeR	Template for Intervention Description and Replication
TPP	Teen pregnancy prevention
UTC	Using The Connect

TABLE OF CONTENTS

Page

LIST OF FIGURES

Page

LIST OF TABLES

Page

1. INTRODUCTION

While teen birth rates are at an all-time low for the United States as a country (Guttmacher Institute, 2016), teen pregnancy remains a public health concern as significant disparities remain among demographic groups and geographical regions (Centers for Disease Control and Prevention (CDC), 2019; Martin et al., 2018; Hamilton et al., 2017, 2016; Sedlak & Bruce, 2010). There are various evidence-based programs (EBPs) available for communities to implement, yet few exist for rural populations (US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2017a, 2017b; Wilson et al., 2017). Through a community-academic partnership, a community-based organization (CBO) in a rural town of North Carolina developed an innovative teen pregnancy prevention program for youth called *Using The Connect*. This dissertation study focused on feasibility testing of *Using The Connect* in a community-based setting, specifically assessing the acceptability, implementation, and practicality of delivering *UTC* to middle school aged youth in a rural CBO setting.

1.1. The Current State of Teen Pregnancy Prevention Programs

For approximately two decades there has been increasing focus on evidence-based programs (EBPs) for teen pregnancy prevention (TPP) (Kappeler & Farb, 2014; Kirby, 2007; Maness & Buhi, 2013; US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2017b). In 2007, the first list of EBPs was released and identified 15 programs shown to delay sexual debut, increase contraception use, and decrease teen births (Kirby, 2007). Three years later, in 2010, governmental entities established funding opportunities to support implementation of existing EBPs, rigorous evaluation of newly

developed programs, and the development of new programs (Kappeler & Farb, 2014; US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2017a). As of 2017, the Office of Population Affairs recognizes and supports over 40 EBPs (US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2017b).

Educational programs are instrumental to sexual health, healthy relationships, and preventing teen and unintended pregnancy. Sexuality education and TPP programs, specifically EBPs, provide information and skill-building opportunities to help young people: 1) reduce sexual health risk behaviors and avoid negative health consequences; 2) communicate about sex and sexual health; 3) understand and develop healthy, rather than unhealthy, relationships; 4) understand sexual and reproductive rights to be autonomous over their bodies, and understand and respect the rights of others' bodily autonomy; and 5) demonstrate dignity and respect for others that may differ in sexual orientation or identity (Bridges & Hauser, 2014).

1.1.1. Existing Evidence-Based Programs

Today's EBPs focus on reducing sexual risk behaviors including sexual initiation and abstinence, number of sexual partners, frequency of sexual activity, contraception use, pregnancy, and sexually transmitted infections (US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2017b). With a list of 40+ programs, one might expect a large variety in intervention setting, level of intervention, and methods and approaches; though that is not necessarily the case. Limitations among EBPs also exist for target populations.

1.1.1.1. Intervention Settings

Many programs were designed to be implemented in specific settings and offer a variety of program sessions, duration, resources, and activities. As expected, most programs are intended for community-based settings (n=26) and schools (n=20); while about one quarter are designed for after school programs (n=13) and clinics (n=12) (US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2017b). There are also programs designed for home settings (n=2) or specialized settings (n=6) (US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2017b). It is important to note programs are not mutually exclusive to a single implementation setting as many of them can be used in more than one setting with certain adaptations (US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2017b).

1.1.1.1.1. Schools

The variety of intervention settings corresponds to ideal places and times to reach youth through education, skill development, and services. Schools are often an ideal setting to reach the largest number of youth as the majority of youth attend schools; specifically 50.6 million students attended public schools in 2016, 3 million students attended public charter schools in 2016 (6% of all public school youth), and 5.8 million youth attended private schools in 2015 (10.2% of all K-12 students) (McFarland et al., 2019). Schools are an educational setting, making an easy fit for programs using a traditional curriculum format; though many teachers are not adequately prepared to teach sexual health (Arrington et al., 2018; Barr et al., 2014).

1.1.1.1.2. Community-Based Organizations (CBOs)

With schools placing restrictions on sexual health content permitted in classes, CBOs are another popular option as they do not have such restrictions. Depending on the mission of the CBO, there are limited restrictions on what content can be delivered. Furthermore, CBOs staffed with competent professionals and associated resources may be better fit for supplementing sexual health information learned in schools, controversial sexual health topics, and referrals to services (Fisher et al., 2012).

1.1.1.1.3. After-School Programs

Compared to schoolteachers, after-school program facilitators can often dedicate more time to EBP lessons and sessions because their time and efforts are not mandated to getting through a specific amount of core instructional content each day to prepare students for state exams. In communities with fewer options for after-school care and activities, after-school programs provide something for the youth to do (Hill et al., 2016). They also often provide an opportunity for youth to receive mentoring and develop meaningful connections with instructors (Bulanda & McCrea, 2013).

1.1.1.1.4. Clinics

Clinics provide a natural setting to discuss and educate people about sexual health. They set the tone for talking about health and wellness, making it a smooth and sometimes more comfortable transition to talking about sexual health. As expected, most clinic-based programs comprise one-on-one sessions between youth and the provider, potentially accompanied with group sessions (Manlove et al., 2015). Such programs are expected to have a lower reach given restrictions around access to healthcare and healthcare providers.

1.1.1.1.5. Rural Communities

To date, only one EBP exists for rural communities. This is concerning as teen birth rates remain highest in rural communities (Hamilton et al., 2016, 2017; Martin et al., 2018; Zaban et al., 2018). The one EBP for rural communities is further constrained in implementation efforts as it is only intended for school settings (US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2017b). When implementing a program, organizational fit and external factors must be considered in advance; both for the one EBP designed for rural communities and potentially using another EBP with acceptable adaptations. It cannot be assumed programs deemed effective in urban communities will be effective in rural communities (Phillips & McLeroy, 2004). If a program does not adequately align with the place, it is not likely to be effective, and can have potentially unanticipated negative repercussions (Demby et al., 2014; Phillips & McLeroy, 2004). Ultimately, rural communities are left with miniscule options in the realm of TPP.

Rural communities differ from urban and suburban communities in many ways, creating a different context and culture. Studies show rural communities experience lower economic conditions (Fowler, 2012; Provasnik et al., 2007); lower availability of health care and social services (Fowler, 2012; Lichter & Crowley, 2002); unreliable transportation (Fowler, 2012); and fewer educational supports and resources (Fowler, 2012; Nadel & Sagawa, 2002; Provasnik et al., 2007). Such factors affect education and programming needs, perceived relevance or fit of a program, along with factors and resources necessary to implement and participate in programs.

1.1.1.2. Program Components: Content, Methods, and Approaches

Across the 40+ EBPs similarities and variations in content, teaching methods, and activities exist. Approximately half of the programs (n=19) are considered sexual health

programs, primarily focusing content around reproductive health (Manlove et al., 2015; US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2017b). Seven programs are specifically youth development programs, which don't focus solely or primarily on sexual health; rather, these programs focus on academic success, leadership, prosocial behaviors and relationships, and/or health outcomes (Children's Hospital Los Angeles, 2020; Positive Teen Health, 2015; Social Development Research Group, 2017; ETR, 2020a; Manlove et al., 2015; ETR, 2020b; Wyman National Network, 2017). Other programs contain content specifically for pregnant and/or parenting teens, youth with a history of sexually transmitted diseases (STDs), youth with substance dependencies, youth in alternative schools, incarcerated youth, and runaway youth (US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2017b). With different needs among the aforementioned groups, each program varies in content, structure, and activities.

Though variation in program content, there are consistencies across programs in methods and activities for educating and impacting youth. Regarding methods and activities, over half utilize technology of some sort, fifteen engage parents/caregivers, and five utilize service learning projects (US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2017b).

1.1.1.2.1. Parent Engagement Activities

Engaging parents/guardians in sexual health education is widely supported for various reasons. Studies indicate youth talk, and want to talk to parents/guardians about sexual health topics when they have questions (Donaldson et al., 2013; Grossman et al., 2018; Lindberg & Maddow-Zimet, 2012). Two meta-analysis studies concluded parent-child communication was a

protective factor, albeit sometimes small, for safer sexual behaviors among sexually active youth (Manlove et al., 2015; Wasik et al., 2014; Widman et al., 2016). However, research denotes parents do not always know how to start the conversations, youth and/or parents may not feel comfortable talking about sexuality-related information, and/or parents do not know the correct information (Eisenberg et al., 2004; Friedman & Morgan, 2009; Grossman et al., 2018; Kantor & Levitz, 2017; Lindberg & Maddow-Zimet, 2012). Therefore, while the parent engagement piece is important to sexuality education, it does not fill the gap of comprehensive sexuality education programs for youth as a stand-alone initiative (Lindberg et al., 2016).

1.1.1.2.2. Service Learning Projects

Service-learning projects, which incorporate a voluntary (or unpaid) community-service type project, have been used for decades to affect adolescents' motivation (Allen et al., 1997; Allen et al., 1994; Denner et al., 2005; Kirby, 2002; O'Donnell et al., 1999, 2002). This is important as motivated participants actively engage in the educational and learning process, put forth effort to succeed, and are likely to develop and master content and skills (Stipek, 1996). Though research confirmed the combined impact of a sexuality education curriculum coupled with the service-learning project was more effective than a curriculum alone in reducing sexual activity among adolescents (O'Donnell et al., 1999, 2002), specific reasons for this difference are only conjecture. Researchers speculate such service provides an opportunity to develop meaningful relationships with facilitators, mentors, and/or peers; a chance to make a difference in someone else's life; encouragement to think about their future; and potentially a way to fill their time to reduce opportunities for engaging in risk behaviors (Denner et al., 2005; Johnson et al., 2017; Kirby, 2002; O'Donnell et al., 1999). Regardless of the reason, research shows programs incorporating service learning projects are often effective (Fish et al., 2014). Though

often effective, such programs are longer in duration, which may be a hindrance to implementation (Kirby, 2002; US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2017b).

1.1.1.2.3. Condom Demonstrations

Another common activity incorporated into programs addressing sexual risk behaviors, whether through sexuality education or youth development, or for youth in varying contexts or settings, is condom demonstrations. Of the 40+ EBPs, 25 programs incorporate condom demonstration activities (US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2017b). According to the National Sexuality Education Standards (NSES), youth should be able to "describe the steps to use a condom correctly" by the end of 8th grade (Future of Sex Eduction Initiative, 2012). This means the remaining 16 EBPs (over one third) do not teach youth proper condom application. Given the resulting restrictions of policies and laws regarding access to health care, youth participants of those 16 programs miss out on learning about how to correctly use a highly effective method of contraception that does not require a health insurance or a health care provider.

In recent years program developers have evolved their approaches to incorporate aspects beyond just sexual health knowledge, to include goal setting, technology, cultural relevance, and positive youth development techniques to target various risk behaviors through skill development (Abe, Barker, Chan, & Eucogco, 2016; Barbee, Cunningham, van Zyl, Antle, & Langley, 2016; Downs et al., 2004; Garney et al., 2019; Jenner et al., 2016; Markham et al., 2012; Piotrowski & Hedeker, 2016). While EBPs impact adolescents' knowledge, skills, and attitudes, many existing programs fail to address dynamic contextual and environmental factors beyond those previously listed including, but not limited to: relationships with partners, social

norms, and availability and access to contraception (Douglas & Fenton, 2013; Goesling et al., 2014; Wilson et al., 2017).

1.1.1.3. Individual Theoretical Level of Change

Moving beyond intervention settings and activities for sexual health programs, the ecological level in which a program targets change is important to note (McLeroy et al., 1988). All existing EBPs target change at the individual level, less than half target change at the interpersonal level, and about 5% are for organizational use (Garney et al., 2018; Goesling et al., 2014). More specifically, those targeting individual level change focus on addressing the aforementioned sexual risk behaviors such as sexual activity and contraception use (US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2017b). Programs focused on or incorporated interpersonal factors addressed youth-parent/guardian relationships, utilized peer mentors, or target sexual partners (Garney et al., 2018). The remaining programs for organizational use do not target organizational change; rather, they are clinic-based programs designed to be implemented by providers within the organization (Garney et al., 2018).

While research supports educating people about sexual health, including but not limited to their bodies, healthy relationships, personal safety, contraceptive options, and the consequences of sex (Chin et al., 2012; Donaldson et al., 2013; Lindberg & Maddow-Zimet, 2012; Santelli et al., 2006), educating individuals is not enough alone (McLeroy et al., 1988; Trickett et al., 2011). To create lasting change, programs must incorporate factors beyond individuals and interpersonal encounters and target change at the organizational, community, and policy levels (Garney et al., 2018; McLeroy et al., 1988; Trickett et al., 2011).

1.1.2. Expanding EBPs

Given the current state of TPP programs, program developers are encouraged to move beyond individual-level approaches to incorporate, if not target change at, ecological levels of influence such as interpersonal, organizational, community, policy, and systems (Garney et al., 2018, 2019; Wilson et al., 2017). The impact of relational influences and ecological behavioral influences is not a new focus as researchers have been calling for professionals to consider, examine, and even address external factors that impact peoples' behavior whether directly or indirectly (Bronfenbrenner, 1979; McLeroy et al., 1988). Researchers advise the field to target social determinants of health, socioeconomic, and other ecological factors to create long-term change, such as structural change and increased [access to] services (Brindis, 2017; Marmot & Wilkinson, 2005; Redman et al., 2011; Trickett et al., 2011). This recommendation for health promotion as a larger field, has trickled down into the field of TPP 7/8/20 1:55:00 PM.

1.2. Innovation in Teen Pregnancy Prevention

Though there are 40+ EBPs, programs deemed effective in one community may not be effective in a contextually similar community (Farb & Margolis, 2016; Phillips & McLeroy, 2004). As society continues to evolve, health education efforts must keep up in evolving strategies and programs to meet the needs of their respective target populations to stay relevant and effective. Innovation in TPP offers opportunities to meet community and societal needs through avenues such as new target populations, new settings, new ideologies, new approaches and modalities, and paradigm shifts (Garney et al., 2019; Wilson et al., 2017).

1.2.1. Addressing Needs of Under-served Populations

Teen birth rates have hit an all-time low for the United States as a country (Guttmacher Institute, 2016), yet disparities remain as demographic groups and geographic regions have teen

birth rates that far exceed the national rate (Centers for Disease Control and Prevention (CDC), 2019; Martin et al., 2018; Hamilton et al., 2017, 2016; Sedlak & Bruce, 2010). Specifically, rural communities experience higher rates of teen pregnancy and birth, with limited options for EBPs (Hamilton et al., 2017; Wuerch et al., 2019; Zaban et al., 2018). Such disparities are not surprising as many programs target larger populations to produce a larger impact. Disparities among teen birth rates and EBPs presents a need for new programs, developed specifically for under-served populations such as rural communities, and/or programs and interventions which move beyond just the individual to target changing external factors that influence behavior, as targeting knowledge and attitudes is ultimately not enough for behavior change (Farb & Margolis, 2016).

1.2.2. Developing New Programs

Developing a program is a timely process. While it takes time to develop meaningful programs, developers should be conscious of their momentum and progress to complete the program before too much time has passed, causing the program to be outdated. Program development is, or should be, an iterative process that continuously incorporates user feedback, allows for failure and accepts when ideas do not work, and moves beyond initial ideas likely to be ineffective (Garney et al., 2019; Wilson et al., 2018, 2017). One common method is the development of rapid prototypes used to elicit user feedback to make adaptations early on in the development process (Ferguson, 2018; Hawkins et al., 2017). Such practices avoid unnecessary investment of resources (such as time and money, among others) into programs that are not engaging, are ineffective, or are irrelevant to the intended target population.

Several public health frameworks exist to guide program development, such as the Planned Approach to Community Health (PATCH) model or the comprehensive PRECEDE-

PROCEED model, which stands for Predisposing, Reinforcing, and Enabling Constructs in Educational Diagnosis and Evaluation and Policy, Regulatory, and Organizational Constructs in Educational and Environmental Development (Green & Mercer, 2002). There are also theories to explain, predict, or guide behavior change, such as the theory of change, social cognitive theory, theory of planned behavior, transtheoretical model, and health belief model (Glanz et al., 2008; Goodson, 2009). However, some program developers recognize the limitations to the aforementioned theories, and lend themselves to nontraditional approaches with intentions of developing innovative programs (Boston University, n.d.; Garney et al., 2019).

1.2.3. Gaming in Educational Programs

The majority of evidence-based sexuality education programs today take on a traditional curriculum format, ranging anywhere from two to twenty-five sessions in length. Such lessons often involve listening to the instructor talk about the topic of the module, then engaging in an activity, such as role-play or completing activity sheets based on the content discussed. To increase youth engagement in educational programs, some program developers have turned to game-based learning as games have the potential to be both engaging and educational (Arnab & Clarke, 2017; Bouris et al., 2016; DeSmet et al., 2014; Edwards et al., 2016; Garris et al., 2002; Haruna et al., 2018; Noemí & Máximo, 2014; Zhang et al., 2017).

1.2.3.1. Game-Based Learning

Another way some developers have revised their approach to program design to make programs more engaging is through game-based learning (GBL). GBL is the utilization of a game design, with a primary purpose of educating the participants, as opposed to entertaining them (Noemí & Máximo, 2014). Much like gamification, GBL has become increasingly popular in health education programs (DeSmet et al., 2014; Gilliam et al., 2016; Haruna et al., 2018;

Uechi et al., 2018), though the concept dates back to the 1970s (Abt, 1970). As defined by Noemi and Maximo (2014) a game is, "…a physical or mental contest played according to specific rules with the goal of amusing or rewarding the participant." (p. 230). Researchers and developers support the use of game-based learning because they are effective teaching strategies that are highly attractive and motivating for the participants (Abt, 1970; Garris et al., 2002; Haruna et al., 2018; Kapp, 2012; Noemí & Máximo, 2014). While traditional games aim to entertain the user, GBL aims to educate the user through game play. When designed appropriately, the user is motivated, focused, and engaged to the point of repeated playing or returning to the game over time (Garris et al., 2002).

The utilization of GBL has several benefits beyond being a fun way for the users to learn information and skills. Researchers claim games have the potential to be influential as a source of education and skill development in communities with limited resources or social norms that do not support discussing taboo topics such as sexual health (Haruna et al., 2018). This is especially important for small and rural communities which often lack options or access to resources for health education. Furthermore, games developed collaboratively with community stakeholders can incorporate aspects of socio-cultural norms that may otherwise go unaddressed in traditional educational programming (Haruna et al., 2018). As with any program, developing a GBL program should not be completed in a vacuum. Developers should work collaboratively with community members, including the end users, to ensure the game reaches its goal in an engaging manner.

1.2.4. Design Thinking in Program Development

The process of developing innovative programs requires thoughtful strategy and techniques. One approach to innovative program development being used increasingly more in

social services stems from design thinking, and specifically focuses on human-centered design (HCD) (Bevan Jones et al., 2018; Brown & Wyatt, 2010; Collopy, 2019; Cottrell et al., 2009; Garney et al., 2019; Hendricks et al., 2018; Kasper & Clohesy, 2008; Vechakul et al., 2015; Wilson et al., 2017).

Rooted in empathy, HCD helps professionals develop a deep understanding of their target populations' needs and the underlying problems that need to be addressed (Kasper & Clohesy, 2008; Vechakul et al., 2015). HCD often involves techniques similar to qualitative research including, but not limited to, observations, interviews, contextual inquiry, and immersion (DeVoe et al., 2014; Thorne et al., 2019; Vechakul et al., 2015). Through such practices, the experiences of the end-user provides and is treated as invaluable expertise on the core problem researchers or developers may not otherwise extract (Blomqvist et al., 2010; Elsbach & Stigliani, 2018).

Upon understanding the problem at hand, program developers then engage in converging and diverging strategies to iteratively brainstorm, develop, and refine ideas, incorporating user feedback along the way (Brown & Wyatt, 2010; Kasper & Clohesy, 2008). This process continues within a rapid cycle to maintain momentum in developing a new project or service in an efficient manner (Brown & Wyatt, 2010; Ferguson, 2018). As potentially promising ideas are further developed, they are presented to end-users for feedback. This may occur through a presentation of the idea, or having the user see and try [using] an early draft of the prototype. This feedback allows developers to refine the program, service, intervention, or product while still at the drawing board, rather than having to reconstruct a fully developed program, service, or product. While still a relatively new concept to social services, HCD is increasingly being used

in health promotion and health education to further meet the needs of society through innovative programs and practices (Bazzano et al., 2017).

1.3. Supporting Innovation in Teen Pregnancy Prevention

To address disparities among underserved populations through traditional EBPs, in 2015, the U.S. Department of Health and Human Services' Office of Population Affairs (then the Office of Adolescent Health) awarded two organizations, Power To Decide and Texas A&M University, with funding to support and enable innovation in TPP (Kappeler & Farb, 2014). Innovation Next, led by Power To Decide, was geared towards innovative approaches using technology; while the Innovative Teen Pregnancy Prevention Programs (iTP_3) project, led by Texas A&M University, focused on developing innovative programs (Wilson et al., 2018). Each project served as an intermediary to fund and support organizations across the country in developing innovative approaches to address TPP.

1.3.1. Overview of the iTP_3 Project

The iTP_3 project focused on funding and support for innovative programs, loosely defined as a systematic strategy (activity(s), policies, procedures, interventions, etc.) that can be, or are, replicated or repeated in one or more settings. Programs could incorporate technology; however, the technology could not exceed 50% of the program aspects. As an intermediary, iTP_3 provided funding accompanied with capacity-building opportunities to its sub-awardees to develop innovative programs for and with their communities.

1.3.1.1. Evolving the Structure to Support Innovation

At the end of each funding cycle, iTP_3 reflected on lessons learned and adapted the structure of iTP_3 funding and the focus of capacity-building opportunities for the next funding cycle; each year converging more towards design thinking and HCD. After releasing a funding

opportunity announcement for organizations across the U.S., iTP_3 awarded fifteen organizations during the year of its inception (2016 – 2017), eight organizations the second year (2017 – 2018), and twelve organizations the third year (2018 – 2019).

At the onset, iTP_3 took a traditional approach to recruiting and selecting applicants for small grants of up to $100,000 for a 12-month period. The team disseminated a nation-wide request for proposals, through which applicants submitted a traditional grant narrative or completed a web-based application (Wilson et al., 2018). Organizations at any stage of program development preceding pilot testing were eligible for iTP_3 funding; and selected applicants focused on developing programs for under-served populations or for unique settings (Wilson et al., 2018). During this year, iTP_3 provided expert-led webinars and resources to applicants based on their capacity and needs, and connected applicants with experts deemed helpful in their program pursuits. Throughout the year, emphasis on design thinking and human-centered design (HCD) grew.

During the second year, iTP_3 followed a similar structure for recruiting and selecting applicants, though prioritized programs earlier on in stages of development. iTP_3 encouraged applicants to focus on program development opportunities extending beyond individual-level change and focus on outer ecological levels and influences. Meanwhile, previous sub-awardees could apply for continued funding to further develop their programs. Capacity-building activities during this year were offered on HCD with some systems-thinking activities and support also incorporated. At the beginning of this funding cycle, iTP_3 hosted a mandatory two-day, in-person HCD training of which all grantees sent two team members to attend. This training enabled grantees to understand and practice using HCD strategies to take back and apply in developing their program (McLeroy et al., 2017).

In the third year, iTP$_3$ dramatically shifted its structural approach in supporting the development of innovative programs. While the first two years provided support to new applicants at varying stages of program development (preceding pilot testing), the third year focused on funding new applicants that had not initiated program development. Rather than disseminating a traditional request for proposals, iTP$_3$ released a "request for host site" application. Applicants provided contextual information on the assets and disparities of their community, demonstrated the need for program development support, and identified the stakeholders they could bring together from the community to engage in a week-long HCD "boot camp". After reviewing applications for the HCD boot camp host site, iTP$_3$ selected a small organization to be the host organization – Rural Opportunity Institute (ROI), founded by two former teachers and located in rural eastern North Carolina, specifically Tarboro, NC. During this boot camp, teams of stakeholders collaboratively participated in HCD strategies and brainstormed ideas for an innovative TPP program for their community. At the end of the week each team pitched their program idea for continued iTP$_3$ funding and support.

1.3.2. Introduction to the Study Site

About 74 miles from Raleigh, NC, Tarboro is part of rural Edgecombe County, inhabited by approximately 56,000 people (EdgecombeCounty.gov, n.d.). Though it is over an hour away from a larger city, the United States Department of Agriculture classified Edgecombe County, based on the Rural-Urban Continuum Codes, as part of a metro area of fewer than 250,000 people; with a Rural-Urban Commuting Area (RUCA) code of 4, deeming it as a, "Micropolitan area core: primary flow within an urban cluster of 10,000 to 49,999" (USDA ERS, 2019). Approximately 11,415 people reside in the 11.1 square miles comprising the town of Tarboro, NC (Town of Tarboro, North Carolina, 2016); with a population density of 1,116 people per

square mile (*Tarboro, North Carolina*, 2020). Nearly 20% of Tarboro's residents live below the poverty line, exceeding the state rate by 25%; with the median household income being just above $32,000 (U.S. Census Bureau, 2018). Almost 50% of residents identify as black, 42% as white, and the remaining identifying as Hispanic (7%) and Native American (1%) (U.S. Census Bureau, 2018).

When developing a new program, it is important to contextualize the community to understand who is being served and identify potential partners or leverage points. An analysis of work inflow and outflow in 2015 found that 6,060 people employed in Tarboro lived elsewhere, 2,907 people living in Tarboro worked elsewhere, and 1,450 people lived and worked in Tarboro (North Carolina Department of Commerce, 2019). To give perspective to the workforce in Tarboro, Edgecombe County Schools employed about 1,100 people, QVC Inc (a distribution company) employed about 1,100 people, Tyson Foods (a food processing and bakery products company) employed about 950 people, and Edgecombe County (local government) employed about 650 people (North Carolina Department of Commerce, 2019). All other "major employers" located in Tarboro employed 500 or fewer people (North Carolina Department of Commerce, 2019).

In a strengths, weaknesses, opportunities, and threats (SWOT) analysis for the community's economic development strategic planning process, community members identified many factors worth recognizing. A few strengths included: business serve diverse clientele, community pride, county seat, geographically condensed, government engagement and stability, Tarboro football, Teach for America, and Walkable (North Carolina Department of Commerce, 2019). Weaknesses included: cultural shift, empty and abandoned spaces, no grocery store, no local newspaper, no public transportation, old story versus new story of Tarboro, school scores,

and perception of being stuck in the past (North Carolina Department of Commerce, 2019). Opportunities included: empty and abandoned spaces, creating positive image of small town living, improving employment of local residents, increasing county/town collaboration, and perception that nothing's new (North Carolina Department of Commerce, 2019). Lastly, threats included: aging infrastructure, college-bound people don't return, economic threat due to marketing perception, flooding, lack of newspaper, old style thinking, and larger nearby towns have higher corporate resources and relationships (North Carolina Department of Commerce, 2019).

In their application for iTP_3 support and funding, ROI described evidence of the aforementioned weaknesses and threats as to why Tarboro, NC was an ideal host site. The ROI application specifically expressed the community is in crisis due to unaddressed trauma from adverse childhood experiences (ACES), which manifest unintended pregnancies and recurring cycles of ACES (Jagannathan & Saeugling, 2017). This crisis, however, catalyzed a cross-sector group of stakeholders energized to reduce unintended pregnancy and disrupt generational cycles of poverty (Jagannathan & Saeugling, 2017).

1.3.2.1. Organizations Participating in iTP_3 HCD Boot Camp

After notification of selection, ROI recruited local community members to participate in the HCD boot camp. Fourteen stakeholders [officially] representing four organizations attended; of those, three attendees were community stakeholders not employed by the organization they represented/participated with. Participating organizations comprised: one preparatory school, one social services agency, two after-school program-type organizations. To arrive at a program idea that could be further explored and developed beyond the one-week boot camp, participants worked with people from their organization and/or community stakeholders in groups of two to

four people; for example, three attendees were community stakeholders not employed by the organization they participated with during the boot camp.

At the end of the boot camp, Michael's Angels Girls Club, Inc. (MAGC), received support and funding to proceed with further developing their program idea. Although the team ended the boot camp with a program idea, which resembled The Amazing Race, they did not have a developed program and therefore needed to continue using design activities to explore and iterate the idea. Due to the low program development capacity of this small two-person organization, moving forward, MAGC participated in a design sprint led by trained facilitators from the iTP_3 team.

1.4. Development of Using The Connect (UTC)

As MAGC only comprised two people, they convened three additional community members to be part of their design team. One member was a local young person, one from the Edgecombe County 4-H program, and one from a local social service agency who worked primarily with local adolescents. The iTP_3 design facilitation team traveled to their community once a month for four months to engage the MAGC design team in one- and two-day design sessions. In between sessions, the MAGC design team engaged with their target population and other stakeholders to gain additional insight and feedback on the ideas they were working through. This afforded user-voice to guide the development of program ideas and prototypes based on the community's wants and needs.

Through this partnership and design sprint process, MAGC designed a TPP program targeting middle school-aged youth (grades 6-8, or 11-14 years of age) called *Using the Connect* (*UTC*). Through this community-academic partnership, MAGC ideated and iterated the program design and components, while iTP_3 developed sexuality education content for *UTC* using the

National Health Education Standards (NHES) and the National Sexuality Education Standards (NSES) (Future of Sex Eduction Initiative, 2012; The Centers for Disease Control and Prevention, 2019). Designed as a set of four educational games and one take-home activity, *UTC* teaches youth sexual health knowledge and skills to prevent teen pregnancies. Each game focuses on acquiring certain knowledge or developing particular skills from the NSES including understanding the mind and body, positive communication skills, problem solving to make healthy decisions, and accessing credible information (Future of Sex Eduction Initiative, 2012). *UTC* also facilitates safe connections between youth and adults in the community through a "take-home" activity. This take-home activity included a set of eight conversation cards that enable youth to engage in two-way conversations with adults in their community.

Upon finalizing draft prototypes for the program, MAGC brought together two groups of stakeholders: a group of youth and community youth-serving adults. Each group experienced the program and provided feedback on each of the four games and the take-home activity during the last design session. During this time, community stakeholders offered comments and suggestions on the structure, style, and content of the games. The design team used this feedback, especially from the youth, to modify the program games as needed to reach a final set of prototypes for feasibility testing.

1.5. Feasibility Testing

In order to effectively expand evidence-based programs and strategies, such as *UTC*, feasibility testing at an early stage is important. According to researchers, the term "feasibility" has been misused interchangeably with the term "pilot" (Arain et al., 2010; Bowen et al., 2009; Orsmond & Cohn, 2015; Whitehead et al., 2014). Feasibility testing should allow researchers or developers to identify the relevance and potential sustainability of a program or strategy, to

determine if it is suitable for next steps and/or further testing (Arain et al., 2010; Bowen et al., 2009). It ultimately allows the developers to identify if changes are needed to the program or strategy, and how to make such changes to improve the program's efficacy (Bowen et al., 2009).

Feasibility is a broad term that is used in many ways, often as an umbrella term as feasibility studies can be employed for nearly any aspect of a program or intervention (Orsmond & Cohn, 2015; Whitehead et al., 2014). Correspondingly, researchers have proposed approximately eight areas of focus encompassed within the feasibility of a program: acceptability, demand, implementation, practicality, adaptation, integration, expansion, and limited-efficacy testing (Bowen et al., 2009). Throughout the development of a program or intervention, the developers should analyze the feasibility (in the context of reality and not "ideal" situations) by seeking to answer the questions "Can it work?", "Will it work?", and "Does it work?" (Arain et al., 2010; Bowen et al., 2009; Orsmond & Cohn, 2015). Furthermore, developers may seek to answer the aforementioned questions specific to the methods (e.g., recruitment, resources, follow-up), or the program/intervention (e.g., outcomes, efficacy, dosage, acceptability) (Arain et al., 2010; Bowen et al., 2009).

1.5.1. *UTC* Feasibility Testing Study Design

Feasibility testing allows for programs to be revised before extensive time, resources and funds are invested to fully develop a program that may not be effective, engaging, or relevant to the end users. To test UTC feasibility, a case study design was selected, which allows the researcher to focus on acceptability, implementation, and practicality of delivering *UTC* to middle school aged youth in a CBO setting. See Table 1 for a list of the research questions for this dissertation study. Acceptability focused on how acceptable the program is to the youth (Bottorff et al., 2017; Bowen et al., 2009; Garcia et al., 2010; Widman et al., 2017).

Implementation focused on the process of implementing the program in a community organization in real-life circumstances (i.e., not in ideal circumstances) (Bowen et al., 2009; Whitehead et al., 2014). Lastly, practicality focused on the efficiency of delivering *UTC* in a community organization and facilitators and barriers to successful implementation (Bowen et al., 2009; Levesque et al., 2017). This allowed the researchers to determine what modifications, if any, are needed for this program to be successfully implemented in Tarboro, NC.

Table 1.1 Research Questions

Feasibility:	**To what extent is UTC feasible for use in a community-based organization?**
Acceptability:	To what extent is *Using The Connect* acceptable to youth participants in the Tarboro, NC community?
Implementation:	To what extent can *Using The Connect* be successfully implemented/delivered to youth in a rural community-based organizational setting?
Practicality:	How practical is *UTC* for a community-based organization to teach sexual health knowledge and skills to youth?

For this study, MAGC implemented UTC three times, in-person at the MAGC facility, in Spring 2019. Each session lasted approximately four hours and entailed separate groups of youth. Across the three sessions there were a total of four facilitators – two MAGC staff and two community members.

1.6. Methods: Case-Study Protocol

This study utilized mixed methods in a single case study design (Guetterman & Fetters, 2018). The unit of investigation was the implementation of *UTC* (program), at MAGC (community based-organization), in Tarboro, NC (community); Figure 1 illustrates the program as it is embedded within its host organization (Yin, 2009). Unique to this case was a community–academic partnership between MAGC and the iTP_3 project team at Texas A&M University that fostered the development of *UTC*. This study assessed the feasibility of implementing *UTC* in a

CBO setting; therefore, the specific unit of analysis focused on feasibility of *UTC* at the organizational level. However, to adequately assess the community context (Bronfenbrenner, 1979; McLeroy et al., 1988; Wilson et al., 2017) the researcher considered the contextual and community factors surrounding the organization that may have influenced program implementation.

Figure 1. Nested Case Description for *UTC* Feasibility Testing

The overarching research question for this dissertation was, "to what extent is *UTC* feasible for use in a community-based organization?" To adequately generate and describe the case for this study, the researcher conducted this study through a constructivist paradigm. Constructivism does not support the notion of there being one observable truth (unlike positivism) (Creswell, 2013). By recognizing that people construct their own knowledge and understanding of the world through their experiences and reflection on those experiences, constructivism allows for the existence of multiple truths or realities (Creswell, 2013; Creswell & Plano Clark, 2018; Lincoln & Guba, 1985). A constructivist paradigm supports drawing from the various experiences and perspectives within a case to capture the complexity of a case

(Creswell & Plano Clark, 2018). Common among constructivism, the mixed methods of this study allowed the researcher to generate an understanding of *UTC* from the experiences of the participants (Al-Saadi, 2014; Lincoln et al., 2018). Constructivism recognizes that a researcher is not completely objective, nor detached from the study (Al-Saadi, 2014).

Therefore, examining multiple sources of data allowed the researcher to compare and contrast the perspectives of the youth participants, program facilitators, and the researcher (Creswell & Plano Clark, 2018). Additionally, the use of multiple data sources allowed for triangulation of data to generate more comprehensive conclusions (Fielding, 2012; Lincoln & Guba, 1985). As *UTC* is an innovative program designed for rural communities, generating findings from the perspectives of the participants was important to ensure it reflected their experiences in the context of their culture and community.

1.6.1. Aspects of Feasibility Driving the Study

The three areas of feasibility analyzed through this study (acceptability, implementation, and practicality) required concurrent data collection. Therefore, data for each of the three research questions (listed in Table 1.1) was collected simultaneously, but analyzed independently. The section below describes the data collection methods and supporting theoretical frameworks, followed by analysis procedures for each research question.

1.6.2. Data Collection

Four sources of data collected for this study included: user feedback from youth collected through surveys (quantitative), facilitated discussions (qualitative) with youth, observation notes collected during program implementation (qualitative), and facilitator interviews (qualitative). A description of each data collection method is provided in sections 1.6.2.1 through 1.6.2.4. Table 1.2 provides an overview of data collection tools and which aspects of feasibility each tool was

developed to assess. See Appendix A for a detailed data collection matrix, aligning each data collection method to the research questions and Appendix B for data collection tools.

Table 1.2 Data Collection Tools and Aspects of Feasibility

Data Collection Tool	Aspects of Feasibility
Observations	Acceptability Implementation Practicality
User Surveys	Acceptability Practicality
Facilitated Discussions with Youth	Acceptability Implementation Practicality
Facilitator Interviews	Acceptability Implementation Practicality

1.6.2.1. Observations

Conducting direct observations allowed the researcher to have an in-depth experience of the implementation process for *UTC*. The researcher conducted observations of program implementation for all three time points as a non-participant/observer as participant (Creswell, 2013). To build rapport with the participants, the researcher introduced herself at the beginning and participated in any "icebreaker" activities before program implementation. As a non-participating observer, the researcher was physically present in the room to watch and take field notes of what was seen, heard, and even smelt or felt (Creswell, 2013; Lincoln & Guba, 1985). The researcher noted any nonverbal communication to assist in developing a comprehensive understanding the youths' experience with the program and identify data that may need more strenuous triangulation for conclusion (Lincoln & Guba, 1985).

Throughout implementation, the researcher observed the youth, facilitator, program design, and interactions between the youth, facilitator, and program. Using an observational

protocol, the researcher specifically noted levels of engagement, questions asked throughout the program, reactions of youth and the facilitator throughout, the facilitator's role, and environmental features. Field notes included descriptive and reflective notes about the experience (Angrosino, 2007; Creswell, 2013). To be transparent, the researcher also reflected on personal thoughts, interpretations, and assumptions. At the end of each implementation period, the researcher wrote a "thick description" to generate a comprehensive narrative of the experience (Lincoln & Guba, 1985).

1.6.2.2. User Feedback Surveys

The youth completed two types of surveys: game surveys and program surveys. After completing each of the four *UTC* games, the youth (n=18) completed a survey about that game. Each game survey comprised ten four-point Likert-scale questions derived from scales used in previous research focused on feasibility testing of health education programs (Bauermeister et al., 2015; Gilliam et al., 2014, 2016; Levesque et al., 2017; National Cancer Institute, 1989; Paiva et al., 2014; Widman et al., 2017). The questions aimed to assess acceptability and practicality by focusing on participants' experiences, clarity of content and instructions, likes and dislikes, and perception of learning at each game. After completing all games, the youth completed a program survey to answer questions about their experience with *UTC* overall. This survey used questions similar to the game surveys to assess their overall experience and interest in participating in the program again.

1.6.2.3. Facilitated Discussions

After program implementation sessions ended (n=3), the researcher conducted facilitated discussion with the youth participants (n=18) to hear about their experiences. Facilitated discussions, evaluative discussions, and/or focus groups are common practice for feasibility

testing to elicit user-feedback using their own words and descriptions, and can to triangulate data collected through surveys and observations (Creswell, 2013; Creswell & Plano Clark, 2018; Miles, Huberman, & Saldana, 2017). During the facilitated discussion, youth were asked to share their opinions on the look of each station, clarity of instructions, relatability of questions/scenarios, likes and dislikes, their thoughts about creating connections with adults in their community, what they thought they learned, and who they would recommend the program to. All facilitated discussion were audio-recorded and transcribed verbatim.

1.6.2.4. Facilitator Interviews

After all three implementation sessions were complete, the researcher interviewed the program facilitators and organizational leadership to understand their perceptions on the previously listed outcomes of interest (acceptability, practicality, and implementation). There were a total of four facilitators, but only three completed interviews. Two facilitators were MAGC staff, they facilitated and assisted with facilitation of UTC during all three time points. The other two facilitators were community members with no prior exposure to UTC; they only facilitated one session each. The researcher interviewed the two MAGC staff once after all implementation was complete. One external facilitator completed an interview, while one was unreachable and therefore did not complete an interview.

While past research rarely reports interviewing facilitators in feasibility studies – only one study was found to date that entailed facilitator interviews (Bottorff et al., 2017) – interviewing "key-informants" has been identified by researchers as part of the "practicality" construct of feasibility for developing interventions (Bowen et al., 2009). During the interviews, the researcher asked facilitators (n=3) about their experience and perceptions of the implementation process and practicality of implementing *UTC* in a CBO.

1.6.3. Preparation and Procedures

Prior to the study, the study was reviewed and approved by the Texas A&M University Institutional Review Board. The researcher obtained site authorization to conduct this study at Michael's Angels Girls Club (MAGC) in Tarboro, NC. One week before implementation, the researcher checked-in with the host site via telephone to confirm logistics of implementation and data collection activities, along with each person's role. To ensure preparation during site visits, the researcher took extra copies of all tools, materials, and forms (including participant assent and parental consent forms). Additionally, the researcher read/reviewed all documents and tools prior to implementation to refresh the researchers' familiarity with the study tools and protocol.

MAGC implemented the program three times, providing three data collection timepoints. At the end of each implementation period, the researcher generated a thick description to create a comprehensive narrative of the experience, primarily detailing and expanding on the observation notes.

1.6.4. Data Analysis

The researcher created a case study database to increase the reliability of the study (Yin, 2009). The database comprised case study notes, case study documents (e.g., data collection documents and transcripts), and tabular materials (e.g., survey data). Throughout the study, the researcher entered all data into the database as it was collected.

The data analysis process for this dissertation study occurred in three phases. Phase 1 entailed quantitative data analysis of user feedback surveys. Phase 2 comprised reviewing and coding qualitative data which was analyzed thematically. Lastly, during Phase 3, the researcher constructed a matrix to triangulate key findings. The following sections detail the methods and theoretical support for each phase.

1.6.4.1. Phase 1 – Analyze Quantitative Data

Upon collecting all data, the researcher analyzed quantitative data collected through surveys using Stata. The researcher ran descriptive statistics of survey responses (specifically means, medians, and frequencies) and Fisher's Exact Tests to identify statistically significant differences among survey responses.

1.6.4.2. Phase 2 – Analyze Qualitative Data

The researcher assembled and trained a data analysis team, comprising three coders/reviewers, to review, code, and analyze qualitative data. Following the procedures of collaborative qualitative analysis (CQA), grounded in thematic analysis (Boyatzis, 1998), increased trustworthiness of findings and reduced bias by drawing on the perspectives of multiple reviewers (Olson et al., 2016; Patton, 2015; Richards & Hemphill, 2018). Each team member reviewed and coded each source of qualitative data (thick descriptions and transcripts), separately, by generating codes, through use of both preexisting codes and an emergent- or open-coding process.

Some qualitative methodologists argue "preexisting" codes establish categories derived from key concepts of the research, but limit the researchers' understanding of the data (Creswell, 2013). Other methodologists support an open-coding mechanism to identify codes that, according to John Creswell (2013), "...reflect the views of participants..." This study coupled emergent codes with preexisting codes to deepen the researchers' understanding and interpretation of the data (Glaser & Strauss, 1967; Richards & Hemphill, 2018; Yin, 2014). Preexisting codes for this study were established using the consolidated framework for implementation research (CFIR), a framework for formative evaluation to increase implementation knowledge (Damschroder et al., 2009). Key domains from CFIR encompassed

the initial codebook; however, the codebook was a working document, modified by the research team throughout the review process.

After research team members reviewed and coded all qualitative data, they categorized final codes into themes, reaching saturation from the three time points of data. To ensure validation of data, the research team calculated interrater reliability coefficients. See Figure 2 for a graphical representation of this process. The research team employed these strategies to analyze qualitative data in three parts, repeating steps two through four from Figure 2, to focus analysis efforts first on data from each source related to acceptability, then implementation, followed by practicality.

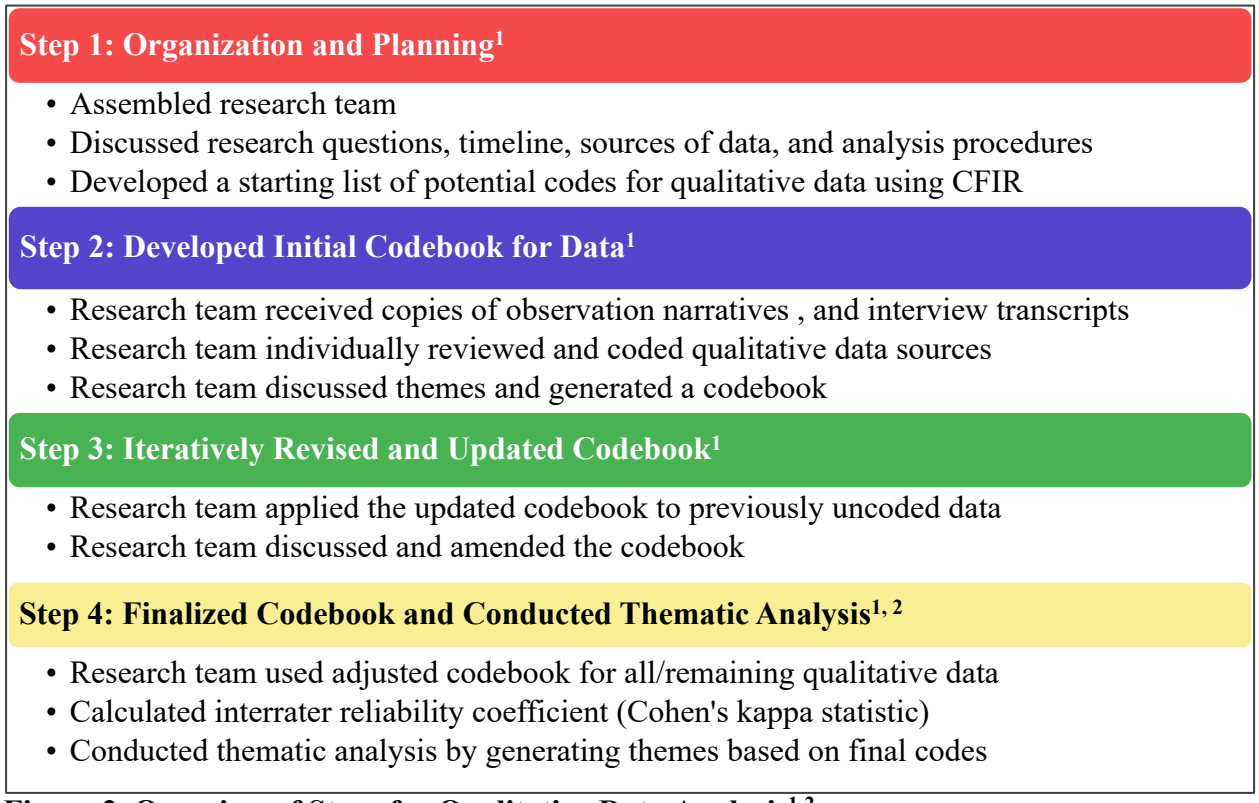

Figure 2. Overview of Steps for Qualitative Data Analysis[1,2]

[1] Procedural steps for collaborative qualitative analysis outlined by Richards, K. A. R., & Hemphill, M. A. (2018). A Practical Guide to Collaborative Qualitative Data Analysis. *Journal of Teaching in Physical Education*, 37(2), 225–231

[2] Procedural steps for qualitative analysis outlined by Miles, M., Huberman, A.M., & Saladana, J. *Qualitative Data Analysis: A Methods Sourcebook.* Helen Salmon, Kaitlin Perry, Kallie Koscielak, Laura Barrett (Eds.). Los Angeles, California: Sage.

1.6.4.3. Phase 3 – Triangulate Data to Draw Conclusions

After conducting thematic analyses and finalizing themes, the researcher constructed matrix to organize and display qualitative and quantitative data (Creswell & Plano Clark, 2018; Miles et al., 2017). The matrix was used to identify potential connections or relationships between themes. This final step was conducted for data regarding acceptability, then implementation, followed by practicality of *UTC*. Additionally, it allowed the researcher to triangulate the multiple sources of data from the study (Fielding, 2012; Miles et al., 2017).

1.7. Implications for Health Education

This study impacted the Tarboro, NC community in several ways. It exposed the participating youth to a sexual health program. Though youth only participated in the program once, rather than repeatedly over time, *UTC* equipped them with knowledge and skills outlined in the National Sexuality Education Standards as essential to their sexual health (Future of Sex Eduction Initiative, 2012). It also helped move *UTC* one step closer towards pilot testing and full implementation in the community, as feasibility testing is essential to inform program modifications and future testing (Arain et al., 2010; Bowen et al., 2009; Orsmond & Cohn, 2015; Whitehead et al., 2014).

Additionally, findings from this study contribute to the fields of TPP and health education to understand the feasibility of an innovative program, specifically intended for implementation in a rural community-based setting. It also contributes to the field by identifying factors that make a program "feasible" – acceptable, practical, and implementable – within a community setting or organization and contribute to the literature on analyzing specific aspects of a program's "feasibility". This study helps health education professionals understand how to make programs ideally situated for implementation in a rural community setting, which is currently

lacking in TPP EBPs (US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2017b; Wilson et al., 2017).

1.8. Dissertation Dissemination Format

This dissertation study is written in a journal article (manuscript) format, as approved by the Department of Health and Kinesiology. Utilizing a journal article format enabled the researcher to write separate journal articles utilizing data collected through observations, surveys, facilitated discussions, and interviews on the acceptability, implementation, and practicality of *UTC*. Below is a description of the contents for this dissertation study:

- Chapter 1 – Introduction to the study and contextual background to support the need for this dissertation study.
- Chapter 2 – Report of the mixed methods case study evaluating the acceptability of *UTC*. This chapter encompasses the first journal article.
- Chapter 3 – Report of the mixed methods case study assessing the implementation of *UTC* in a community-based setting. This chapter encompasses the second journal article.
- Chapter 4 –Report of the mixed methods case study analyzing the practicality of implementing *UTC* in a community-based setting. This chapter encompasses the third journal article.
- Chapter 5 – Conclusions for chapters 2-4, and overall conclusions of the dissertation study.

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2. YOUTH ACCEPTABILITY OF A GAME-BASED LEARNING PROGRAM TO PREVENT TEEN PREGNANCY

2.1. Introduction

For decades, adolescent health has remained one of the nation's priorities as reflected through national, state, and community efforts. Though controversy exists in how to address and achieve it, there is a consensus in the need to address teen pregnancy rates as a national goal to reduce pregnancy among youth ages 15-19 remains (Healthy People 2020, 2020). While researchers and practitioners have made progress in this goal (Brindis, 2017; Garney et al., 2018; Kappeler & Farb, 2014; Livingston & Thomas, 2019; O'Donnell et al., 2002), current rates show there is work to do and disparities to address in reducing teen pregnancy rates and achieve health equity (Bulanda & McCrea, 2013; Jenner et al., 2016; Martin et al., 2019).

2.1.1. Trends and Disparities in Adolescent Sexual Health

In 2018, the teen birth rate for all females ages 15-19 was 17.4 per 1,000; or 7.2 for females ages 15-17, and 32.3 for females ages 18-19 (Martin et al., 2019). While these rates are record lows for the United States, breaking out rates by race and ethnicity highlight disparities among black, indigenous, and people of color. While the teen birth rates for white females ages 15-19 was 12.1, teen birth rates for non-Hispanic black, American Indian or Alaska Native, Native Hawaiian or other Pacific Islander, and Hispanic females far exceeded those of their white peers (Martin et al., 2019). Teen birth rates for the aforementioned racial and ethnic groups ranged from 26.3 to 29.7 (Martin et al., 2019). Additional disparities in teen birth rates persist for rural youth of America, as teen birth rates in urban counties have decreased significantly more than those in rural counties (Hamilton et al., 2016). Specifically, teen birth rates in rural counties

(30.9 per 1,000 females ages 15-19) are nearly twice that of national rates (18.9 per 1,000 females ages 15-19) (Hamilton et al., 2016).

Though more difficult to measure and track, teen pregnancy and abortion rates have also hit a new low (Wind, 2017). In 2013, the teen pregnancy rate for females ages 15-19 dropped to 43 per 1,000, and abortion rates for females ages 15-19 dropped from 18 per 1,000 in 2008 to 11 per 1,000 in 2013 (Wind, 2017).

2.1.2. Efforts to Support Teen Pregnancy Prevention

Researchers attribute much of the success in the declining rates of teen pregnancy and teen birth to sexuality education programs in schools and community organizations, increased access to health care services and contraceptive methods, and messages in the media around sexual health (Levine, 2014; Livingston & Thomas, 2019). In a systematic review of TPP program impacts (analyzing studies from 1989 – 2010 with comparison and/or control groups), researchers identified the following: 1) 22 out of 31 programs impacted sexual activity; 2) 14 out of 31 impacted contraception use or consistency; and 3) five out of 31 impacted pregnancy or birth (Goesling et al., 2014). Thus, support and resources for sexuality education programs has increased across the nation in the last ten years.

Since establishing both the Teen Pregnancy Prevention (TPP) program and Personal Responsibility Education Program (PREP) in 2010, the federal government has allocated hundreds of millions of dollars to support communities in implementing evidence-based programs (EBPs), and more recently, developing innovative programs (Guttmacher Institute, 2017; Kappeler & Farb, 2014; US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2017a). Such funds enabled communities to serve over one million young people in the United States through program

implementation and development efforts (US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2017a).

The federal government currently recognizes over 40 EBPs to reduce teen pregnancy, many of which are being implemented across the country through grant supported projects (US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2017b). While these programs have helped contribute to decreases in both teen pregnancy and birth, the disparities in teen birth and pregnancy are also reflected in existing programs. Out of the 40+ EBPs, only one is intended for rural communities (US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2017b).

To fill the gaps in existing EBPs, the U.S. Department of Health and Human Services' Office of Population Affairs (OPA) established funding to support and enable innovative TPP program development. One project supported by this OPA funding tier is the Innovative Teen Pregnancy Prevention Programs (iTP_3) Project at Texas A&M University. The iTP_3 project is an intermediary that provides funding coupled with capacity building support to organizations across the country to develop innovative programs for their communities. In 2018, the iTP_3 team began working with Michael's Angels Girls Club, Inc. (MAGC), a community-based organization in Tarboro, NC, after they participated in a human-centered design bootcamp led by iTP_3 to develop an innovative program.

2.1.3. Developing an Innovative Program

MAGC is a small non-profit in Tarboro, NC, in Edgecombe County. From 2014 to 2018, the teen birth rate for Edgecombe County was 47 per 1,000; which breaks down to 33.4 for White youth, 53.3 for African American youth, and 53.6 for Hispanic youth (North Carolina

Department of Health and Human Services, 2019; SHIFT NC, n.d.), reflecting national disparities (Martin et al., 2019). In 2018, Edgecombe County experienced a 12% decrease in teen birth as the rate for youth ages 15-19 dropped to 30.3 (North Carolina Department of Health and Human Services, 2019), though still almost twice that of the country.

In an effort to bring change to their community, stakeholders from Tarboro, NC and the surrounding Edgecombe County community convened for a human-centered design (HCD) "boot camp" led by the iTP_3 project team in December 2017. After four days of intensive activities to further understand their community and its needs, one organization, MAGC, ended the boot camp with a promising program idea. To build out their program idea, the design team engaged in a design sprint, which comprised one and two-day workshops occurring once a month for four months in Fall 2018. During the workshops, the design team engaged in HCD activities to ideate and iterate program components. In between sessions, the design team shared their ideas and progress with youth and other community stakeholders for feedback to use moving forward.

2.1.3.1. Program Overview

The MAGC design team ended with an innovative, game-based learning (GBL) program, *Using The Connect* (*UTC*). Designed as a set of games, *UTC* consists of four games to play in a facilitated environment, and one take-home activity for the youth to complete on their own. While traditional games aim to entertain the user, GBL aims to educate the user through game play (Noemí & Máximo, 2014). Researchers and developers support the use of GBL because it is an effective teaching strategy that is highly interactive, attractive, and motivating for participants (Abt, 1970; Garris et al., 2002; Haruna et al., 2018; Noemí & Máximo, 2014). When designed appropriately, the user of GBL is motivated, focused, and engaged to the point of repeated

playing or returning to the game over time (Garris et al., 2002). Research shows GBL cultivates critical thinking, motivates youth to apply knowledge and skills, and increases confidence levels (Cicchino, 2015; Harrold & Fuller, 2015; Haruna et al., 2018).

UTC is a game-based learning, sexual health program for youth in grades 6 – 8. It helps create safe connections between youth and adults, and teaches youth sexual health knowledge and skills (accessing information, positive communication, problem solving and decision-making) to prevent teen pregnancies. Each activity and game of the program focus on a different skill set (as mentioned previously). The facilitated games are designed for groups of four to six youth to play at a time. While there is not a specific amount of time required for each game, it typically takes approximately 20 minutes to complete at least one round of each game. This follows pedagogy recommendations as the average attention span is approximately 15-30 minutes (Hattie & Yates, 2013). See Appendix C for a detailed description of the games.

The developers aimed to make *UTC* user-friendly so that organizations would consider it to be "easy-to-use." As such, the program comes with a facilitator manual that provides step-by-step instructions for facilitators to reduce training requirements. The manual includes copies of all game instructions and content along with facilitation tips. As the sexuality education content is incorporated into the games, *UTC* does not utilize didactic teaching, which minimizes the background and experiences required of facilitators.

In HCD fashion, the program team solicited user insight and feedback throughout the program development process to ensure it met the wants and needs of the community. Though reaching a final program prototype warranted early testing of the program.

2.1.4. Assessing Program Acceptability

Feasibility testing entails assessing the program at early stages to determine if it is relevant and shows promise of sustainability (Arain et al., 2010; Bowen et al., 2009). This allows researchers and developers to test the program on a smaller scale to determine if the program can work, will work, or does work based on its purpose (Arain et al., 2010; Bowen et al., 2009; Orsmond & Cohn, 2015). Researchers and developers must assess a program's feasibility early on to determine if the program is suitable to advance on for organizations to invest efforts and resources in formal pilot testing (Arain et al., 2010; Bowen et al., 2009).

However, feasibility is not one simple aspect of a program. Program feasibility is a larger concept entailing eight aspects: acceptability, demand, implementation, practicality, adaptation, integration, expansion, and limited-efficacy testing (Bowen et al., 2009). Many researchers have published about the feasibility of studies, but few focused on the acceptability of the program to its participants (Bauermeister et al., 2015; Bottorff et al., 2017; Garcia et al., 2010; Paiva et al., 2014; Widman et al., 2017).

This research study focuses on the acceptability of an innovative teen pregnancy prevention program known as *Using The Connect* (*UTC*). Acceptability is the extent to which participants deem a program as "suitable, satisfying, or attractive" (Bowen et al., 2009). As a game-based learning program, the primary purpose of *UTC* is to educate the youth about sexual health through games (Noemí & Máximo, 2014). It is important the youth not only learn by participating in *UTC*, but have fun playing the games and desire to participate in the program. Games, as teaching strategies, should be attractive, motivating, and engaging to the participants (Abt, 1970; Garris et al., 2002; Haruna et al., 2018; Kapp, 2012; Noemí & Máximo, 2014). Ultimately, the games should capture and hold the participants' focus so well that they not only

want to keep playing, but return to the program again (Garris et al., 2002). Therefore, youth acceptability is imperative to the program design.

As the user's experience and perspective of the program is integral to their buy-in and future/continued participation, this study focused on how acceptable the program was to youth (Bottorff et al., 2017; Bowen et al., 2009; Garcia et al., 2010; Widman et al., 2017). Thus, the research question guiding this study is, *to what extent is Using The Connect acceptable to youth participants in the Tarboro, NC community to learn sexual health knowledge and skills*?

2.2. Methods

The purpose of this study was to identify the acceptability of *Using The Connect* (*UTC*) among youth participants in Tarboro, NC as a sexual health program to teach knowledge and skills essential to prevent teen and unintended pregnancy through user feedback. Staff at MAGC implemented the program, *UTC*, three separate times in spring 2019, providing three time points of data collection. The researcher traveled to Tarboro, NC to collect data during each implementation session. The researcher utilized mixed methods in a single case study design to collect and analyze both qualitative and quantitative data including youth surveys, facilitated discussions with youth, and observations.

2.2.1. Theoretical Framework

The philosophical assumption underlying this study is that of a constructivist approach. Constructivism recognizes multiple realities are created based on participant experiences and the understanding they form from such experiences, rather than one truth (Creswell, 2013). For this study, the researcher recognized youth are likely to have different experiences of participating in UTC and wanted to capture and learn from each of them. Through a constructivist approach, the researcher sought to uncover the various perspectives and experiences of youth that participated

in the program (Lincoln et al., 2018; Lincoln & Guba, 1985; Mertens, 2019). The many perspectives emerged throughout the multiple sources of data within the study and assisted researchers in understanding and describing the complexity of *UTC* as a teen pregnancy prevention program (Creswell & Plano Clark, 2018).

2.2.2. Program Implementation

Four facilitators implemented *UTC,* in a face-to-face manner, three times over the course of three months at the MAGC facility. Two facilitators were MAGC staff and two were external to MAGC (one was a health educator for the county health department, one was a high school senior). Each implementation session took place on a Saturday from 10am to 2pm (once a month in January, February, and March). The facilitators set up each game at separate tables dispersed around the room to prevent distractions and allow for multiple groups to participate in different games at the same time if needed. The facilitators led the youth through *UTC*, playing one game at a time. During the January session, a second group of youth arrived late, so the MAGC staff split and each led one of the two groups at the same time. The youth played each game for approximately thirty minutes.

Upon arriving at the MAGC facility, in downtown Tarboro, NC, the researcher provided participants with an overview of the program, and informed them about the research activities taking place during and after program implementation. The MAGC staff led the youth through the program, playing one game at a time. During the January session, a second group of youth arrived late, so the MAGC staff split and each led one of the two groups at the same time. The youth played each game for approximately thirty minutes. To build rapport with youth, the researcher introduced herself; she let the youth know who she was, and that she was there to gather insight on their experiences with the program. Such information would then guide

program improvements and revisions to increase level of engagement and/or enhance youth learning through participation.

2.2.3. Participants

The researcher used a convenience sample for this study. Participants (n=18) for this study were youth attending MAGC to participate in scheduled UTC program activities. Thus, the researcher did not recruit youth to participate in the program; but recruited youth participating in UTC to also participate in the research activities. All *UTC* participants received parental consent, and assented to partake in the research and data collection activities. Section 2.3.1 provides demographic information about youth participants.

2.2.4. Lead Researcher

The lead author and researcher of this study, leading all data collection and analysis activities, was a full-time doctoral student at Texas A&M University in College Station, TX (who identifies as a Caucasian female). At the time of this study she was a Certified Health Education Specialist, had a Master of Education in Health Education, and had completed all course work for her Doctor of Philosophy in Health Education. Throughout graduate school, the researcher engaged in extensive training on research methods and qualitative and quantitative data collection and analysis techniques. Her past experience comprised program development and evaluation in adolescent health, particularly focused on adolescent sexuality education.

2.2.5. Data Collection

All data collection activities for this study took place at the MAGC facility in Tarboro, NC. Following MAGC program protocol, only participating youth and staff were present during program implementation and data collection activities to ensure confidentiality and comfort. While the overarching study entailed four sources of data (observations, youth surveys,

facilitated discussions with youth, and facilitator interviews); researchers focused on data sources yielding insight to program acceptability among youth for this study (youth surveys and facilitated discussions with youth). Prior to implementation and data collection, this study was approved by the Texas A&M University Institutional Review Board.

2.2.5.1. Quantitative Data: Youth Surveys

Before participating in program activities, each youth received a folder with surveys inside, one for each of the four games and one for the program overall. To maintain confidentiality, the researcher instructed them not to write their names on the surveys; rather, they could write their initials on the front page to know which folder belonged to them in case they got mixed up. After completing each program game, the youth completed a survey about that game. Each game survey contained ten four-point Likert-scale questions derived from scales used in previous program feasibility research studies (Bauermeister et al., 2015; Gilliam et al., 2014, 2016; Levesque et al., 2017; National Cancer Institute, 1989; Paiva et al., 2014; Widman et al., 2017). The questions assessed participants' experiences, likes and dislikes, and perception of learning at each game. After completing all games, the youth completed a program survey to answer questions about their experience with the program as a whole. This survey used questions similar to the game surveys to assess their overall experience, likes and dislikes, perception of learning, and interest in participating in the program again. All but three questions on the program survey used four-point Likert-scale responses, the remaining questions included dichotomous responses (e.g., Yes or No) and one open-ended questions to report whom they planned to talk with about information from the program, and provide additional comments or feedback on the program. See Table 2.1 for a list of all survey questions for the games, and Table 2.2 for program survey questions.

Table 2.1 Survey Questions for Games.

Games	Questions	Response Scales
All	This station was easy to play	SA (1) – SD (4)
All	The questions were easy to understand	SA (1) – SD (4)
All	I like the way this station looked	SA (1) – SD (4)
All	This station was interesting	SA (1) – SD (4)
All	This station gave me new things to think about	SA (1) – SD (4)
All	I would play this station again	SA (1) – SD (4)
All	How much did you learn from this station?	A lot (1) – Nothing (4)
All	How much did you like this station?	Loved it (1) – Didn't like it (4)
MB	This station taught me about changes that happen to peoples bodies as they grow up.	SA (1) – SD (4)
MB	This station taught me how people's minds/emotions may change as they grow up.	SA (1) – SD (4)
AI	This station taught me how to access credible health information	SA (1) – SD (4)
AI	This station taught me where to go for credible health information	SA (1) – SD (4)
C	This station taught me how to communicate about health	SA (1) – SD (4)
C	This station taught me how to talk about health with different people	SA (1) – SD (4)
DM	This station taught me to think through decisions before I act on them	SA (1) – SD (4)
DM	This station taught me to think about different options before I make a decision	SA (1) – SD (4)

Key for Games

MB = Questions asked only for the mind and body game, *The Sum of The Parts*.

AI = Questions asked only for the accessing information game, *Tapped In*.

C = Questions asked only for the communication game, *More Than Words*.

DM = Questions asked only for the decision-making game, *Stop • Think • Act*.

Response Scale Key

SA = Strongly agree

SD = Strongly disagree

Table 2.2 Survey Questions for Program (Overall)

Question	Response Scale
This game was easy to play	SA (1) – SD (4)
The questions were easy to understand	SA (1) – SD (4)
I like the way the program looked	SA (1) – SD (4)
The program was designed for people my age	SA (1) – SD (4)
The program was interesting	SA (1) – SD (4)
I enjoyed playing the games	SA (1) – SD (4)
The program gave me new things to think about	SA (1) – SD (4)
The program could help people learn about sexual health	SA (1) – SD (4)
The program could help people learn how to talk to adults in their community	SA (1) – SD (4)
The program could help people learn how to access credible health information	SA (1) – SD (4)
The program could help people learn how to communicate better	SA (1) – SD (4)
The program could help people learn how to make healthy decisions	SA (1) – SD (4)
Would you recommend this program to a friend?	Yes (1) or No (2)
Would you want to participate in this program again?	Yes (1) or No (2)
Do you think you will use information from the program in the future?	Yes (1) or No (2)
In the next three months, who do you think you will talk to about the information you learned in this program?	Open-ended
Any other thoughts or comments about the program?	Open-ended

Response Scale Key
SA = Strongly agree
SD = Strongly disagree

2.2.5.2. Qualitative Data: Facilitated Discussions

Once the youth participated in all program games, the researcher conducted a facilitated discussion with the youth participants to hear about their experiences. Facilitated discussions, evaluative discussions, and/or focus groups are common practice for feasibility testing to elicit user-feedback using their own words and descriptions, and can allow researchers to triangulate data collected through surveys and observations (Creswell, 2013; Creswell & Plano Clark, 2018; Miles, Huberman, & Saldana, 2017). The researcher developed a facilitated discussion guide with an introductory script and questions to guide the discussion; see Table 2.3 for a list of

facilitated discussion questions. As with the youth surveys, researchers derived the questions in the guide from past research on similar studies (Gilliam et al., 2014, 2016; Levesque et al., 2017; Widman et al., 2017), along with the CFIR constructs.

Table 2.3 Facilitated Discussion Questions with Youth Participants

Construct	Questions
Intervention Characteristics	• What did you think about the program overall? • Tell me about your likes and dislikes. • Share with me your opinions about the look of each station. Thinking about the pictures, colors, setup, materials, etc. • What did you think about the questions and scenarios for each station? Were they relatable? What about the names of the characters?
Implementation Process	• Tell me about the instructions for each of the stations. Were they easy to understand? • Tell me about the process of playing at each station. Did you need someone, like a teacher, to help and guide you?
Characteristics of Individuals	• Share with me what you think you learned through this program. • Would you want to participate in this program again? The whole thing or certain parts?
Multiple or Other	• Tell me about your thoughts on creating safe connections with adults in your community. • Who would you recommend this program to? Who would you talk to about this program? • What is your favorite thing about this program? Least favorite? • What did you think about the program overall?

During the facilitated discussion, the researcher asked youth to share their opinions on the look of each station, clarity of instructions, relatability of questions/scenarios, likes and dislikes, their thoughts about creating connections with adults in their community, what they think they learned, and who they would recommend the program to. As permitted by all participants, the facilitated discussion were audio-recorded and transcribed verbatim for analysis. All facilitated discussions lasted approximately 25 minutes. During the facilitated discussion, the researcher took field notes to capture non-verbal responses among the group, to add additional substance to the facilitated discussion transcripts that could not be captured in the audio recordings. Due to

restraints in contacting the youth after completing data collection activities, the transcripts were not returned to youth for comments or corrections.

2.2.6. Data Analysis

2.2.6.1. Quantitative Data: Youth Surveys

Upon collecting all data, the researcher analyzed all quantitative data (collected through surveys) using Stata Statistical Software (StataCorp, 2019). The researcher ran descriptive statistics (specifically means, medians, and frequencies) of survey responses, and Fisher's Exact Tests to identify significant differences among survey results. The sample size (n=18) was too small to run advanced statistical analyses and test for significant differences.

Throughout each implementation session, the youth completed surveys for the games they participated in, and an overall program survey before leaving. For this study, the researcher analyzed survey results for all time points.

2.2.6.2. Qualitative Data: Facilitated Discussion

Though youth participated in facilitated discussions for all three implementation sessions, the researcher team only analyzed the transcript for time point three for this study. The facilitated discussions offered a chance for youth to provide more context on their experience with the program games, and offer suggestions for revisions whether it included question wording, instructions, content, logistics, game materials, etc. The program developers utilized youth feedback after time points one and two to edit program materials before implementation sessions two and three. Therefore, as the games went through additional modifications after time points one and two, the facilitated discussion transcripts for these two time points were excluded in this analysis to focus on their elaborations of the final program structure.

Two additional graduate students, trained in qualitative research and data analysis methods, assisted in reviewing and coding qualitative data. The team of researchers followed the procedures of collaborative qualitative analysis (CQA), grounded in thematic analysis (StataCorp, 2019), to increase trustworthiness of findings and reduce bias by drawing on the perspectives of multiple reviewers (Olson et al., 2016; Patton, 2015; Richards & Hemphill, 2018). Each person first independently reviewed the facilitated discussion transcript for time three to familiarize themselves with the data, then went back and coded individual units of data.

During the coding process, the lead researcher instructed the reviewers to use a combination of pre-existing codes derived from the Consolidated Framework for Implementation Research (CFIR), and an open-coding mechanism. Some qualitative methodologists argue "preexisting" codes establish categories derived from key concepts of the research, but limit the researchers' understanding of the data (Creswell, 2013). Meanwhile, other methodologists support an open-coding mechanism to identify codes that, according to John Creswell (2013), "...reflect the views of participants..." This study coupled emergent codes with preexisting codes to deepen the researchers' understanding and interpretation of the data (Glaser & Strauss, 1967; Richards & Hemphill, 2018; Yin, 2014). Preexisting codes for this study were established using the CFIR guidelines (Damschroder et al., 2009). Key domains encompassed the initial codebook; however, the codebook was treated as a working document, and therefore modified by the research team throughout the review process. The research team completed the qualitative analysis process for this study with an inter-rater reliability coefficient of 0.96.

2.2.6.3. Triangulating Quantitative and Qualitative Data

Upon analyzing quantitative and qualitative data, the researcher integrated the results of both datasets to combine and compare findings. Such integration allowed the researcher to

confirm, and expand results to provide insight into the acceptability of the *UTC* program among youth participants (Creswell & Plano Clark, 2018).

2.3. Results

2.3.1. Descriptive Information about Participants

Table 2.4 provides a breakdown of the youth participant demographics (specifically sex) for each time point. All youth participants (n=18) were between the ages of 11-14, identified as African American, and attended school in Tarboro, NC. Due to this program being in early stages of feasibility testing as part of continued program development practice, researchers did not collect information regarding sexual orientation and sexual behavior.

During each implementation session, the number of youth participants varied for each game due to schedule constraints and commitments. Most youth participated in three or four games; see Table 2.5 for a breakdown of participants for each game during each implementation session.

Table 2.4 Youth Participant Demographics

Sex	Session 1	Session 2	Session 3	ALL
Male	40% (n = 4)	66.7% (n = 2)	0% (n = 0)	33.3% (n = 6)
Female	60% (n = 6)	33.3% (n = 1)	100% (n = 5)	66.7% (n = 12)

Table 2.5 Breakdown of Sample by Game and Implementation Session

Participants by Game		Session 1	Session 2	Session 3	All
The Sum of The Parts (Mind and Body)	Male	*n = 3*	*n = 2*	*n = 0*	*n = 5*
	Female	*n = 6*	*n = 1*	*n = 5*	*n = 12*
	TOAL	n = 9	n = 3	n = 5	n = 17
Tapped In (Accessing Information)	Male	*n = 4*	*n = 2*	*n = 0*	*n = 6*
	Female	*n = 5*	*n = 1*	*n = 5*	*n = 11*
	TOAL	n = 9	n = 3	n = 5	n = 17
More Than Words (Communication)	Male	*n = 0*	*n = 2*	*n = 0*	*n = 2*
	Female	*n = 5*	*n = 1*	*n = 5*	*n = 11*
	TOAL	n = 5	n = 3	n = 5	n = 13
Stop • Think • Act (Decision Making)	Male	*n = 4*	*n = 2*	*n = 0*	*n = 6*
	Female	*n = 4*	*n = 1*	*n = 5*	*n = 12*
	TOTAL	n = 8	n = 3	n = 5	n = 16

2.3.2. Quantitative Data: Youth Surveys

As there were two types of surveys, the research began by first analyzing the results of the surveys for each of the four games, then analyzed the program survey results. The results of each set of surveys are presented below.

2.3.2.1. Descriptive Information for Game Surveys

Overall, the youth found each of the games to be highly acceptable; see Table 2.6. For displaying results in a table, responses were condensed to "Agree" (strongly agree and agree) and "Disagree" (strongly disagree and disagree). Specifically, 94% of all youth reported they would play *The Sum of The Parts* again, 88% reported they would play *Tapped In* again, 77% reported they would play *More Than Words* again, and 62% reported they would play *Stop • Think • Act* again. *The Sum of The Parts* consistently ranked the highest out of all games; specifically, 88% of youth reported learning a lot from the game, 100% really liked or loved the game, 100% reported learning about changes to the body, and 94% reported learning about changes to the mind and emotions through this game. See Table 2.6 for a breakdown of participant responses for each game by implementation session.

Due to the small sample size for each implementation session, the researcher conducted Fisher's Exact Tests to examine potential differences among survey responses for each implementation group, and differences in responses by sex. Fisher's Exact Tests showed statistically significant differences by group for the variables "learn" and "like" for game three, *More Than Words*. On average, youth in group three reported learning more in the *More Than Words* game ($p=0.046$), and were more likely to report "loved it" ($p=0.027$) than youth in groups one and two. This is particularly worth noting as program developers modified this game after the first two implementation sessions. Therefore, these results indicate the acceptability of the

Table 2.6 Youth Survey Results for Games by Group

		Session 1		Session 2		Session 3		All	
		Agree n (%)	Disagree n (%)	Agree n (%)	Disagree n (%)	Agree n (%)	Disagree n (%)	Agree n (%)	Disagree n (%)
The Sum of The Parts	• Would play again	9 (100%)	0 (0%)	3 (100%)	0 (0%)	4 (80%)	1 (20%)	16 (94%)	1 (6%)
	• Learned a lot	7 (78%)	2 (22%)	3 (100%)	0 (0%)	5 (100%)	0 (0%)	15 (88%)	2 (12%)
	• Liked this game	9 (100%)	0 (0%)	3 (100%)	0 (0%)	5 (100%)	0 (0%)	17 (100%)	0 (0%)
	• Learned about changes to body	9 (100%)	0 (0%)	3 (100%)	0 (0%)	5 (100%)	0 (0%)	17 (100%)	0 (0%)
	• Learned about changes to mind/emotions	8 (89%)	1 (11%)	3 (100%)	0 (0%)	5 (100%)	0 (0%)	16 (94%)	1 (6%)
Tapped In	• Would play again	8 (89%)	1 (11%)	2 (67%)	1 (33%)	5 (100%)	0 (0%)	15 (88%)	2 (12%)
	• Learned a lot	8 (89%)	1 (11%)	3 (100%)	0 (0%)	5 (100%)	0 (0%)	16 (94%)	1 (6%)
	• Liked this game	7 (87%)	1 (13%)	2 (67%)	1 (33%)	5 (100%)	0 (0%)	14 (87%)	2 (13%)
	• Learned how to access credible info	6 (75%)	2 (25%)	3 (100%)	0 (0%)	5 (100%)	0 (0%)	14 (87%)	2 (13%)
	• Learned where to go for credible info	8 (100%)	0 (0%)	3 (100%)	0 (0%)	5 (100%)	0 (0%)	16 (100%)	0 (0%)
More Than Words	• Would play again	4 (80%)	1 (20%)	1 (33%)	2 (67%)	5 (100%)	0 (0%)	10 (77%)	3 (23%)
	• Learned a lot	3 (60%)	2 (40%)	1 (33%)	2 (67%)	5 (100%)	0 (0%)	9 (69%)	4 (31%)
	• Liked this game	(80%)4	1 (20%)	3 (100%)	0 (0%)	5 (100%)	0 (0%)	12 (92%)	1 (8%)
	• Learned how to communicate	3 (60%)	2 (40%)	3 (100%)	0 (0%)	5 (100%)	0 (0%)	11 (85%)	2 (15%)
	• Learned how to talk to different people about health	4 (80%)	1 (20%)	3 (100%)	0 (0%)	5 (100%)	0 (0%)	12 (92%)	1 (8%)
Stop • Think • Act	• Would play again	5 (63%)	3 (38%)	0 (0%)	3 (100%)	5 (100%)	0 (0%)	10 (62%)	6 (38%)
	• Learned a lot	6 (75%)	2 (25%)	1 (33%)	2 (66%)	4 (80%)	1 (20%)	11 (69%)	5 (31%)
	• Liked this game	6 (86%)	1 (14%)	1 (33%)	2 (66%)	5 (100%)	0 (0%)	12 (80%)	3 (20%)
	• Learned how to think through decisions before act	5 (71%)	2 (29%)	3 (100%)	0 (0%)	5 (100%)	0 (0%)	13 (87%)	2 (13%)
	• Learned how to think about different options for a decision	5 (71%)	2 (29%)	3 (100%)	0 (0%)	5 (100%)	0 (0%)	13 (87%)	2 (13%)

game increased as modifications occurred. The researchers found no statistically significant differences in the game survey responses by sex.

2.3.2.2. Descriptive Information for Program Surveys

Youth appeared to find the *UTC* program highly acceptable as 100% found the program interesting (Table 2.7), 100% enjoyed playing the games, 92% would recommend the program to a friend, and 100% reported they would participate in the program again. Additionally, 93% of youth liked the way the program looked, 87% felt the program was designed for youth their age, and 92% reported the program gave them new things to think about. See Table 2.7 for a breakdown of program survey results by all youth and sorted by sex. When asked who the youth thought they would talk to about the information they learned in the program, six youth said their parents (four of which specifically stated their mom), four stated friends, one said other students, and one said a doctor or nurse.

For program surveys, Fisher's Exact Tests indicated statistically significant differences by sex for one variable, "Liked the look of the program". On average, female youth were more likely than male youth to report higher satisfaction with the look of the program ($p=0.044$). The researcher found no other statistically significant differences in program surveys by sex or group, indicating consistent levels of acceptability.

Table 2.7 Program (Overall) Survey Results for Youth by Sex

Question	All Youth		Males		Females	
	Agree n (%)	Disagree n (%)	Agree n (%)	Disagree n (%)	Agree n (%)	Disagree n (%)
Liked the way the program looked	14 (93%)	1 (7%)	5 (83%	1 (17%)	9 (100%)	0 (0%)
Program designed for youth my age	13 (87%)	2 (13%)	4 (67%)	2 (33%)	9 (100%)	0 (0%)
Program was interesting	15 (100%)	0 (0%)	6 (100%)	0 (0%)	9 (100%)	0 (0%)
Enjoyed playing the games	13 (100%)	0 (0%)	4 (100%)	0 (0%)	9 (100%)	0 (0%)
Program gave me new things to think about	12 (92%)	1 (8%)	3 (75%)	1 (25%)	9 (100%)	0 (0%)
Program could help people learn about sexual health	13 (100%)	0 (0%)	4 (100%)	0 (0%)	9 (100%)	0 (0%)
Program could help youth learn how to talk to adults	12 (92%)	1 (8%)	3 (75%)	1 (25%)	9 (100%)	0 (0%)
Program could help people learn how to access health information	12 (92%)	1 (8%)	3 (75%)	1 (25%)	9 (100%)	0 (0%)
Program could help youth learn to communicate better	13 (100%)	0 (0%)	4 (100%)	0 (0%)	9 (100%)	0 (0%)
Program could help youth learn how to make healthy decisions	12 (100%)	0 (0%)	3 (100%)	0 (0%)	9 (100%)	0 (0%)
	Yes n (%)	No n (%)	Yes n (%)	No n (%)	Yes n (%)	No n (%)
Would recommend program to a friend	11 (92%)	1 (8%)	2 (67%)	1 (33%)	9 (100%)	0 (0%)
Would participate in program again	12 (100%)	0 (0%)	3 (100%)	0 (0%)	9 (100%)	0 (0%)
Will use information learned in future	12 (100%)	0 (0%)	3 (100%)	0 (0%)	9 (100%)	0 (0%)

2.3.3. Qualitative Data: Facilitated Discussion with Youth

All five participants of the third implementation session participated in the facilitated discussion at the end of the program. After analyzing the facilitated discussion transcript, researchers identified six themes relevant to the acceptability of the *UTC* program including: 1) program design, 2) program/game structure, 3) learning outcomes, 4) creating connections with trusted adults, 5) complexity of talking about sex/sexual health, and 6) program recommendations. See Table 2.8 for an overview of key themes.

Table 2.8 Overview of Key Themes from Qualitative Data

Key Themes	Summary and Description from Data
Program Design	• Looks like games – fun and educational
Program/Game Structure	• Time to complete varied • Sometimes needed examples • Sometimes needed more facilitation
Learning Outcomes	• Sexual health knowledge • Skill development • Resources
Creating Connections with Trusted Adults	• Building connections takes time; starts with basic trust • Characteristics of adults can make easier/more difficult
Complexity of Talking about Sex/Sexual Health	• Youth don't talk about sexual health • It's hard and uncomfortable to talk about
Program Recommendations	• Want to play with more people • Want to incorporate peer pressure

2.3.3.1. Program Design

Consistent with quantitative results, the facilitated discussion revealed the youth liked the look and design of the program games. Two youth commented on the general appearance of the games being colorful and "very welcoming". More specifically, three youth indicated the program games looked like actual games, and referenced them to a regular board game, Monopoly®, and "like hopscotch, but different". The youth felt the appearance and modality of

this game-based learning program, looked fun and felt like games they were familiar with and enjoy playing.

Another key point to the program design is the games were fun, but provided a means of learning about sexual health content and skills. Two youth commented on the games being educational and informational. According to another youth, the games "…did not look like what it was talking about." This was particularly important in setting the stage for a fun but comfortable learning environment.

2.3.3.2. Program/Game Structure

Moving beyond the look of the program games, comments from the youth gave insight to the structure of the games. Due to the different components and process of each game, the complexity of each game varied. Some games took longer to complete, some needed examples at the beginning, and some needed more help from the facilitator than others.

The time required to complete each game varied for several reasons. First, some games were newer to the user than others, or looked and operated less like a game the youth played before. Second, two games required writing, of which one also required physically moving or walking. One youth stated, "You had to adjust the words a little bit. At least make them the way that fit for you." While this created a challenge for the youth, three commented they liked how interactive it was. Finally, some games involved activities that took additional time and slowed down the progress of the overall game, of which the difficulty level also impacted. For example, one youth indicated the puzzles for the game on communication, *More Than Words*, were difficult.

Due to the difference in structure and familiarity (or similarity) to existing games such as Monopoly®, the youth need different levels of support to complete the games. The youth

specified that seeing an example of game-play at the beginning would be helpful when going through the instructions. This would allow them to have a clear idea of what to do. Also, the youth didn't always need a teacher there to help them complete the games. For the two games the youth were most familiar with, they felt they could do it on their own and call the teacher over for help as needed. However, for the two games that were newer to them, having a teacher was helpful to complete the games.

2.3.3.3. Learning Outcomes

The youth made many comments throughout the facilitated discussion that showed they learned new information and skills by playing the games of the *UTC* program. A few of the overarching comments included, "It will help us in the future", "It helped me learn a lot," "You could benefit from it," and, "It teaches us something new that we didn't know before." Three specific sub-themes of learning outcomes arose which include basic content, skills, and resources.

2.3.3.3.1. Basic Content

In the sub-theme of basic content, data revealed the youth learned about health and health-related information and skills. Specifically, the youth reported learning about the anatomy of their bodies. One stated, "It will teach you more about body parts and how to take care of them." Correspondingly, youth learned the medically correct words for the body parts they didn't already know or use. Regarding learning words and content, the youth also reported learning what different words mean. For example, when referring to the *More Than Words* (communication) game, one youth stated, "It was like reading a script and learning different words. Cause I mean I had heard of those words but I didn't know the definition, really." Thus, they learned basic health terminology, concepts, and the definitions or explanations of those.

2.3.3.3.2. Skills

Two areas of skill-enhancement and/or skill-development arose, specifically regarding communication and decision-making. First, the youth reported learning about how to communicate with people. One youth noted, "About how to communicate with like my peers and adults," and another stated, "And how to tell someone what you are going through." Furthermore, two youth went beyond general communication to applying communication skills and technique. Specifically, one stated they learned how to be respectful when talking to someone, and the other indicated learning how body language and tone can change the meaning of what someone says and even the direction of a conversation.

Second, the youth learned a decision-making model they can use for virtually any scenario. Through this they learned to think about what their options are, what the outcome may be for each option, and who they could talk to if they were in that situation and needed help or advice. One youth stated:

> Like before you respond, if something really bad happens you need to think about like the pros and cons, like we did earlier, what the solution could be, um what might could happen if it's not the right decision you made and different things like that.

This also entailed comparing, "if you might have your worst base or your best case" to weigh the options and reflect on what the best decision would be for themselves.

2.3.3.3.3. Resources

Lastly, the youth reported learning ways to access information about health, which also included people they could talk to. One youth specifically mentioned learning about the StayTeen.org website, and that she would probably use it in the future. Several others also agreed they did not know about it before playing the *Tapped In* game.

2.3.3.4. Creating Connections with Trusted Adults

As a robust theme, Creating Connections with Trusted Adults has several components to it. This theme is best explained in reverse-ordered steps for building connections, then considering the varying preferred characteristics of trusted adults to build connections with.

2.3.3.4.1. Building connections between youth and adults

Data revealed the youth need to have a good connection with an adult before they can trust them. Without this connection, the youth may not be comfortable confiding in an adult. One youth gave the following example:

> It's like, what if it's a parent and a child, they gotta have like a trust or a connection before the child could be like 'I could tell my mom because I know I could trust her, she could help me.' But otherwise if you don't got like a good connection she'll probably be too scared to tell their mom and the problem probably would've got worse or she would've found someone else that she could trust.

Therefore, it is important for youth and adults to build connections, to reach a heightened sense of trust.

When asked how to build those connections, one youth replied, "Talk to them, tell them how you feel, and maybe they could start to understand and you can trust them." While the way to start building those connections is through conversations, those early conversations often need to start with small, low-stakes, low-stress topics before gradually building up to conversations requiring an increased trust between both the youth and adult. Consensus among the youth showed that talking to adults feels intimidating to youth. When asked why talking to adults feels intimidating, one youth replied:

> Just talking to like older – well not older people exactly but like adults. Because sometimes they could overreact if you did something or like something happened. Or somebody ask you something and they're like "Oh?! Why are you talking to them??" Or this and that.

Thus, the youth need to know or feel like the adult will listen and have a dynamic conversation with them rather than jumping to conclusions or shutting them down.

2.3.3.4.2. Characteristics of trusted adults

When thinking about adults that youth would want to create these connections with, there are varying preferences among the youth regarding relationship, age and experience, gender, and situation. Early on, one youth began by stating, "Well to be honest, most people don't feel comfortable talking to their parents about this stuff." Others nodded in agreement, though no one provided reasons or justifications as to why.

Some youth stated they prefer talking to younger adults, for example, "So having another adult maybe younger like 20s or like 18-16 would be better." While one youth shook her head in agreement, another youth shook her head no and stated she would rather them be older, "Yeah cause they could've been through it… because like they [younger adult] could have just gone through it and not really know much about it since they're not that much older than you." One youth followed up by saying, "I would like someone who relates to me and can relate to what you're going through." Therefore, the level of trust for conversations about sexual health and risky behaviors may vary by relationship and/or relatability for youth and trusted adults.

Regarding sex and gender, the youth did not state any specific preferences. However, when asked, the youth said they may prefer someone of a particular sex or gender depending on the situation. The youth also stated that who you talk to, regardless of characteristics, may vary by situation, circumstances, or more importantly, "How much you trust in somebody."

2.3.3.5. Complexity of Talking About Sex

This theme, Talking About Sex, is one that is quite complex and difficult to separate into mutually exclusive components or sub-themes. Communicating about sexual health, at all, is rare

and entails different cultural factors. Simply put, the youth said, 1) they don't talk about sexual health, and 2) it is hard and uncomfortable to talk about sexual health.

Regardless of who they are talking to, the youth were clear they do not talk about sexual health. One youth blatantly said, "Oh I don't talk about it at all," followed by another youth who agreed, "I don't either." Specific reasons for not talking about it were not disclosed, it was apparent that culturally they just do not talk about it. Another youth stated, "cause like not everybody gets into the subject like that. So like it probably could get uncomfortable for them."

When sexual health does come up, the youth said it is hard and/or uncomfortable for them to talk about it. During this discussion, all youth talked about the use of medically correct words, such as penis and vagina as being hard and/or uncomfortable to say. Referring to the challenge of saying the words, one youth said, "Yeah pronouncing it was kind of hard." When asked what was uncomfortable about saying the medically correct words, one youth stated, "I don't know just saying it cause like if we are talking about it with our friends or something we will say like the slang word," making them less familiar comfortable with the medical terms. Albeit hard or uncomfortable to say sometimes, two youth enjoyed learning the correct words for the body parts. Furthermore, there was disagreement among youth whether you should use the medically correct words if/when talking about sexual health; while some thought you should use the correct words, others did not.

2.3.3.6. Program Recommendations

Two key recommendations arose from youth responses around program participants and desired topics. First, the youth stated the games would be better with more participants. Due to the structure of the games, the youth felt their experience would be even better with more people,

to hear different perspectives. Along with suggested group size, the youth also recommended that youth of all genders participate. One youth stated:

> Because like, they don't know about girls and we don't know about boys so I think it could be good for us both to learn about it. Like especially if they are like in middle school or our age because we don't really know all of that.

Though the youth recommended this program for all genders, they did not comment on any potential discomfort that may arise when playing with mixed-gender groups.

Secondly, the youth commented on one additional topic they would like to see incorporated in future content: peer pressure. After one youth suggested adding content on peer pressure, another youth agreed and said, "Maybe mentally, like how they like take a toll on you or impact you." Peer pressure is a topic that many youth may already be experiencing or anticipating, as one stated (when referring to a scenario used during the *Stop • Think • Act* game), "When they asked the girl to send pictures. Peer pressure about that cause she probably like – um she probably feels pressured because they probably kept asking and asking." Not only did the youth request peer pressure content, they also see the importance of incorporating how it can affect youth.

2.4. Discussion

Overall, the participating youth in Tarboro, NC enjoyed the *UTC* program and felt like they learned beneficial information and/or skills through playing the games. Not only would most participants recommend the program to friends, all reported they would participate in the program again themselves and use the information they learned in the future, demonstrating successful use of GBL (Garris et al., 2002).

Utilizing mixed methods allowed for triangulation of findings between qualitative and quantitative data to support a representation of the participants' lived experiences with *UTC* (Creswell & Plano Clark, 2018; Creswell, 2013). Qualitative data triangulated quantitative

findings that youth liked the program design; felt the games and content were relatable to them; and learned knowledge and skills around adolescent development, accessing credible information, communicating about health, and making healthy decisions through playing each of the games. Survey responses and discussion about each game were mostly positive. As expected, some youth liked certain games more than others. This variability was expected as youth do not always like the same games or activities, and may prefer learning about different content areas over others (Greene et al., 2013; Haruna et al., 2018). Nonetheless, *The Sum of The Parts* appeared to be the most highly favored game as survey responses showed 94% of youth said they would play it again, and two youth said in the facilitated discussion they would play it an infinite number of times. Those that would play *The Sum of The Parts* only one or two times were less comfortable with this game because of the large focus on sexual health, specifically anatomy. Surveys revealed only 62% of youth would play *Stop • Think • Act* again, which the facilitated discussion revealed may be due to the complexity of the game.

Qualitative data also triangulated findings from quantitative data regarding what youth learned. Though fewer youth claimed they would play *More Than Words* and *Stop • Think • Act* again, in the facilitated discussion the youth talked more about these two games than the other two. Youth reported learning how to communicate through the *More Than Words* game, which qualitative data supported as several youth commented on learning not just how to communicate, but how to use communication skills such as respect and body language. Similarly, youth mentioned learning to think through what might happen if they make a certain decision for a given scenario in *Stop • Think • Act*, supporting the 87% of youth that agreed they learned how to think through different options before making a decision.

It is important to note that although the participants' survey responses and comments in the facilitated discussion indicate acceptability and support of this GBL program, not all youth are comfortable with the content of all games. Because of the varying levels of comfort with sexual health, the design and look of the games was important to create a positive exposure and learning experience for the youth. Not talking about sexual health creates a cultural barrier to decreasing some participants' comfort with the topic and contents. Therefore, it is important the program and content be introduced to the youth and facilitated based on their comfort and needs (Aparicio et al., 2018). Youth who are less comfortable with sexual health indicated they would not want to "jump right in" to talking about sexual health and the human body. In such cases, facilitators should use an icebreaker activity to increase comfort, and/or consider not starting with *The Sum of The Parts*. While no youth talked about the facilitators specifically, due to the complexity and discomfort of talking about sexual health, the facilitators should work to build connections and trust with the participants (Meltzer et al., 2016, 2018). As youth indicated, if they do not trust someone enough they will not talk about sexual health with them; and they cannot have trust without a basic connection that starts with small conversations to connect and relate to one another. Therefore, participants' experience with the program may be impacted by their relationship with, or perception of, the facilitator and whether or not they can trust them or relate to them.

Youth indicated different levels of comfort and trust with various adults for conversations around sexual health, consistent with existing literature (Grossman et al., 2018; Meltzer et al., 2016, 2018). Some youth may prefer younger adults, while others may prefer to talk to adults with more experience and/or adults that are more relatable to them. Regardless of the characteristics, the one factor that remained constant in identifying an adult to talk to was level

of trust, building on existing literature of trusted adults (Bellis et al., 2017; Pringle et al., 2018; Meltzer et al., 2018). Therefore, it is important that adults start with low-intensity conversations to build connections that can lead to trusting relationships.

Though comfort levels varied in the topic of sexual health as a whole, youth reported learning information through *UTC* that would benefit them in the future. Based on the quantitative and qualitative findings, the researchers conclude *UTC* to be highly acceptable to youth as a sexuality education program.

2.4.1. Limitations

The results and conclusions of this study must be considered within the context of the study's limitations. First, the data came from a small sample size, representing a limited demographic. The small sample size limited the researchers' ability to conduct advanced statistical methods on quantitative data to determine significant relationships and differences among variables. Second, researchers only analyzed the facilitated discussion for time point three due to program revisions. While the revisions occurred to improve the program using youth feedback from sessions one and two, it limited the sample for the qualitative data. Additionally, the youth only participated in the program one time, limiting the amount of content they were exposed to within each game, which may impact participant responses. Lastly, due to logistical issues, the youth did not participate in the take-home activity prior to playing the facilitated games, eliminating the researchers' ability to collect data on that activity. Lacking this component may also affect youth responses on the program surveys and facilitated discussions, though feedback and comments regarding the program's potential impact on talking to trusted adults was still positive.

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3. ASSESSING THE IMPLEMENTATION OF AN INNOVATIVE TEEN PREGNANCY PREVENTION PROGRAM IN A COMMUNITY-BASED ORGANIZATION

3.1. Introduction

In the past few decades, the number of sexuality education programs with research demonstrating significant effects has increased (Kirby, 2007) with over 40 evidence-based programs (EBPs) currently supported by the federal government (US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2017b). Besides EBPs, efforts to create new and innovative programs are underway to reach additional, under-served communities (US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2016, 2017b, 2017a; Wilson et al., 2017, 2018). The development of new programs is intended to reduce teen and unintended pregnancy among populations experiencing significantly higher rates that existing programs are not affecting (Wilson et al., 2018).

Upon developing new programs, feasibility studies allow developers and researchers to identify a program's potential for sustainability and readiness for further testing to assess efficacy and, eventually, effectiveness (Arain et al., 2010; Bowen et al., 2009). Researchers focused on intervention feasibility suggest eight aspects of feasibility: acceptability, demand, implementation, practicality, adaptation, integration, expansion, and limited-efficacy testing (Bowen et al., 2009). Health education and promotion literature entails program feasibility studies (Allen et al., 2013; Anderson et al., 2017; Chen et al., 2018; Dowshen et al., 2015; Mustanski et al., 2015; O'Malley et al., 2017); however, few studies focus specifically on the implementation process (Chen et al., 2018).

3.1.1. Assessing Program Implementation

Among the eight aspects of feasibility, implementation is important from an organizational standpoint (Demby et al., 2014; Kelsey & Layzer, 2014; Tomioka & Braun, 2013). Community organizations are pressed for time, have limited resources, and are under constant pressure to increase their reach and create change in their community. Therefore, the implementation process can affect an organization's willingness and ability to implement a program without a thorough understanding of the process (Burau et al., 2018).

As efforts to create new programs continue, the understanding of program implementation in real-world settings becomes critical to delineate the program's fit within the implementation setting or site, the sites' resources and needs, and success or failure of program execution (Bowen et al., 2009; Demby et al., 2014; Mihalic et al., 2004; Orsmond & Cohn, 2015). This will ultimately allow developers to understand the extent to which a new program is delivered in a real world context, which can then contribute to program iterations, sustainability, and transferability of a program (Bowen et al., 2009; Sarma et al., 2020). This is important in identifying compatible partners for future implementation based on organizational fit (Demby et al., 2014; Tomioka & Braun, 2013).

Program development is a complex process. As professionals develop new programs to reach marginalized communities, there is much to consider including the target population, modes of instruction or service, implementation setting and site(s), program facilitators, content and cultural relevancy, among many others. However, beyond the components comprising a program is a key intrinsic factor: implementation. A program itself is not enough; organizations must implement programs with consistent quality to effect behavior change (Mihalic et al., 2004). However, implementation quality is an intricate issue as many factors contribute to

program implementation that can affect its outcomes (Bach-Mortensen et al., 2018). Examples of such factors include, but are not limited to: administration and organization, funding and organizational resources, community networks and linkages, program adaptations and community fit, staff preparedness, and facilitation instructions and guidelines (Bach-Mortensen et al., 2018; Demby et al., 2014; Kelsey & Layzer, 2014; Mihalic et al., 2004; Sarma et al., 2020; Shearer et al., 2005; Shemesh, 2018; Tomioka & Braun, 2013).

Understanding program implementation is a critical aspect of program feasibility and preparing new programs to move past the developmental stages (Bowen et al., 2009; Orsmond & Cohn, 2015). Critical analysis of the implementation process early on allows developers to re-iterate program components as needed to better suit intended implementation sites and adjust program guidelines around logistical encounters (Allen et al., 2013; Anderson et al., 2017; Dowshen et al., 2015; Levesque et al., 2017), and identify solutions and strategies for planning future implementation (Demby et al., 2014; Kelsey & Layzer, 2014; Tomioka & Braun, 2013). Because of this, it is important that developers study implementation in a real-world context, rather than optimal settings to produce meaningful and applicable results (Bowen et al., 2009; Glasgow et al., 2012). Such understanding will contribute to future implementation, institutionalization, and replication in additional communities.

3.1.2. Program Background

Between 2018-2019, a group of stakeholders in a rural town of North Carolina used human-centered design strategies to develop an innovative program for the youth in their community titled *Using The Connect* (*UTC*). *UTC* is a set of educational games focused on sexual health content and skills to reduce teen and unintended pregnancies in rural communities. The program contains one take-home activity for youth to complete on their own, and four

games for youth to play in a facilitated environment; details of program activities are described in Appendix C. *UTC* fidelity requires organizations implement the games with youth in grades 6-8, in groups of four to six participants at each game; allowing for a total group size of up to 24 youth. Facilitators should plan for youth to play the games for 20 to 30 minutes at a time; multiple games can be played consecutively during implementation sessions if desired.

3.1.2.1. Organizational Structure

To assess *UTC* implementation, researchers at Texas A&M University partnered with staff at Michael's Angels Girls Club, Inc (MAGC) in Tarboro, NC to assess implementation. MAGC is a small community-based organization (CBO) serving girls, grades K-12, in the Tarboro community. Based on the program design, MAGC leadership felt confident in meeting implementation requirements, which entailed:

- Time to host four-hour sessions, three times
- Facility space to implement the program, including tables and chairs
- Staff to facilitate program games
- Ability to recruit youth participants – minimum of four per session

3.1.3. Program Implementation

Beginning January 2019, MAGC staff began implementing *UTC* for formal feasibility testing. The MAGC staff recruited community members to assist with facilitation and youth to participate in the program for feedback on the final design. They implemented *UTC* three times between the months of January and March 2019. All sessions occurred, in-person, on Saturdays from 10am to 2pm at the MAGC facility. Each session comprised an original group of youth; the youth played each game for 20-30 minutes. Facilitators implemented all four games of *UTC*, following program protocol for all games. The section below describes the study design used to assess the implementation process.

3.2. Methods

The purpose of this study is to understand the implementation of *UTC* in a CBO setting under real-world constraints. Feasibility researchers suggest implementation focus on execution (including success or failure) and resources needed to manage and implement the intervention (Bowen et al., 2009; Orsmond & Cohn, 2015). The sections below describe the research design.

3.2.1. Study Design

Using mixed methods in a single case study design, the researcher collected both qualitative and quantitative data for each implementation time point. For this study, the researchers analyzed two sources of data (facilitator interviews and observation notes) for the second and third implementation sessions. The interviews and observation notes provided detailed accounts of the implementation process. Through a constructivist approach, the researcher aimed to reveal the varying perspectives and experiences of the program facilitators (Lincoln et al., 2018; Lincoln & Guba, 1985; Mertens, 2019). The research team excluded data from time point one for this analysis as program developers modified program activities after time point one. Therefore, the experiences with time point one may not align with the final program design. This study was approved by the Texas A&M University Institutional Review Board prior to data collection.

3.2.1.1. Participants

This study entailed a convenience sample of facilitators implementing *UTC*, and youth attending MAGC for scheduled program activities. The researcher recruited the participants (youth and facilitators) already attending MAGC to facilitate and participate in *UTC* to partake in the study.

The second implementation session comprised three youths, and the third session comprised five youth. All youths identified as Black and were between the ages of 11-14. In the second session, two youths identified as male and one identified as female; while all five youths in the third session identified as female. Upon arrival, the researcher approached all youth (and their parent/guardian) in-person to inform them about the research study taking place, as they would naturally be observed. All youth provided personal assent and parental consent to be part of the observations.

Four facilitators (given pseudo-names) implemented the *UTC* program over the three sessions, including two MAGC staff (Kandice and Ashley), one health educator from the Edgecombe County Health Department (John), and one young adult who was a former participant of MAGC (Jaleesa). Table 3.1 provides demographic information for the facilitators.

Table 3.1 Facilitator Characteristics

					Sessions		
Facilitator	**Age**	**Gender**	**Race**	**Current Role**	**1**	**2**	**3**
Kandice	44	F	Black	MAGC Staff	X	X	X
Ashley	39	F	Black	MAGC Staff	X	X	X
John	24	M	White	Health Educator (County Health Dept.)		X	
Jaleesa	18	F	Black	Former MAGC Participant			X

Prior to implementing *UTC*, the researcher approached all facilitators in-person about the study. The researcher informed the facilitators about the research study and asked them to participate in the study, including observations of implementation and interviews to reflect on their experience. All facilitators agreed to participate; however, at the time of the interviews the researcher could not reach one facilitator as she had moved and could not be reached, therefore leaving a sample size of three facilitators (n=3) for the interviews in this study, and four (n=4) for the observations. It is worth noting the two MAGC staff assisted in facilitation for all three time points. As all facilitator interviews occurred after completing the third round of

implementation, the MAGC staff provided insight on their experience for all three implementation sessions.

3.2.1.2. Data Collection

As this study focuses on implementing *UTC* in a CBO setting, the researchers analyzed observations and facilitated discussions in this article. To ensure comfort and confidentiality, only participating youth, facilitators, MAGC staff (if not the facilitators) and the researcher were present during program implementation.

3.2.1.2.1. Observations

The researcher observed each implementation session at the MAGC facility and took detailed observation notes using an observation note-taking template derived from the Template for Intervention Description and Replication (TIDIeR) (Hoffmann et al., 2014). The observation guide containing prompts related to the TIDIeR constructs ensured the researcher included notes about all aspects of program implementation including but not limited to: materials, procedures, people, processes and delivery modes, setting and location, frequency and/or dosage, tailoring, and modifications (Hoffmann et al., 2014).

Following each implementation session, the researcher discussed the observation notes with MAGC staff. During this debrief, the observer first asked the MAGC staff if there were particular things they observed during the program that stood out to them, and added those comments to their field notes in a separate color. The researcher then went over key observations noted for each game, and the program overall with the MAGC staff. Similar to "member-checking" this allowed the staff to confirm, revise, or contextualize observation notes based on their perspectives as only one person observed implementation (Houghton et al., 2013). At the

end of each session, the researcher used the field notes to construct a thick description of everything observed (Lincoln & Guba, 1985).

3.2.1.2.2. Facilitator Interviews

All facilitator interviews occurred one-on-one with the researcher over the phone and lasted approximately 30 minutes. Prior to the study, the researcher created a facilitator interview guide based on principles from the Consolidated Framework for Implementation Research (CFIR) (Damschroder et al., 2009), and the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) framework (Glasgow et al., 1999). The researchers did not include all constructs from the CFIR and RE-AIM frameworks in this study, as the primary focus was the implementation process. See Table 3.2 for an overview of the interview questions and the underlying framework principle or construct.

The researcher offered to send the questions to the facilitators ahead of time for review, but none felt it was necessary. As permitted by facilitators, the researcher audio recorded interviews and transcribed them verbatim for analysis. During the phone interviews the researcher took field notes, though nothing altered the final transcripts. The researchers offered facilitators to review final transcripts, but none desired to.

Table 3.2 Facilitator Interview Questions

Construct	Questions
CFIR (Process)	Tell me about your experience with this program as a facilitator?
RE-AIM (Implementation)	Share with me some barriers of this program or implementing it?
CFIR (Intervention Characteristics) **RE-AIM** (Implementation)	What made it easy to implement this program?
CFIR (Process)	Tell me about what you felt your role was at each station as the facilitator?
	Tell me how you think this program could be improved?
CFIR (Outer Setting & Inner Setting)	What resources did or would you need to facilitate this program?
CFIR (Characteristics of Individuals) **RE-AIM** (Efficacy)	Share with me how you think this program affects the participants?
CFIR (Inner Setting)	Tell me your thoughts on the ideal place/setting for implementing this program?
CFIR (Process)	What do you think is the ideal way to implement this program? (Think about number of facilitators, participants, etc.)
RE-AIM (Reach)	What are your thoughts on recruiting 6 – 8 grade youth for this program?

3.2.1.3. Data Analysis

The researcher recruited two additional graduate students, with prior training and experience in qualitative data collection and analysis, to help analyze data. The team of three coders allowed for increased the reliability of findings (Lincoln & Guba, 1985).

The lead researcher provided the team with a list of potential codes and themes, but instructed them to use it in combination with open-coding for all qualitative data. Qualitative methodologists support the use of preexisting codes with open-coding to reach a deeper understanding of the data and prevent a limited scope of results data (Glaser & Strauss, 1967; Richards & Hemphill, 2018; Yin, 2014). The researcher established the list of potential codes from CFIR, TIDIeR, and RE-AIM constructs (Damschroder et al., 2009; Glasgow et al., 1999;

Hoffmann et al., 2014). Throughout the review process, all researchers kept note of codes derived from the data, and updated the codebook throughout. After coding observation notes and interview transcripts for time points two and three, the researchers met to discuss final codes and derive themes based on the codes, ending with an inter-rater reliability coefficient of 0.94.

3.3. Results

The qualitative data analysis revealed many important insights which provided a nearly comprehensive understanding of the implementation process for *UTC* in a community-based setting. Several of the themes related to implementation topics recommended by researchers, such as degree of execution and resources to manage and implement the program (Bowen et al., 2009; Orsmond & Cohn, 2015). However, the use of open-coding allowed researchers to unveil additional themes related to program implementation.

3.3.1. Program Structure

Several sub-themes arose including: 1) Game structure and facilitation needs, 2) Program flexibility and adaptability, 3) Program participants, 4) Engagement, and 5) Program materials. The sections below describe the aforementioned sub-themes.

3.3.1.1. Game Structure and Facilitation Needs

Triangulated data from observation notes and interview transcripts indicated facilitation needs varied for each game based on the structure of the game. Those that were less like existing games the youth were familiar with required more hands-on facilitation; specifically *More Than Words* and *Stop • Think • Act*. One observation note stated, “Once the facilitator walked the youth through one round of the game, it seemed to click and they needed less guidance.” Sometimes the youth would look to the facilitators for confirmation that they were supposed to actually complete some of the activities within the games. Meanwhile, some games needed less

hands-on facilitation for going through each step of the game; though the facilitators would interject throughout to have the youth reflect on their answers.

3.3.1.2. Program Flexibility and Adaptability

Regarding implementation, *UTC* offers flexibility in several ways. First, the facilitators can start with any of the four games. At each implementation session, the youth played the games in different orders, without raising confusion among the youth or facilitators. Second, the facilitators can dictate which content is discussed or used during the games by reordering the decks of game cards. Facilitators may do this to begin with more introductory level content, or content seen as more relevant to the youth (such as "hot topics"). Third, the facilitators do not have to read word-for-word from the facilitator manual and can use their own language to fit the context of the group. This is important as the facilitator may wish to use more youth-friendly language, or language that is more culturally relevant, so long as they are using the medically accurate terminology associated with content. Last, the facilitators can engage with the youth throughout the games to tie in current events or hot topics relevant to the community and content.

The structure of the games also leans to adaptability as needed. The materials allow for adaptability, or even replacement, as needed if lost or ruined. For the second implementation session, the posters used for the *Stop • Think • Act* game board had been damaged. However, the facilitators reconstructed a similar layout of the game board using wrapping paper and printing a few graphics.

There are also ways to adapt use of some program materials if the facilitator sees a more meaningful way to use them, without changing the structure of the game. For example, in *The*

Sum of The Parts, the youth get a small PlusPlus building piece[3] when they answer questions correctly. While the PlusPlus pieces are intended to be used for building a structure in the middle of the table as a group, the youth may build their own structure in front of them. An observation note stated:

> They also kept the pieces in front of them and "built" their own structure. No one corrected them to build something together, they seemed to like doing what they wanted with the pieces, and maybe it was a way to personalize it for them.

This did not change the structure of the game, but allowed the youth to work independently for a change.

Two games (*Tapped In* and *Stop • Think • Act*) incorporate local specific people, place, and providers into the content and activities within the games, personalizing it to the community. This allows organizations and facilitators to make the program more relevant to the youth. Because of time constraints and limited staff with busy schedules, the MAGC staff did not update game contents to include local people, places, and providers. For *Tapped In*, only a few game cards address community-specific information; not affecting game delivery. However, *Stop • Think • Act* requires having contact cards (similar to business cards) for local people, places, and providers that the youth discuss and keep for future reference. Because the MAGC staff did not have the contact cards, the facilitators verbally told the youth examples of people, places, and providers within the community.

3.3.1.3. Program Participants

The structure of the program and its associated games allows for various group sizes. There is a minimum number of participants needed for each game (n=4), allowing for

[3] PlusPlus building pieces are similar to building blocks. Each one looks like to plus signs attached to each other (++). This single shape creates endless building opportunities as each one can easily connect to the others in various ways.

organizations to implement the games even when attendance is low. However, the facilitator needs to have a plan in place if there are not enough, or too many participants. The program comes packaged with one set of all four games; each game is designed for groups of 4-6 therefore one program set can accommodate between 4 and 24 youth. During one implementation session, there were only three participants. For most games, this was not an issue; but it became a logistical issue for *Stop • Think • Act*, as the instructions are written for a minimum of four participants. During the second session, the facilitator asked her daughter (who had been in the other room) to participate in this game. Her daughter was nine years old, but the age difference did not affect her ability to follow the instructions and contribute to the game. In other cases, when there is not an "extra youth" nearby, facilitators may consider skipping the game during that implementation session, or playing the game themselves with the youth.

3.3.1.4. Engagement

Participant engagement varied slightly throughout the games. Like most games, there were highs and lows for engagement levels. As with games, each person had to wait their turn, leading to natural down time. As noted in the observation write-ups, "The moments of being disengaged were most prominent when the other kids were writing their answers or thinking about their answers."

3.3.1.5. Program Materials

The program materials appeared to be user-friendly for the instructor and the youth participants. Anytime the youth had to write something, they did so using dry erase boards and markers, which allowed for quick fixes when they made an error. Having the answers on the game cards allowed youth to receive real-time feedback to their responses from another peer.

This also allowed their peers to tell them the answer and learn from each other, rather than a facilitator telling them. Regarding this one facilitator stated:

> …and you know the best way to learn is through your friends. So, you know if your friends say one thing, then you're going to be more likely to believe them, so if it's going to be like a factual thing like through the game then that'll be helpful.

Each game included supplemental materials to provide additional information touch-points for the youth. Sometimes the youth sought these out because of curiosity, other times to find the answer to a question. Nonetheless, the materials appeared to help youth participate in the games with ease and not be a setback to game play and progress.

One game, *Tapped In*, contained challenges for the youth to complete; most of which required a smart phone and internet access. Not all youth had smart phones, and sometimes the internet was slow, creating barriers to completing those challenges. Several of the challenges could be completed using a book with supplemental information, but not all technology-based challenges could. When the youth could not complete a technology-based challenge, they drew and completed a new challenge card.

3.3.2. Facilitators

As with most programs, the facilitators of *UTC* played an integral part in program implementation. Two to three facilitators were present and engaging with the youth at all times. Observation notes and interview transcripts contained rich data allowing the researchers to understand and analyze how the facilitator contributes to implementation in various ways. The sub-themes regarding facilitators, described below, entail 1) facilitator role; 2) facilitator background, and 3) facilitator/program manual.

3.3.2.1. Facilitator Role

The researchers detected consensus among all interviews regarding the facilitators' perception of their role during *UTC* implementation: to oversee, provide instructions and

guidance, give examples as needed, and answer questions. One facilitator stated:

> So, my role as the facilitator at the stations was, um, basically to oversee the activity. Uh, make sure that the students understood what was going on, what was expected, um also to clear up any miscommunication or misunderstandings of what the instructions were and to help out any time that I was able to – you know if they had a question or whatever it may be… the facilitator was basically there as a guide, I felt like.

Observations notes triangulated these perceptions as the researcher observed facilitators primarily going over the instructions of games, walking the youth through an example round of games, clearing up misunderstandings, helping youth pronounce words, and watching to make sure the youth were on task.

However, observation notes denoted an additional and important role of the facilitators: having the youth reflect on their answers and the content. For example, when a youth would answer the question on a game card such as, "Name one adult at your school you trust and could talk to if you were having a hard time," the facilitator would have the youth say why they trust that person. For questions in *The Sum of The Parts*, focusing on basic content of the mind and body, the facilitators would have youth reflect on why it's important to know the information and how it can benefit them. Observation notes indicated this role, along with the others, took place during all games.

3.3.2.2. Facilitator Background

As the facilitators expressed, they primarily guided the youth through the activities, but did not do any formal teaching. Because of this role, all felt that future facilitators did not need past experience with sexual health, and did not need a formal training to implement the program. All three facilitators specified what would be helpful and ideal is past interaction or experience working with youth. One facilitator also felt that having patience was important and stated,

> I think working with youth would be very important because, well, you have to sort of understand where they are coming from; they don't know all of this information. Um and they are not going to be obviously as adult about it as an adult is going to be so, just

> knowing that and being patient is going to be key. And if you do have past experience teaching sexual health that would be great, um, but obviously it's not going to be a requirement.

It is important facilitators understand that youth come from unique backgrounds, have varying levels of knowledge, and may ask a variety of questions regarding sexual health.

3.3.2.3. Facilitator/Program Manual

The facilitators all stated the one thing they needed to implement *UTC* was the program manual. According to all facilitators, the program manual, "explained and laid everything out," and was very user-friendly. John stated, "It told you what you needed, what you had to do, um, kind of how it should be progressing throughout." Excerpts from observation notes also supported the importance of the manual, "He seemed comfortable just taking the manual and jumping in." While facilitators do not need formal training to implement *UTC*, the program manual allows facilitators to pick-up and go.

Overall, the facilitator guided program implementation with the youth. Unlike many EBPs, their role did not require extensive background or training in sexual health to be successful, though it required a facilitation manual. As a primary part of their role involves interacting with youth, the facilitators' demeanor and/or characteristics can them understand and connect with the youth. The facilitators and their organization need to plan for implementation so they are prepared to fulfill their role.

3.3.3. Group Dynamics

The theme Group Dynamics entails several important insights to understanding *UTC* implementation. The facilitators all commented on the importance of the youth being comfortable with each other. One stated, "…if the youth are uncomfortable around each other, that could be a barrier." This is important as their comfort can influence their level of interaction with each other. Given the structure of the games, interaction is inevitable and facilitators wanted

the youth to be comfortable so they would open up and share. Two facilitators recommended using icebreakers for groups that do not know each other. Observation notes supported this and described youth talking and laughing with each other during icebreakers, allowing them to make an initial connection. The facilitator's background and understanding of the community and youth can aid them in positively influencing the group dynamics as needed.

3.3.4. Recruitment

Recruiting youth is essential to program implementation because without the minimum number of youth organizations cannot implement *UTC* as designed. Facilitators revealed unique perspectives on recruiting youth participants for *UTC*, unveiling associated enabling and restricting factors. One facilitator felt recruiting middle school youth is difficult because of competing priorities. However, two facilitators emphasized the importance of incentives to recruit youth. Another facilitator stressed not only the importance of time and location, but drawing on the program structure to helping with recruitment, stating, "Anytime they like a game or activity or something like that you're going to get a little bit more interest than if it's 'oh we're going to be doing a presentation on sexual health.'" One facilitator also felt the facilitators' age and relatability could help with recruitment, specifying youth would be more likely to come if they know they can relate to, and be comfortable around, the facilitators.

Observation notes portrayed important aspects of recruitment for program implementation within MAGC. The organization appeared to be well-connected with people and organizations in the community, and very in-tune to the community's culture. Before implementation sessions began, the MAGC staff would call or text a handful of people as last-minute reminders and invitations to the program. They would even walk down to the barbershop and beauty salon to invite other youth waiting for appointments. For the last session, one of the

MAGC staff went to pick up a few youths that did not have transportation to get there. It was obvious the organization had earned their community's trust; and that combined with their connections and ability to provide transportation contributed to their recruitment abilities.

3.3.5. Nesting Program

The facilitators recommended embedding *UTC* in larger programs, specifically places the youth regularly attend. All facilitators recommended schools and after-school programs. They felt by implementing *UTC* where youth are accustomed to going would reduce recruitment difficulties and help with comfort as they would already have a relationship with the people there. One specifically mentioned The Boys and Girls Club stating, "I think somewhere that has a large capacity on a regular basis like a Boys and Girls Club, maybe. Because usually the kids that are there, are there every day and they know each other pretty well." This facilitator also believed nesting it into another program could help normalize it as a regular activity within an organization or program; she stated:

> As far as in school, during something like health week, they're already geared to 'okay, this is what we're going to learn about' and kind of, there's a, I guess like an icebreaker into the game itself because you already know 'this is what we're looking at this week for this particular reason'.

Thus, nesting the program in an organization or a larger program could positively affect implementation as the youth would be more comfortable with each other and potentially see the program as a normal activity they engage in.

3.3.6. Time

The concept of time arose in several ways regarding *UTC* implementation. First, the time spent playing the games. The youth spent approximately 20 to 30 minutes playing each game. While this was sufficient to get through at least one round of each game, if not two, it was not enough to go through all content of the program. Second, observation notes revealed some games

(or activities within games) took more time to complete than others. This is important for considering implementation structure – what games to implement when based on logistics and time. Last, based on these observations regarding time, it is unlikely they would implement *UTC* for only one day.

It is also obvious that the and facilitators need time to prepare for implementation. This includes reviewing program materials, updating contents to include community-specific information (particularly in the *Tapped In* and *Stop • Think • Act* games), planning for recruitment and implementation, recruiting youth participants, and implementing the program.

3.3.7. Environment

The last theme, environment, comprises the physical setting of implementing the program, and the social environment or climate. To implement the program, organizations need an adequate space or setting. The MAGC facility provided the physical space needed; the facilitators set up each game on its own table (or in its own area), all spread out across the room.

However, the physical space itself is not all that matters. Facilitators stressed the importance of the overall environment surrounding that space. Specifically, they specified the space needed to be conducive to learning (i.e., not loud or distracting), and somewhere the youth feel safe and comfortable. One facilitator went a step further to emphasize the importance of having the right people in the room because the people would also affect the climate and the youth's comfort.

One facilitator felt the structure of an environment, or lack of, would affect implementation. The structure within an environment would affect the behavioral expectations of the youth, and their facilitation needs. She used a school as an example eluding that with a more structured environment the youth know what teachers expect from them regarding their behavior,

and will therefore be more likely to stay on task and need less direction and facilitation. Thus, *UTC* could be implemented with larger groups of youth at one time without requiring multiple facilitators.

3.4. Discussion

When focusing on the implementation of an intervention or study, researchers emphasize the degree of execution and its success or failure, resources needed, and ability to manage and implement said intervention or study (Bowen et al., 2009; Orsmond & Cohn, 2015). Overall, MAGC and the facilitators successfully implemented the *UTC* program games in the community-based setting. However, MAGC was unsuccessful in distributing the take-home activity given they initially planned to distribute it before game play. While they distributed it afterwards, they could not tie it into the games during the implementation sessions. This provides an important insight for planning future program implementation. Due to the flexibility to the program structure, organizations may opt to distribute the take-home activity in various ways that work best for them. For instance, organizations may distribute it during advanced registration, or wait and distribute to all participants at one time. By waiting to distribute the take-home activity during the first session, they can demonstrate how to complete the activity and have the youth practice with each other to build their self-efficacy.

From an organizational perspective, MAGC appeared to have the administrative and management capacity needed to plan and execute *UTC* implementation, crucial to organizational success and demonstrating the necessary administrative capacity (Demby et al., 2014; Kelsey & Layzer, 2014; Mihalic et al., 2004; Tomioka & Braun, 2013). The organization provided an adequate setting, time, and facilitators; and the facilitators adhered to the implementation structure and design of program games. All resources and materials needed were provided in the

program and game boxes for implementation; requiring minimal input from the organization. While MAGC staff did not update game contents to include community-specific people, places, and providers they verbally incorporated local resources to the youth. However, it is important to note without their ties and connections to the community, this may not have been possible. Future implementation efforts in any organization should prioritize adequate time for planning and updating community-specific content early on (Kelsey & Layzer, 2014); that way facilitators do not have to come up with community resources on the spot.

Integral to implementing a program, MAGC successfully recruited program participants from the community, except for one time. Not all youth recruits showed up for the program, a common challenge for community-based programming (Akiva & Horner, 2016; Anderson-Butcher, 2005; Greene et al., 2013). However, MAGC offered a unique service in providing transportation for youth participants in need, that other organizations may not have the same resources and infrastructure to provide (Demby et al., 2014; Shearer et al., 2005). The results also show ways the organization can capitalize on the facilitators, program structure, and potential incentives to help with recruitment, if not nest it into regular programs and services, or partner with other organizations to embed the program in regular services.

Not only did they recruit youth participants, MAGC also recruited community members to help facilitate the program to gain further insight on facilitator needs. The facilitators' success in implementing *UTC* supports the potential use of this program by organizations with limited staff. As facilitators do not need formal training to implement the program, small organizations can consider using part-time staff, interns, young adults and older teens, and volunteers to help facilitate. However, a potential drawback to this is facilitators not employed full-time by the organization may lead to frequent turnover (Mihalic et al., 2004; Shearer et al., 2005).

Regardless of the facilitators role in the organization, they can affect successful program implementation. As described in the data, the facilitators may contribute to participant recruitment, influence group dynamics, and help provide a comfortable learning environment for the youth. This is important as sexual health is already labeled as an uncomfortable topic for the youth (Grossman et al., 2018).

As described in the results, the structure of *UTC* lends the program to variability that can be used to an organization's advantage knowing that program implementation in real-world settings often requires adaptability (Ennett et al., 2011; Rogers, 1995; Stern et al., 2008). The facilitators can implement games based on environmental factors, time, group size, and group dynamics. They can also adjust their facilitation style based on the environment and group dynamics. For instance, in a more structured environment facilitators may be less hands-on for more trustworthy or autonomous youth that can lead themselves through the games. As all programs require some adaptations to fit the community, organization, or population (Kelsey & Layzer, 2014), the flexible nature of the program may help ease new organizations into implementation.

The researchers conclude *UTC* implementation in a community-based setting, specifically MAGC, to be more successful than not. Though much of the success, despite the shortcomings observed, may be dependent on the organization's community ties and infrastructure to recruit participants. This supports past research and expert recommendations to ensure programs are an ideal fit for implementation in a particular organization or community (Demby et al., 2014). While organizations cannot foresee all implementation challenges based on the results of this study or future studies, those identified here, accompanied with planning tools and strategies (Tomioka & Braun, 2013), will help future organizations adequately assess their

fit with the program and plan for successful implementation (Demby et al., 2014; Kelsey & Layzer, 2014).

3.4.1. Limitations

The results of this study are subject to several limitations. First, only three of the four facilitators participated in interviews, reducing the insight provided regarding facilitation experience. Second, each implementation session only comprised four hours, allowing the youth time to play each game only once, for 20 to 30 minutes. Third, MAGC did not distribute the take-home activity prior to game play. This limited the researcher's ability to inquire and understand the distribution process of the activity ahead of time (particularly during program registration). While the take-home activity is not a pre-requisite to the games, the youth only participated in the program for one day, restricting the researcher's ability to collect data on that piece of the program. However, because of this the researchers concluded that in reality it is difficult for organizations to distribute this activity before game play, supporting multiple game play sessions to check-in on the youth's progress with the activity. Last, because of the small number of youth participants, the facilitators only led one group of students during game play. Implementing *UTC* with a larger group of students may have provided a different experience facilitators for facilitators by having to split their time and attention, and may have given the environment a different feel.

While the focus at the time of this study was understanding implementation for feasibility, future research is underway to determine the time needed to complete all content of the games and assess potential knowledge, attitude, and behavioral change among participants.

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4. ASSESSING THE PRACTICALITY OF USING THE CONNECT IN A COMMUNITY-BASED SETTING TO TEACH SEXUAL HEALTH

4.1. Introduction

Rural communities experience disparately high rates of teen birth (Hamilton et al., 2016), with limited options for sexual health programs. Currently, the federal government supports over 40 evidence-based programs (EBPs) for adolescent sexual health and teen pregnancy prevention (US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2017b). However, among the 40+ EBPs only one is exclusively for rural communities.

Organizations and service providers in rural communities are left with limited options to equip youth with sexual health knowledge and skills. One option is to select an EBP that appears to align with the organization and community's needs. A second option is to develop new programs or services.

For those opting to implement an existing EBP in their community, it is vital to assess the organizational fit (Demby et al., 2014; Stanton et al., 2005). While guidelines exist for supported adaptations to EBPs (US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2015), those implementing the EBP must maintain the core components of the program and its implementation fidelity (Fixen et al., 2005; Shearer et al., 2005). The organization must also have the infrastructure (such as management and leadership, staff, capacity, and resources) to carry out implementation (Demby et al., 2014). In such cases, if a program does not fit well within an organization, or necessary adaptations suppress the core program components, it may not produce the intended positive outcomes

(Demby et al., 2014; Fixen et al., 2005; Glasgow et al., 1999; Shearer et al., 2005; Stanton et al., 2005).

Other organizations may opt to create new programs to meet the specific needs of their community. In cases of creating new programs, feasibility testing is an important step to identify necessary modifications and demonstrate support for future implementation and rigorous testing (Arain et al., 2010; Bowen et al., 2009). If developers do not study the feasibility, communities are unlikely to implement programs long term as stakeholders want to see use of evidence-based interventions (Barfield et al., 2017; Plastino et al., 2017). Furthermore, it is unlikely other communities will adopt and implement the programs for lack of evidence showing positive outcomes (Manske et al., 2004).

4.1.1. Practicality of Programs

When developing new programs, many researchers assess the feasibility and/or efficacy of such programs (Allen et al., 2013; Chen et al., 2018; Dowshen et al., 2015; O'Malley et al., 2017). However, studies often neglect particular aspects of feasibility. According to researchers, feasibility comprises eight areas including: acceptability, demand, implementation, practicality, adaptation, integration, expansion, and limited-efficacy testing (Bowen et al., 2009). While some studies focused on one or more of the aforementioned feasibility aspects of sexual health programs (Allen et al., 2013; Anderson et al., 2017; Bottorff et al., 2017; Chen et al., 2018; Dowshen et al., 2015; Garcia et al., 2010; Levesque et al., 2017; Mitchell et al., 2016; Mustanski et al., 2015; O'Malley et al., 2017; Paiva et al., 2014; Skeer et al., 2016; Widman et al., 2017; Ybarra et al., 2019), to date, no research has been identified that focused on the practicality of sexual health programs.

Practicality studies, according to Bowen et al. (2009, pg. 8), examine the extent to which a program "…can be carried out with intended participants using existing means, resources, and circumstances." Past research analyzing the practicality of interventions from various disciplines focused on training, time, resources, management, and difficulty (Bellarosa & Chen, 1997; Hui & Chan, 2006; Manske et al., 2004; McClure et al., 1999; Reid & Nelson, 2002; Stevens & Ratcliffe, 2012; White & Arzi, 2005). Such elements of practicality are important as they can affect organizational decisions regarding adoption of such programs (Manske et al., 2004).

4.1.2. Assessing the Practicality of an Innovative Program

This study aimed to analyze the practicality of implementing *Using The Connect* with youth in a community-based setting/organization to teach sexual health content and skills. Previous studies (Chapters II and III of this dissertation) assess and discuss other feasibility aspects preceding practicality (specifically acceptability and implementation); this study builds on the findings from those studies.

UTC is an innovative sexual health program for youth in grades 6-8. Developed through human-centered design strategies, *UTC* is a game-based learning program designed as a set of educational games that equip youth with sexual health knowledge and skills to reduce teen and unintended pregnancy. Specifically, the program focuses on changes to the mind and body during adolescent growth and development, accessing credible health information, communicating effectively, problem solving to make healthy decisions, and fostering safe connections between youth and trusted adults in the community. The program comprises four games, played in a facilitated environment, and one take-home activity.

From January to March 2019, Michael's Angels Girls Club, Inc. (MAGC) implemented *UTC* one Saturday a month at the MAGC facility with youth from the Tarboro, NC community.

Sessions lasted approximately four hours. As a youth-serving organization, MAGC recruited youth to participate in the program for feedback. Youth participants received a free lunch, snacks, and gift card incentives to compensate for their time.

4.2. Methods

The primary research question guiding this study is: How practical is *UTC* for a community-based organization (CBO) to teach sexual health knowledge and skills to youth? The researchers specifically focused on program characteristics and the practicality from an organizational perspective by focusing primarily on organizational level factors. Feasibility researchers suggest practicality focus on four elements: 1) ability to carry out activities, 2) factors affecting implementation ease or difficulty, 3) effects on target audience, and 4) factors affecting time, efficiency, and quality (Bowen et al., 2009). The sections below describe the research design. This study was approved by the Texas A&M University Institutional Review Board prior to data collection.

4.2.1. Study Design

This study followed a single case study design, utilizing a mixed methods approach to collect four sources of data for all implementation sessions (n=3); only data from the last two implementation sessions were analyzed for this study. Data from session one was excluded as program developers modified program activities after the first session; therefore experiences with the first session may not align with the final program design.

Grounded in a constructivist paradigm, the researcher aimed to understand the experiences of the youth and facilitators within the context of surrounding community, organizational, cultural, interpersonal, and individual factors (Lincoln et al., 2018; Lincoln & Guba, 1985; Mertens, 2019). Through constructivism, researchers focus on understanding the

case through the multiple perspectives of participants derived from multiple sources of data (Creswell & Plano Clark, 2018; Lincoln et al., 2018). The sections below describe the procedures used for this study.

4.2.2. Participants

This study used a convenience sample of facilitators (n=4) and youth (n=8). As MAGC recruited youth to participate in UTC, the researcher recruited *UTC* participants (both youth and facilitators) to also participate in the research activities. Upon arrival for the program, the researcher approached participants in-person to inform them of the study and invite them to participate. All participating youth and facilitators agreed to participate in the study. All participating youth (n=8) were in grades 6-8 and identified as African American. The second session included two males and one female; the third session included five females. Table 4.1 provides demographic information for the facilitators.

Table 4.1 Facilitator Demographics

					Sessions		
Facilitator	**Age**	**Gender**	**Race**	**Current Role**	**1**	**2**	**3**
Kandice	41	F	Black	MAGC Staff	X	X	X
Ashley	39	F	Black	MAGC Staff	X	X	X
John	24	M	White	Health Educator (County Health Dept.)		X	
Jaleesa	18	F	Black	Former MAGC Participant			X

4.2.3. Data Collection

The researcher collected four types of data for this study including observations, youth surveys, facilitated discussions with youth, and facilitator interviews. The observations, surveys, and facilitated discussions all took place at the MAGC facility during, and immediately following program implementation; facilitator interviews occurred later, within two months following implementation.

The lead author of this study conducted the observations, facilitated discussions with youth, and facilitator interviews. She was a third-year doctoral student having completed extensive coursework and training in research methods and design, and data collection and analyses methods for quantitative and qualitative data. Prior to the study, the researcher did not have a relationship with the youth or the two external facilitators; however, she previously worked with the two MAGC staff in program development workshops. To build rapport with the youth, the researcher introduced herself to the youth, told them why she was there and what she would do during the program, and allowed the youth to ask questions they had; she also participated in icebreaker and introduction activities. To build rapport with the external facilitators, the researcher introduced herself before the youth arrived, and discussed the research study and her role. The researcher transparently told participants she was there to learn from them, and get their feedback to inform potential program modifications, therefore she wanted their honesty, whether positive or negative. She told the youth she hoped and expected the games would be fun and educational, but that she wanted to know what they thought and experienced.

4.2.3.1. Observations

During all implementation sessions (n=3), the researcher conducted observations as a non-participant observer and took notes using an observation guide. The researcher developed the observation guide using principles from the Template for Intervention Description and Replication (TIDIeR) (Hoffmann et al., 2014) to ensure observation and documentation of all aspects of implementation as objectively as possible. After each session, the researcher asked facilitators about their initial perspectives and observations of implementation. The researcher noted the facilitators' input on the field notes with a different color to compare and incorporate

the facilitators' perceptions. The researcher used the field notes to write a thick description narrative for each implementation session, elaborating on the field notes.

4.2.3.2. Youth Surveys

After completing all four games, during each session (n=2), the youth (n=8) completed a 17-question survey (with paper and pen) anonymously. The survey contained questions about their experience with the program, derived from previous feasibility studies (Gilliam et al., 2014, 2016; Levesque et al., 2017). For this study, researchers analyzed eight questions (listed in Table 4.2) centered on perceived learning outcomes; five of which contained four-point Likert scale responses (strongly agree to strongly disagree), and three contained dichotomous responses (Yes or No).

Table 4.2 Program Survey Questions for Practicality

Question	Response Scale
The program could help people learn about sexual health	SA (1) – SD (4)
The program could help people learn how to talk to adults in their community	SA (1) – SD (4)
The program could help people learn how to access credible health information	SA (1) – SD (4)
The program could help people learn how to communicate better	SA (1) – SD (4)
The program could help people learn how to make healthy decisions	SA (1) – SD (4)
Do you think you will use information from the program in the future?	Yes (1) or No (2)
Would you recommend this program to a friend?	Yes (1) or No (2)
Would you want to participate in this program again?	Yes (1) or No (2)

Response Scale Key
SA = Strongly agree
SD = Strongly disagree

4.2.3.3. Facilitated Discussions

Facilitated discussions with youth (n=8) took place at the end of program implementation, which lasted approximately 25 minutes. To guide discussion, the researcher

developed and used a discussion guide with eleven questions based on the Consolidated Framework for Implementation Research (CFIR) (Damschroder et al., 2009), and the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) framework (Glasgow et al., 1999). For this study, researchers focused on responses to two questions related to practicality; though they reviewed all transcripts from beginning to end for relevant content. Only the youth participants, facilitators, and the researcher were present during facilitated discussions. All facilitated discussions were audio recorded and transcribed verbatim for analysis. Due to logistical issues (sending transcripts from Texas to youth in North Carolina, and discussing the purpose of their review and gathering their feedback remotely), the researcher did not return transcripts to the youth for comments.

4.2.3.4. Facilitator Interviews

The researcher conducted facilitator interviews (n=3) over the phone, using an interview guide. One of the four facilitators moved and was unreachable at the time of conducting facilitator interviews. The facilitator guide, developed using the Consolidated Framework for Implementation Research (CFIR) (Damschroder et al., 2009) and the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) framework (Glasgow et al., 1999) principles contained ten questions. However, because this study focused on practicality, researchers focused on responses to five questions (see Table 4.3), though they reviewed all transcripts from beginning to end for content relevant to practicality. The researcher offered to send the interview guide to facilitators to review, but no one requested a copy. All interviews lasted approximately 20 minutes and were audio recorded and transcribed verbatim. The researcher offered to send final transcripts to facilitators for review, but all declined the need.

Table 4.3 Facilitator Interview Questions for Practicality

Construct	Question
CFIR (Characteristics of Individuals) **RE-AIM** (Efficacy)	Share with me how you think this program affects the participants?
CFIR (Inner Setting)	Tell me your thoughts on the ideal place/setting for implementing this program?
CFIR (Process)	What do you think is the ideal way to implement this program? (Think about number of facilitators, participants, etc.)
RE-AIM (Reach)	What are your thoughts on recruiting youth in grades 6-8 for this program?

4.2.4. Data Analysis

Data analysis began with quantitative data, followed by qualitative data. Upon analyzing both quantitative and qualitative data, the researcher constructed a matrix to compare and triangulate the results for final conclusions.

4.2.4.1. Quantitative Data (Youth Surveys)

The researcher analyzed quantitative data from youth surveys using Stata Statistical Software (StataCorp, 2019). Due to the limited sample size, only descriptive statistics were run (means, medians, modes, and frequencies) along with Fisher's Exact Test to identify statistically significant differences.

4.2.4.2. Qualitative Data (Observations, Facilitated Discussions, and Facilitator Interviews)

The researcher trained two additional graduate students to help code qualitative data to have a team of three coders. Both coders previously completed coursework in qualitative research methods and data analysis and had experience with qualitative data analysis.

Following collaborative qualitative analysis (CQA) procedures (Boyatzis, 1998), to increase trustworthiness and reduce bias of findings, the analysis process drew on the perspectives of multiple reviewers (Olson et al., 2016; Patton, 2015; Richards & Hemphill, 2018). Team members reviewed and coded each qualitative data source separately, generating

codes through a combination of pre-existing codes and emergent codes to deepen the researchers' understanding and interpretation of the data (Glaser & Strauss, 1967; Richards & Hemphill, 2018; Yin, 2014). The researcher derived a list of pre-existing codes from CFIR constructs (Damschroder et al., 2009), and sample outcomes of interest identified by researchers for practicality including: 1) factors affecting implementation ease or difficulty, 2) ability to carry out activities, 3) effects on target audience, and 4) factors affecting implementation efficiency, speed, and quality (Bowen et al., 2009). Upon completing coding, they combined all sources of data for thematic analysis and triangulation of findings. The research team identified resulting themes from the final codes, with an inter-rater reliability coefficient of 0.92.

4.3. Results

4.3.1. Quantitative Results

Quantitative data results show strong support from the youth for *UTC* as an educational program for sexual health content and skills, as shown in Table 4.4. All youth agreed *UTC* could help teach the sexual health topics and skills it incorporates, which they emphasized and described during the facilitated discussions (further discussed in the Qualitative Results section). They also all thought they would use the information they learned from the program in their future. While all youth said they would want to participate in the program again, one of the eight youths said they would not recommend the program to a friend.

Table 4.4 Program Survey Results for Practicality

Objectives	Responses	
	Agree	Disagree
The program could help people learn…		
about sexual health	100% (n=8)	0% (n=0)
how to talk to adults in their community	100% (n=8)	0% (n=0)
how to access credible health information	100% (n=8)	0% (n=0)
how to communicate better	100% (n=8)	0% (n=0)
how to make healthy decisions	100% (n=8)	0% (n=0)
	Yes	No
Do you think you will use information from the program in the future?	100% (n=8)	0% (n=0)
Would you recommend this program to a friend?	88% (n=7)	12% (n=1)
Would you want to participate in this program again?	100% (n=8)	0% (n=0)

4.3.2. Qualitative Results

During the analysis process 14 themes emerged, some overlapping each other. After coding the data and sorting the codes into corresponding themes, the research team aligned each theme to the aspects of practicality proposed by feasibility researchers, as relevant and/or meaningful (Bowen et al., 2009). The aspects of practicality include: 1) ability to carry out activities, 2) factors affecting implementation ease or difficulty, 3) effects on target audience, and 4) factors affecting implementation efficiency, speed, and quality (Bowen et al., 2009). Some themes naturally tied to one aspect, while some themes split across multiple aspects. To provide a deeper understanding of the practicality of *UTC*, the themes are discussed below by aspects of practicality.

4.3.2.1. Ability to Carry Out Activities

For many programs, there are at least two primary stakeholders to consider regarding ability to carry out activities: the person or organization implementing the program, and program participants. In this study, the researchers considered the ability of the youth to play the games,

as well as the organization (MAGC) and facilitators implementing *UTC*. Between the youth and stakeholders, four themes arose including: 1) materials and resources, 2) physical space, 3) facilitation needs, and 4) program manual.

4.3.2.1.1. Materials and Resources

To complete the games, the participants need specific materials, all of which come packaged together in the program box. While most materials are necessary for gameplay, some materials serve as a resource. Some games have supplemental resources to help youth find answers to some game questions. For example, *The Sum of The Parts* has labeled anatomy diagrams behind the instructions, and *More Than Words* has a resource sheet with definitions and examples of communication skills and styles incorporated in the game. Observation notes indicated the youth used these resources two to three times during each round of game play. Having such resources may allow the youth to learn autonomously. Additionally, the take-home activity entails consumable items for the youth to take and keep. Therefore, once facilitators distribute all take-home activity materials, the organization will have to purchase additional sets for future participants to complete the activity. It is important to note this will also require planning from a financial and logistical perspective of the organization.

There is one resource for *Tapped In* not included in the program box – a smart phone, tablet, or computer (with internet access) to complete challenges. While the youth can complete some challenges without a device, many require an internet-enabled device. Therefore, if the youth do not have a smart device and internet access, and the facilitator or organization cannot provide them with one for the challenges, they will cannot complete all activities within the game.

4.3.2.1.2. Physical Space

All facilitators stated to implement the program, you need to have the space to do it. Each game needs at least enough space to accommodate the game materials (including game boards which range from 2' x 2', to 5' x 10') and the participants. Participants can play games while sitting down at a table or on the floor. However, the *Stop • Think • Act* game contains a "life-size" board (5' wide by 10' long) participants physically stand and move on, which requires open floor space. At MAGC, the facilitators set up each game [that would fit] on a standard rectangular table with four to six chairs around for participants, and laid out *Stop • Think • Act* on open floor space in the middle of the room.

As long as there is enough room physically for the games and participants, facilitators felt they could implement *UTC* almost anywhere. One facilitator said, "I don't think there's any necessarily bad place to have it. Um, as long as it's like, you know, not a loud or distracting environment."

4.3.2.1.3. Facilitation Needs

The primary role of facilitators was to instruct and guide the youth through the activities. They needed minimal knowledge of sexual health content going into the program due to the structure of the games. In the facilitated discussions the youth also agreed that for some games they didn't need a teacher and could go through them on their own. However, observations and facilitated discussions also revealed for some games the youth needed step-by-step instructions to walk them through the game at least once, help with pronouncing some words, and examples of how to answer or respond to some game questions.

4.3.2.1.4. Program Manual

Facilitators unanimously agreed you do not need any formal training to implement *UTC*. They also collectively claimed to need one thing to implement *UTC* – the program manual. One facilitator stated:

> Everything was laid out for you. Um, the user manual was very well written. It told you what you needed, what you had to do, um kind of how it should be progressing throughout. So I thought that was helpful from an implementation standpoint.

Because of the game structures, the manual was instrumental in the facilitators' ability to carry out program activities providing them with step-by-step instructions for the games, facilitation tips, copies of game questions and answers, and background and supporting information.

The research team attributed the aforementioned themes regarding ability to carry out activities to the unique structure of *UTC* as a set of games. An organization must have all necessary program materials. Besides the program materials, participants need a smart device with internet access, though not at all times. Additionally, the organization needs to have enough physical space to implement the games with the youth, which may be contingent upon the number of participants, and possibly the game(s) being played during a session. When gameplay begins, the facilitator needs to be prepared to walk the youth through game instructions, help answer questions, and provide examples along the way. Fortunately, to implement *UTC* facilitators do not need formal training, rather the program manual to guide them in their role.

4.3.2.2. Factors Affecting Implementation Ease or Difficulty

The research team identified four themes as factors affecting implementation ease or difficulty, which include: 1) facilitator background, 2) program structure, 3) setting, and 4) community ties. Based on the data, researchers interpreted these factors as enablers or barriers, rather than necessities, to implementation and youth engagement.

4.3.2.2.1. Facilitator Background

Facilitator interviews and observation data revealed particular facilitator background characteristics that can make implementation easier, specifically experience, knowledge and understanding, soft skills, and age/relatability. All facilitators indicated the most important type of past experience was working with youth. By having experience working with youth, they felt it would prepare any facilitator to respond appropriately and have the patience for addressing any discomfort among the youth. This ties to the facilitators' belief that one would not need extensive sexual health knowledge to implement the program. Rather, they felt it was important to be knowledgeable about the community culture and youth's comfort with the topic, and understand the youth will have varying backgrounds with sexual health. One facilitator said:

> I think working with youth would be very important because well you have to sort of understand where they are coming from; they don't know all of this information. Um and they are not going to be obviously as "adult" about it as an adult is going to be so, just knowing that and being patient is going to be key. And if you do have past experience teaching sexual health, that would be great, um, but obviously it's not going to be a requirement.

Thus, having soft skills, such as patience and active listening, will ease the facilitator in addressing the youth's questions, and possibly reactions and actions during the program.

Last, relatability and age came up in all three facilitator interviews. All felt it was important the youth feel they can relate to the facilitators and thought age may affect relatability. One said, "Something that may make it easy may be the age of the facilitators. Because you know kids tend to feel more comfortable around people who they feel like they can relate to more." Given the range of backgrounds among the facilitators, all appeared to relate to the youth in some form or fashion by drawing on their various experiences, knowledge, and skill sets. Observations noted facilitators did not exert power over the youth, rather, they provided personal examples for youth, referred to their knowledge of experiences other youth had previously

shared with them, asked the youth questions about their values and experiences to which the facilitators validated with affirming and supportive responses.

4.3.2.2.2. Program Structure

The program structure eased implementation with youth in several ways. First, the games engaged the youth and did not require much effort from facilitators to hold their interest. Because of the game designs, youth felt like they were playing actual games and had fun while learning. One facilitator stated, "It was a fun way for them to get accurate knowledge without feeling like you know they were being lectured." The youth echoed this during facilitated discussions as they commented on the games being fun; one youth from the third session stated, "Like it was a board game, like a regular board game and it didn't look like what it was talking about." Two youths from the second session also said it was fun and educational because, "you're doing something," rather than sitting at a desk. Overall, they appeared to enjoy the game design and observations supported this as engagement remained high most of the time. Additionally, the youth appreciated learning with each other rather than from a teacher. This structure allowed them to work together rather than relying on all information to come from a teacher. Though the youth did not experience a previously existing EBP, in both sessions the youth made several comments about wishing teachers did this type of program more.

4.3.2.2.3. Setting

The setting of program implementation is an important factor to consider regarding the practicality of any program. For *UTC*, the theme "setting" comprises physical space, physical set-up, and environment/climate. Physical space as discussed in section 4.3.2.1.2 above (Ability to Carry Out Activities), entailed the basic necessity of having enough space, which ultimately

affects program implementation abilities – that it can be played ultimately anywhere and in various settings such as schools, community organizations, etc.

While the physical space affects implementation possibilities, the physical set-up within a space can ease implementation. Observation notes indicated facilitators set-up each game in its own area, away from other games, before implementation began. This allowed the youth to see each of the games around the room and transition from one game to the more easily. During facilitator interviews all facilitators said it was helpful to have each game already set up and dispersed around the room.

All facilitators brought up the environmental climate of the setting as enablers to successful facilitation. The environment/climate is the climate, feeling, or energy in the room during the program. Facilitators all specified *UTC* implementation should ideally take place in a setting where youth feel safe and comfortable. Regarding the comfort of the setting, one facilitator stated:

> If they're in an environment where they're used to going… the environment to them is already going to be comfortable. So, that's going to be helpful for any sort of sexual health implementation ideal. Um, but I don't think it would be necessary because if you're going to do it in a community, you might not have that luxury to do it within a setting they're familiar with.

They also acknowledged the physical space or environment, as well as the people there and the relationships youth have with them, can influence this sense of safety and comfort. Another facilitator commented on the influence of setting and the social environment and said, "I think that kind of made it easy, the environment, just choosing – make sure you're in the right environment and who is at the table. Or how comfortable the kids are with the facilitator… you know, relationships I guess."

While community programs may be limited in options for the physical setting and set-up, it is important organizations consider creating a comfortable climate for the youth participants.

As sexual health may be an uncomfortable topic for youth, the organization and facilitators can take steps to build trusting relationships to help the youth be comfortable participating and opening up.

4.3.2.2.4. Community Ties

Observations showed strong ties between MAGC and the Tarboro community in several ways. First, they recruited youth that are not regular MAGC program participants. This shows MAGC has connections to people and organizations in the community, and/or the community knows MAGC as a youth-serving organization. The interaction between MAGC staff and parents while dropping off their kids seemed positive. Several parents appeared to know the MAGC staff based on their interactions and conversations; they seemed to know and trust the staff with their children. For those that did not converse with staff, they dropped off their kids without question or concern. Even when parents could not get their youth to the facility, they allowed MAGC staff to provide transportation for their kids. This evidence of community ties made implementing *UTC* easier for MAGC specifically, as they did not have parents questioning their youth's participation in the program.

Another way MAGC's community ties eased implementation was by being aware of people and places in the community that could be resources for the youth. Specifically, one part of the *Stop • Think • Act* game notifies the participants of local youth-friendly people, places, and providers that the youth can access. Prior to implementation, facilitators need to contact local resources and get business cards to use for this section of the game. While MAGC did not complete the task to have the business cards, the staff verbally informed the youth of local resources. Without strong ties to the community, they would not be aware of the various people and places, and the services they provide.

4.3.2.3. Effects on Target Audience

Based on youth responses, the program appeared to have many positive effects on participants. Key themes included sexual health knowledge, skill development, normalizing sexual health, and modes of learning.

4.3.2.3.1. Sexual Health Knowledge

First, *UTC* taught youth a breadth of sexual health information, even in one session. Youth reported learning about reproductive rights, contraception, sexually transmitted infections, anatomy (and the appropriate words for body parts), trusted adults they can talk to, personal safety, meanings and definitions of words and concepts, and resources for sexual health information. When discussing how they learned about anatomy in *The Sum of The Parts*, one youth from the third session said, "I like this one cause I think if we play it all the way through it will teach you more about body parts and how to take care of them." Regarding trusted adults, one youth from the second session stated:

> Because it like let us know that there are certain adults you can trust and just – like how you asked us questions like would you trust your nurse or doctor or a counselor at school and y'all gave us explanations like the counselor like their job is to be there for the kids and to help them through thing they're probably going through and stuff so we can trust them.

4.3.2.3.2. Skill Development

Building on content learned, the youth claimed to learn various skills associated with their health including mindfulness, communication, and decision-making skills. They discussed how these skills could benefit them regarding sexual health and more.

Observation notes indicated one game, *The Sum of The Parts*, had youth do a breathing exercise and even jumping jacks to teach them about controlling their emotions and mental state. Regarding these activities, one youth claimed, "But that's why a lot of kids probably get expelled because they're mad – because if like if they had a bad day, and by them doing, you know things

like this that'll make them feel better." Two others agreed and liked the physical movement incorporated in the games and that they were "doing something."

As for communication, the youth felt *UTC* helped them with communication in various ways; communication regarding health, general communication skills, and communicating with peers and adults. One youth said, and a second agreed, "Like use respect, sympathy, and that when talking in a conversation. Like not just about birth control but using it in general."

Observation notes, facilitated discussions, and facilitator interviews all portrayed evidence of youth practicing and developing skills regarding decision making. First, observations noted youth using process of elimination in several games before deciding on an answer or response. Youth also compared various scenarios, and outcomes associated with their options. When stating what they learned, one youth from the third session stated:

> Like, before you respond, if something really bad happens, you need to think about like the pros and cons like we did earlier, what the solution could be, um what might could happen if it's not the right decision you made and different things like that.

Similarly, a youth from the second session said they learned, "How to think about like our decisions and the effect that our decisions will impact."

4.3.2.3.3. Normalizing Sexual Health

The youth didn't just learn about sexual health information and skills through *UTC*, they also learned the importance of using, and normalizing the use of, medically correct words. Observation notes indicated at the beginning of the session, the facilitator asked youth to use the medically correct words, and reminded them that even though it may be awkward at first, they are just words. The youth in the second session all agreed that helped them feel more comfortable using the medical terms and that *UTC* could help them become more comfortable using them. One youth stated:

> Yeah because like as you talk about that over and over again you will start to get comfortable. Like when you talk about things – like how you was telling us about the words that we use for doctors and stuff – how some people aren't comfortable with saying those words but as you get older you're gonna have to anyway so by learning and like saying them, getting used to saying them, it's not going to be uncomfortable anymore so you do.

Facilitators felt this program showed youth sexual health is not a taboo subject, and that it's okay to ask questions about sexual health. Two facilitators felt implementing this program shows youth they are not the only ones that have questions related to sexual health, and that it's okay to ask questions and talk about it. One facilitator stated:

> I think it lets them know it's not taboo to talk about things. Sometimes it's just better to ask the question than not to know or just assume that you know… I think it, for those that actively participate, it's more of a, I guess it's a liberating experience to be able to ask the question and not feel like you're going to be shamed for it or judged for your question.

4.3.2.3.4. Modes of Learning

An important feature of *UTC* that contributes to the effects on its participants is the design and function of UTC to personalize content to its participants. One way is to personalize it to the community. The facilitator or planning organization incorporates local resources into games so that youth learn about local people, places, and providers they can seek. The facilitator can also select which content is covered first by putting certain playing cards at the top of the decks. This is particularly helpful if there are any relevant "hot topics" of interest in the community to discuss first. Another way it allows personalization is with the youth specifically. Often the games have the youth answer from their perspectives, revise a script to use their own words to practice communicating, or think about decisions they could make. These features allow the content to apply to them and their lives, to which the youth stated in facilitated discussions the scenarios and information were relatable for them.

The youth and facilitators indicated that the aforementioned effects of *UTC* prepares youth for the future. One facilitator said, "I think it makes them more prepared for whatever

decisions you know, they have to make." The program offers the youth a chance to learn about information that can benefit them in the future, if not now. One youth stated, "This feels real mature for our age." Through teaching and normalizing sexual health content and skills, and offering various modes of learning that allow the youth to personalize the information, it will equip them to have control over their health and the decisions affecting their health.

4.3.2.4. Factors Affecting Implementation Efficiency, Speed, and Quality

Two themes surfaced regarding the efficiency, speed, and quality of *UTC* implementation: 1) facilitator role, and 2) time.

4.3.2.4.1. Facilitator Role

First, the facilitator role enhanced the quality of implementation by having the youth reflect on their answers. Though their primary role was to guide and oversee the youth, they consistently interacted with the youth. Throughout the games, the facilitator would have the youth think about the "how's" and "why's" of their answers. This helped the youth go beyond their answers and think about the reasons and contexts that surround or influence them. It is important to note the facilitator's role in probing the youth to reflect on their answers is contingent upon the facilitator to youth ratio. If one facilitator is overseeing multiple groups, they reduce their time with each group and hinder their ability to have the youth reflect on the content.

4.3.2.4.2. Time

The second theme, time, has several components to it. First, the time to complete one round of a game decreases when: 1) the facilitators show an example round, and 2) once the participating youth have gone through one full round. Second, some games, and activities within the games, take more time than others to complete. For example, *Stop • Think • Act* requires physically moving across a large board; *Stop • Think • Act* and More Than Words require

writing, which takes time; *The Sum of The Parts* and *Tapped In* both have activities for the youth to complete that may take from three to seven minutes to complete before moving on to the next person; and all games contain some questions or scenarios that may require thought before answering. Third, youth engagement can affect the speed and efficiency of the games. Youth that were more engaged and/or worked together moved faster through each of the games. Last, hesitation among youth can affect time to complete games and activities. Sometimes youth were hesitant to answer questions or begin and lead activities. This hesitation, albeit small, cuts into the speed of moving through games. All the aforementioned factors affect the time to complete one round of each game, which can affect the time to complete all program games. Facilitators may attempt to combat these factors by encouraging groups to work together, and setting time limits.

The facilitator role primary affects program quality, while the various aspects of time can affect the efficiency and speed of completing program games. However, the speed of the game can also affect program quality by rushing through games and associated activities or dragging them out for too long and the participants losing interest. It is important facilitators use their role to balance the speed of games while contributing to enhancing the quality to ultimately benefit the participants.

4.4. Discussion

Although rates of teen birth and risky sexual behavior have decreased significantly in the US, disparate rates remain in rural communities (Hamilton et al., 2016). One possible reason for this is the lack of EBP options designed for rural communities. As researchers attribute much of the success in declining teen birth rates to implementing EBPs (Livingston & Thomas, 2019), the field needs additional programs showing promise of becoming EBPs to fulfill the unmet need in

rural communities. Rural communities differ from urban and even suburban communities, therefore it is vital they have program and service options with evidence to support and empower rural youth in their health (Phillips & McLeroy, 2004). As sexual health programs are developed, researchers need to assess the practicality of those programs to garner support for future implementation and adoption by other organizations, and to move towards rigorous evaluation (Edelson, 2017; Manske et al., 2004; McClure et al., 1999). This study analyzed the practicality of implementing *UTC*, an innovative game-based learning program, in a CBO setting in a rural town in North Carolina.

Overall, the findings of this study support *UTC* as a practical program for CBOs to implement. The program structure comprising games the youth can often lead themselves through, combined with a program manual providing step-by-step instructions and tips for facilitators, led to facilitators successfully implementing the program with little to no training. The youth and facilitators carried out activities successfully. The facilitators used their role to enhance the quality of learning to ultimately support the positive effects on the youth. Additionally, *UTC* required minimal resources from the organization aside from the standard time, personnel, physical space, a supportive environment, and community ties.

UTC appears to offer flexibility for the organizations implementing it in a few ways. First, facilitators believed they could implement *UTC* in various locations or environments because of the game designs and structure. Organizations may host sessions in non-traditional locations such as parks, rec centers, or other facility space as deemed appropriate and accessible to the participants. Second, there is not a required order for playing the games; facilitators can select particular games and even content to begin with based on relevance and interest. They can also opt to distribute the take-home activity before implementation sessions begin, or after the

first session. The external facilitators (one a health educator from the county health department and one a graduating youth participant of MAGC) revealed an important aspect of program flexibility regarding facilitators. Facilitators do not appear to need formal training on *UTC* before implementation, though their soft skills appeared to ease their interactions with youth, particularly when the youth had questions, or expressed discomfort with the content. Therefore, organizations may opt to rotate facilitators as needed, or solicit partnerships from other organizations and community members. Last, youth reported learning substantial sexual health information, skills, and resources through playing *UTC*. The ease of implementing *UTC* to produce the impacts reported by youth provide a practical program option for rural communities.

The minimal training requirements and flexibility within *UTC* is unique compared to many EBPs and important for CBOs seeking program opportunities for local youth. As many CBOs face frequent turnover (Mihalic et al., 2004; Shearer et al., 2005), *UTC* may be a more practical program option as it appears to not require formal training. This can also reduce the financial burden of organizations by not having to purchase the program and pay for formal trainings. Rather than a formal *UTC* training, organizations may opt to support professional development opportunities around facilitation, leadership, and group management techniques such as creating a safe learning environment, managing group dynamics and disruptive behavior, discussing sensitive topics, and/or deepening their knowledge of sexual health content (Rose et al., 2019).

The setting and physical space themes offer an interesting insight to the practicality of implementing *UTC* in a CBO. Though Maslow's Hierarchy of Needs apply to individual-level needs (Maslow, 1943), it may be translatable, in some part, to an organization's needs for identifying fit and practicality of programs. Findings from this study indicate the facilitators

needed to have an adequate physical space for the program. Moreover, the space ideally needed to provide a supportive learning environment with a trustworthy climate, correlating to the basic needs of Maslow's Hierarchy (Maslow, 1943). From an ecological perspective, the climate of the space is likely to be influenced by many things starting with the physical environment (McLeroy et al., 1988) – is it conducive to the program participants and materials, youth-friendly, accessible, welcoming, and secure. Community beliefs and the people present will also influence the climate. Therefore, it is important organizations consider those aspects and how they will affect the structure and climate when implementing a program.

4.4.1. Limitations

The results of this study are subject to its limitations. Limitations regarding study design include the small sample size and single implementation sessions. The single implementation sessions prevented the researcher from collecting data on the take-home activity as it was distributed at the end of the sessions rather than in advance. However, the researchers uncovered important findings relevant to the practicality of *UTC* with no major contradictions. Missing data (facilitator interview) also limited the findings as one facilitator was unable to share their perspective and experience. An additional limitation is the exclusion of including cost-related data, an aspect of practicality (Bellarosa & Chen, 1997; Bowen et al., 2009). As the overarching feasibility study allowed for program modifications, the researcher expected minimal continuity of program costs as program changes occurred throughout. Future research should examine organizational costs associated with *UTC* and how those compare to other program costs.

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5. CONCLUSIONS

5.1. Introduction

The primary purpose of this dissertation was to, through a case study design, analyze the feasibility of an innovative teen pregnancy prevention program, *Using The Connect* (*UTC*), designed for rural communities. To achieve this, the researcher wrote three independent articles: (1) Youth acceptability of a game-based learning program to prevent teen pregnancy (Chapter II), (2) Assessing the implementation process of an innovative teen pregnancy prevention program in a community-based organization (Chapter III), and (3) Assessing the practicality of *UTC* in a community-based setting to teach sexual health (Chapter IV).

To answer the research question, "to what extent is *UTC* feasible for use in a community-based organization?" the researcher used a mixed-method case study design for a single case (Guetterman & Fetters, 2018) following a constructivist approach (Lincoln & Guba, 1985; Mogashoa, 2014). The case was the implementation of *UTC* (program), at Michael's Angels Girls Club (community based-organization), in Tarboro, NC (community); where the program, *UTC*, was an embedded unit of analysis within the organization (Yin, 2009). Unique to this case was a community–academic partnership between Michael's Angels Girls Club, Inc. (MAGC) and the Innovative Teen Pregnancy Prevention Programs (iTP_3) project team at Texas A&M University that fostered the development of *UTC*. This study assessed the feasibility of implementing *UTC* in a CBO setting; therefore, the specific unit of analysis focused on feasibility of *UTC* at the organizational level. However, following the recommendations of researchers and methodologists (Bronfenbrenner, 1979; K. R. McLeroy et al., 1988; Wilson et

al., 2017) it was important to consider the contextual and community factors surrounding the organization that may have influenced program implementation.

Data collection comprised both quantitative and qualitative data: youth surveys, facilitated discussions with youth, observations of program implementation, and facilitator interviews. For each article, the researcher analyzed varying combinations of the data to answer their respective questions. A team of three independent reviewers coded all qualitative data following a collaborative qualitative analysis process (Boyatzis, 1998) to increase trustworthiness and reduce bias of findings (Olson et al., 2016; Patton, 2015; Richards & Hemphill, 2018). Upon reaching final themes for each article, the researchers merged all data and findings to reach final conclusions for the overarching research question. The sections below summarize the key findings for each article and corresponding implications for the field, followed by a culminating conclusion for the dissertation and its contribution to the field.

5.2. Chapter Findings and Implications for Health Education

5.2.1. Youth Acceptability

The research question for this study was: To what extent is *Using The Connect* acceptable to youth participants in the Tarboro, NC community? The insight gathered from youth participants of *UTC* through observations, surveys, and facilitated discussions revealed four major findings around acceptability of *UTC* to youth. First, youth liked the look and design of the *UTC* games. Not only did the games look and feel like actual games to the youth, they were educational for them as well. The design of the games allowed the youth to have fun and learn information and skills without feeling like they were in school. First impression was important to gaining youth interest and support and results from this study indicate *UTC* is attractive to, and engaging for, participants (Abt, 1970; Bowen et al., 2009; Haruna et al., 2018; Kapp, 2012).

Second, youth reported learning about sexual health content, skills, and resources. Regarding content, the youth reported learning about anatomy and physiology (including the medically correct words), how to take care of their bodies, and what various words and phrases mean. Building on the newly learned health content, the youth reported advancing in two areas of personal skills: communication and decision making. Youth practiced applying communications skills and responding to different styles of communication. They also practiced thinking through the possible outcomes and impact of decisions they could make, to identify healthier decisions. Last, the youth learned about and practiced accessing credible sources of information to know where to find the answers to questions they may have. This combination of learning content, practicing skills, and identifying resources will equip youth to engage in safer sexual health behaviors. As the primary purpose of game-based learning (GBL) is to educate participants through games (Noemí & Máximo, 2014), *UTC* appears to achieve its purpose.

The third key finding from the acceptability study is creating connections between youth and trusted adults. Positive adult-youth relationships are integral to adolescent wellbeing and success (Bellis et al., 2017; Meltzer et al., 2018; Pringle et al., 2018). The youth participants expressed building these relationships begins with casual conversations that, overtime, increase in intensity and depth. Then, as youth develop stronger connections with the adults, they will be more comfortable talking to them about personal and complicated topics. Because of this, the youth appreciated the conversation cards for the take-home activity did not include personal or sensitive questions. Their willingness to talk to adults using the conversation starters shows the activity is suitable to them (Bowen et al., 2009).

The last major finding from the acceptability study is the complexity of talking about sex and sexual health. Most youth stated they do not talk about sex or sexual health at all, which is

culturally common for rural communities (Guttmacher Institute, 2017; Hallum-Montes et al., 2016). Then, if or when sex or sexual health comes up, it is both hard and uncomfortable for them to talk about, which often can lead to changing or avoiding conversations, thus repeating the cycle of not talking about it. However, the participants agreed it was important to learn the information for their future. The discomfort with sex and sexual health did not appear to result in youth withdrawing from, or becoming disengaged in *UTC*.

In summary, youth appeared to enjoy *UTC* and learned valuable knowledge and skills through their participation. All youth said they would want to play again, and 92% would recommend *UTC* to a friend. For future participation, youth said they would want to play with more people to hear unique perspectives. These major findings ultimately led the researcher and research team to deem *UTC*, an innovative GBL program, as highly acceptable to rural youth as it was not only fun but educational (de Freitas, 2006; Garris et al., 2002; Noemí & Máximo, 2014).

The findings of this acceptability study contribute to the health education field in several ways. First, it contributes to program feasibility literature by focusing explicitly on the acceptability of a new program to intended users. While many studies have analyzed program feasibility, few exclusively address acceptability among the users (Bauermeister et al., 2015; Bottorff et al., 2017; Mustanski et al., 2015; Paiva et al., 2014; Skeer et al., 2016; Widman et al., 2017; Ybarra et al., 2019). It contributes to identifying factors that make a program acceptable to middle-school aged youth in rural communities. Such factors will allow health education professionals to determine if the program may be transferable to other communities, and provide support for gaining youth buy-in for *UTC* (Garcia et al., 2010). Thus, the users' acceptability of a program is integral to future participation and can assist in recruitment efforts. Ultimately, the

acceptability of *UTC* lends support towards having a new sexual health program option for rural communities, that is fun for youth, to fill gaps in existing evidence-based programs (US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2017). Meanwhile, from a community level, this study exposed youth in Tarboro, NC to a program that began equipping them with essential sexual health knowledge and skills.

5.2.2. Implementation

Chapter III focused on the extent to which *UTC* could be successfully implemented within MAGC (Karsh, 2004). To examine *UTC* implementation, researchers used observations and facilitator interviews to assess the degree of execution and organizational capacity and fit (Bowen et al., 2009; Orsmond & Cohn, 2015), revealing key information around the program structure, facilitators, group dynamics, recruitment, nesting the program, time, and the environment. Researchers found some themes to be more complex than others and include sub-themes (program structure, facilitators, and environment); while some were less complex but provided meaningful insight to keep in mind for future implementation (group dynamics, recruitment, nesting the program, and time).

From an organizational perspective, the *UTC* structure required minimal resources from MAGC for implementation and provided a user-friendly game manual for facilitators. All *UTC* resources and materials, included in the game box, require minimal inputs from the organization aside from updating content to fit the community. The manual provides step-by-step instructions to update content to fit the community. The *UTC* structure offers flexibility in implementation. First, the facilitators can start with any of the four games. During all three implementation sessions, the youth played the games in various orders, and this did not affect the ability to

complete any one game. Second, the facilitators can reorder game cards, and thus select the content discussed. For example, at each of the sessions, facilitators selected cards with information youth had recently discussed to place at the top, which did not have a negative effect. The game manual provides all instructions for the facilitators. According to facilitators the manual, "explained and laid everything out;" "is very user-friendly;" and "It told you what you needed, what you had to do, kind of how it should be progressing throughout." Per facilitators' recommendations, the developers updated the manual to include both scripted text, and a summarized list of instructions for each game. This was to meet varying preferences of facilitators by providing the option to read word-for-word from the manual, or use their own language, which may be more youth-friendly or culturally relevant.

Because of the structure, facilitators stated their primary role was to guide youth, assisting as needed, by providing examples and answering questions. Observation notes supported this role. Facilitators reported the structure, coupled with a user-friendly game manual, enabled the facilitator role to occur without formal training. Observation of two facilitators (external stakeholders) without prior exposure or training that successfully implemented *UTC* confirmed this. Observation notes reported, "[Facilitator] seemed comfortable just taking the manual and jumping in."

Group dynamics among the youth were important as youth had more fun and contributed to discussions more when they knew each other. With any intervention, group dynamics are pre-existing, but can be influenced throughout the program. Facilitators should be cognizant of the group dynamics as it can affect the participants' buy-in of the program which may affect the implementation process, or implementation may affect the dynamics.

Implementing *UTC* required organizational capacity, as do all programs. To implement *UTC*, an adequate space or setting was needed, which the MAGC facility had the ability to set up each game simultaneously within the same room. Facilitators reported *UTC* could be implemented in a non-traditional setting as long as the setting was conducive to learning (i.e., not too loud or distracting), accessible to youth, and in a safe environment. Additional organizational capacity included time and personnel to update contents to fit the context of the community, recruit youth, and implement *UTC*. While MAGC successfully recruited youth for each session, facilitators commented on the challenges of recruiting youth for irregularly occurring activities. Several facilitators recommended embedding *UTC* into regularly scheduled programs and services, and by partnering with other organizations youth frequently attend.

Though a few challenges occurred, the data revealed MAGC had the organizational capacity to implement *UTC*, a concern associated with many (Demby et al., 2014; Mihalic et al., 2004) and successfully implemented *UTC*. The implementation factors that surfaced during this case study revealed *UTC* implementation is impacted through various ecological level influences, which dynamically connect to, and impact other influences (McLeroy et al., 1988; Moullin et al., 2019). The researchers cannot assume one factor is more or less significant in understanding the implementation process. While MAGC successfully implemented *UTC*, there are several lessons learned that can be gleaned from this study:

1. Advanced recruitment and registration is ideal to distribute the take-home activity, but requires planning and dedicated execution.
2. An organization may have the administrative capacity to implement the program, but needs to dedicate adequate planning and preparation time in advance.
3. Facilitators do not need formal training to implement *UTC*, but facilitator characteristics can influence interactions with youth and perceived relatability.
4. *UTC* offers flexibility in location of implementation, but should be implemented in a safe and supportive environment.

When assessing organizational fit for adoption and future implementation, organizations can use the lessons learned through this study and consider the program structure and associated logistical requirements of *UTC*.

The findings of this study (Chapter III) contribute to the health education field and feasibility literature specifically regarding implementation by identifying key aspects of the implementation process for an innovative program. As implementation science continues to grow through research and practice (Damschroder et al., 2009; Kirk et al., 2016), program developers can contribute during feasibility testing by identifying preliminary outcomes to further assess through full-scale implementation studies.

This implementation study contributes to the field by comparing and contrasting implementation factors for an innovative program that are prevalent among other EBPs. The key factors associated with *UTC* implementation in a rural community-based setting correspond to implementation factors of other teen pregnancy prevention programs including organizational capacity, external factors, and program participants. Thus, confirming the application and significance of these factors to program implementation across various EBPs and communities. Past research shows organizational capacity as a key factor to success of implementation as the capacity is integral to aligning program-organization fit (Demby et al., 2014; Mihalic et al., 2004). In this study, MAGC had the capacity necessary to carry out *UTC*. External factors identified in past implementation studies as barriers include, but are not limited to social norms, recruitment, free-time activities, and transportation (Demby et al., 2014; Hallum-Montes et al., 2016; Kelsey & Layzer, 2014; Powers et al., 2015; Romero et al., 2015). Social norms, culture, and group dynamics all affect participant buy-in and engagement (Hallum-Montes et al., 2016), which was prevalent during *UTC* as youth became more accepting and engaged in *UTC* as they

became more comfortable around each other. Recruitment for *UTC* could improve but will face competition of other free-time activities and require transportation. Future studies can consider incorporating measures to account for the aforementioned factors to gain a deeper perspective of implementation from the organizational and community levels.

This study also provides insight on implementing *UTC*, an innovative sexuality education program, in a rural community. As the sexuality education field lacks evidence-based program options for rural communities (US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2017b), this study gleans meaningful insight on influences for organizations to consider before selecting and implementing a program. The findings demonstrate that while an organization's administrative capacity is integral to implementation (Demby et al., 2014; Kelsey & Layzer, 2014; Mihalic et al., 2004), it is not the only factor to consider when assessing the fit of a program for an organization. This study contributes to program implementation in Tarboro, NC by identifying lessons learned and areas of opportunity for more successful future implementation in their community specifically.

5.2.3. Practicality

The researchers assessed *UTC* practicality through all sources of data (surveys, observations, facilitated discussions, and facilitator interviews). Once all qualitative data was coded and compiled, then compared to the quantitative survey results, 14 themes surfaced within the four primary aspects of practicality; see Table 5.1 (Bowen et al., 2009).

Table 5.1 Practicality Key Themes

Aspects of Practicality	Key Themes from Data
Ability to carry out activities	• Materials and resources • Physical space • Facilitation needs • Program manual
Factors affecting implementation ease or difficulty	• Facilitator background • Program structure • Setting • Community ties/networks
Effects on target audience	• Sexual health knowledge • Skill development • Normalizing sexual health • Modes of learning
Factors affecting implementation efficiency, speed, and quality	• Facilitator role • Time

The ability to implement *UTC* came down to four factors. First, facilitators needed the program materials and accompanying resources. The way *UTC* is packaged accounts for materials and resources needed to implement the games with minimal materials needed from the organization. Second, organizations need an adequate physical space to efficiently execute the games. Depending on the number of participants, the amount of space needed may vary. For this study, the MAGC facility provided sufficient space to set up all games at the same time around the room. Third, facilitation needs varied by game. For the two games less familiar to youth, they needed extra help and guidance from the facilitators to understand how to complete one full round of the game. Last, facilitators required the program manual to lead youth through the games without training. According to facilitators, the program manual "laid everything out" and provided step-by-step instructions to complete each game and move from one game to the next. This manual allowed them to facilitate *UTC* with no training or prior exposure to the program. This is unique to *UTC* as most EBPs require extensive training and organizational inputs (Demby et al., 2014).

Four factors eased *UTC* implementation. The first factor was facilitator background; entailing facilitators that have experience working with youth, are knowledgeable of the community culture, and are relatable to youth (which can include age). While facilitators did not feel they needed a formal training or background in sexual health to implement *UTC*, they identified these factors as enablers to their successful implementation. Second, the program being structured as a set of games naturally captured the youths' attention and kept them engaged. Youth said they liked *UTC* and wanted to keep playing because it interested them and gave them something fun to do. Facilitators also felt the structure provided a fun way for youth to learn in a way that required little from the facilitators; observations indicated this allowed the facilitators to enhance youth experience and learning by incorporating reflection questions. This supports breaking away from traditional, didactic teaching methods to use game-based learning (Blunt, 2006; Haruna et al., 2018). Next, the researchers identified the setting as an enabler to implementation. The MAGC facility provided a quiet and safe environment for youth with limited distractions. It was also a youth-friendly environment (bright colors, pictures of local youth, age-appropriate games and books, etc.) that appeared to make the youth feel welcome and comfortable. This helped keep youth engaged in the games. Last, MAGC and the facilitators appeared to have strong organizational and interpersonal ties within the community. These ties are important to implementation (particularly when preparing for implementation) as two of the games require updating contents to incorporate local resources, also uncommon in other EBPs (Hallum-Montes et al., 2016). As MAGC did not update all materials prior to implementation, these ties allowed them to incorporate local people and resources instantly during the games.

As evidenced by youth through surveys and facilitated discussions, *UTC* had many positive effects on them including, but not limited to increasing sexual health knowledge, skill

development, and normalizing sexual health through a fun modality of gameplay. Youth reported learning most sexual health knowledge, how to identify and access credible sources of information through, effective communication skills and styles, and how to think critically about decisions before acting on them. Through playing these games they also learned the importance of normalizing sexual health and felt the games made them more comfortable with the topic. All the aforementioned effects occurred through playing games. Youth and facilitators both supported the games as a fun way to learn as opposed to didactic teaching. This supports the use of game-based learning programs for youth, which research supports as a more effective teaching mechanism (Blunt, 2006; de Freitas, 2006; Garris et al., 2002; Haruna et al., 2018; Noemí & Máximo, 2014, p.).

The reviewers identified two key factors that affect implementation efficiency, speed and quality: facilitator role and time. The primary role of the facilitators was to guide or instruct the youth, which often involved keeping the youth on task if side conversations took over their focus. However, facilitators naturally used their positions to enhance the quality of learning. They did this by asking reflection and follow-up questions throughout the games to have the youth dig deeper into the content and their beliefs. They also tied in relevant or hot topics they heard recently discussed among the youth or community. Time was also an important implementation factor as each game took various amounts of time to complete. This is particularly important as facilitators should plan adequate amounts of time for games (each at a minimum of 20-30 minutes). However, facilitators should also prepare to capitalize on the flexible *UTC* for implementation sessions, which may vary in lengths of time.

These results contribute to the health education and program development field by identifying factors of a program and its implementation that contribute to making it a practical

option for rural communities. The themes revealed through this study positively support *UTC* as a practical program option for small community organizations in rural areas to teach youth sexual health knowledge and skills. Because of its structure and contents, *UTC* does not require extensive organizational capacity aside from personnel and time for planning, recruitment, and implementation, concerns associated with small organizations and existing EBPs (Demby et al., 2014; Hallum-Montes et al., 2016; Shearer et al., 2005). Organizations can also capitalize on the flexible structure by having facilitators from various backgrounds, implementing the program in nontraditional settings (so long as they are accessible and provide a sufficient space), and consider partnering with organizations they have ties with. The flexible program structure coupled with minimal facilitator background requirements offers a promising sexuality education program that is practical for rural communities. Such factors will also contribute to identifying organizational fit for future implementation and effectiveness studies.

5.3. Discussion

These aspects of *UTC* regarding the acceptability, implementation, and practicality from youth and organizational perspectives provide support for user-friendly implementation in real-world community settings. As a small community organization in a rural town, MAGC praised *UTC*'s modality of GBL and reported *UTC* was a practical option for rural communities to empower youth in the realm of sexual health. The youth appreciated learning sexual health knowledge and skills through gameplay. The unique structure, coupled with a user-friendly manual, enabled MAGC to successfully implement *UTC* with minimal burdens. The flexibility made *UTC* feasible yet personalized to the local community. These feasibility data support the acceptability, implementation, and practicality of *UTC* among youth in Tarboro, NC. See Table 5.2 for an overview of all key themes for *UTC* feasibility.

Table 5.2 Key Themes for *UTC* Feasibility

	Key Themes	Key Themes from Data
ACCEPTABILITY	**Program design**	• Looks like games – fun and educational
	Program/game structure	• Time to complete varied • Sometimes needed examples • Sometimes needed more facilitation
	Learning outcomes	• Sexual health knowledge • Skill development • Resources
	Creating connections with trusted adults	• Building connections takes time; starts with basic trust • Characteristics of adults can make easier/more difficult
	Complexity of talking about sex/sexual health	• Youth don't talk about sexual health • It's hard and uncomfortable to talk about
	Program recommendations	• Want to play with more people • Want to incorporate peer pressure
IMPLEMENTATION	**Program structure**	• Facilitation needs vary by game (because of structure) • Program is flexible and adaptable • Can accommodate varying group sizes • Program naturally engages youth • Program materials were user friendly
	Facilitators	• Facilitator role was primarily to guide • Facilitators did not need formal training • Facilitator role guided by program manual
	Group Dynamics	• Youth have more fun when they know each other
	Recruitment	• Need to recruit enough youth
	Nesting Program	• Recommended nesting within larger programs/services
	Time	• Games need 20-30 minutes minimum • Organizations need to plan for enough time
	Environment	• Adequate space is needed • Social environment can support experience

Table 5.2 Continued

	Key Themes	Key Themes from Data
PRACTICALITY	**Ability to carry out activities**	• Materials and resources • Physical space • Facilitation needs • Program manual
	Factors affecting implementation ease or difficulty	• Facilitator background • Program structure • Setting • Community ties/networks
	Effects on target audience	• Sexual health knowledge • Skill development • Normalizing sexual health • Modes of learning
	Factors affecting efficiency, speed, and quality	• Facilitator role can enhance quality • Time will vary throughout

Current EBPs use traditional didactic teaching formats and lack engaging methodologies, require high organizational capacity and formal facilitator training to follow a rigid format, and are not successfully replicated in new communities (Barbee et al., 2016; Bull et al., 2016; Lindberg et al., 2016; Piotrowski & Hedeker, 2016; US Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Population Affairs, 2017b; Wilson et al., 2017). Results from this feasibility study provide preliminary evidence that *UTC* fills these gaps from an implementation perspective.

Acceptability findings revealed *UTC* provides a fun and engaging modality for youth to learn sexual health knowledge and skills. Implementation results showed *UTC* did not require extensive organizational capacity, a concern associated with most EBPs regarding time and financial burdens (Demby et al., 2014; Shearer et al., 2005). The facilitators' role—supported through a comprehensive, user-friendly manual with step-by-step instruction—was primarily to

guide the youth and therefore did not require formal facilitator training. This made *UTC* practical and filled a critical EBP gap (Demby et al., 2014) for small, rural community organizations that face frequent staff turnover.(Mihalic et al., 2004; Shearer et al., 2005). By not requiring formal training, small organizations can use part-time staff, interns, young adults (including older teens and peers), and volunteers to facilitate the games. Additionally, the flexible and personalized nature of *UTC* allowed youth to play games in any sequence and facilitators to prioritize content by relevancy, rather than sticking to a rigid structure. *UTC* also allows personalization of content to the community, incorporating an ecological perspective. The personalization of *UTC* to local communities enables it to be transferable to a new, diverse community. Overall, the feasibility study showed successful implementation of *UTC* in Tarboro, NC, a rural community, equipping middle-school aged youth with sexual health knowledge, resources, and skills through gameplay without burdening the organization and facilitators.

5.4. Implications for the field

Results of this study support *UTC* has the potential to fill critical gaps in existing program options for rural communities through game-based learning. Research states when designed appropriately, GBL educates through game play and is an effective strategy that enables students to develop, apply, and practice critical thinking skills more efficiently than traditional teaching methods (Blunt, 2006; Haruna et al., 2018; Noemí & Máximo, 2014). The results imply youth learned sexual health knowledge and skills through playing the *UTC* games, supporting its design and application of GBL. Facilitators found the implementation process to be simple, supporting the use of human-centered design (HCD) to develop a user-friendly program. The support of both youth and facilitators coupled with the promising preliminary evidence of *UTC* having a positive effect on sexual health knowledge and skills through minimal

burdens on the organization and facilitators, demonstrates *UTC* is a feasible option for implementation in rural community organizational settings.

5.5. Limitations

The results of this study are subject to its limitations, which include: studying implementation in one community, a small sample size, missing data, and only a few implementation sessions. The limitations warrant the need for future research to further study the implementation process to identify core implementation components, and determine short, intermediate, and long term effects on youth participants. However, these limitations reflect challenges commonly associated with research and program implementation with small community organizations (Hallum-Montes et al., 2016; Powers et al., 2015; Shearer et al., 2005). Thus, future implementation and research should be mindful of time and effort required to complete, and incorporate capacity building assistance to enhance the organizations' capacity, and to execute an implementation study.

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APPENDIX A

DATA COLLECTION MATRIX

Table A.1 Data Collection Matrix

ACCEPTABILITY - How the intended individual recipients react to the intervention. Sample outcomes of interest: 1) satisfaction, 2) intent to continue use, and 3) perceived appropriateness.[4]

Data Tool	Questions	Stakeholders	Research Question
Game Surveys	1 – 10	Youth	To what extent is *Using The Connect* acceptable to youth participants in the Tarboro, NC community?
Program Surveys	1–7, & 13–17		
Facilitated Discussions	1–4, & 9–11		
Observations	1, 4, 5	Youth	

IMPLEMENTATION - The extent, likelihood, and manner in which an intervention can be fully implemented as planned and proposed, often in an uncontrolled design. Sample outcomes of interest: 1) degree of execution, 2) success or failure of execution, and 3) amount, type of resources needed to implement.[4]

Data Tool	Questions	Stakeholders	Research Question
Observations	2, 3	Youth	To what extent can *Using The Connect* be successfully implemented/delivered to youth in a rural community-based organizational setting?
	8, 9, 12–14	Facilitator(s)	
Facilitated Discussions	5 & 6	Youth	
Facilitator Interviews	1 – 5	Facilitator(s)	

PRACTICALITY - The extent to which an intervention can be delivered when resources, time, commitment, or some condition thereof are constrained in some way. Sample outcomes of interest: 1) factors affecting implementation ease or difficulty, 2) efficiency, speed, or quality of implementation, 3) positive/negative effects on target population, 4) ability of participants to carry out intervention activities, and 5) cost analysis.[4]

Data Tool	Questions	Stakeholders	Research Question
Program Surveys	8–12	Youth	How practical is *Using The Connect* for a community-based setting/ organization to teach sexual health knowledge and skills?
Observations	6, 7		
	10–12	Facilitator(s)	
Facilitator Interviews	6–10		
Facilitated Discussions	7 & 8		

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APPENDIX B

DATA COLLECTION TOOLS

Table B.1 Game Survey Questions

Game	Survey Questions	Response Scale
ALL	1. This game was easy to play[5]	SA - SD
	2. The questions were easy to understand[5]	SA - SD
	3. I like the way this game looked[5]	SA - SD
	4. This game was interesting[5]	SA - SD
	5. This game gave me new things to think about[5]	SA - SD
	6. I would play this game again[5]	SA - SD
	7. How much did you learn from this game?[6,7,8]	SA - SD
	8. How much did you like this game?[4-6]	SA - SD
	9. *Question relating to game objectives (see below)*[5-7]	SA - SD
	10. *Question relating to game objectives (see below)*[5-7]	SA - SD
	Questions related to objectives for each game	
MB	9. This game taught me changes that happen to bodies as people grow[5-7]	SA - SD
	10. This game taught me how emotions may change as people grow[5-7]	SA - SD
AI	9. This game taught me how to access credible health information[5-7]	SA - SD
	10. This game taught me where to go for credible health information[5-7]	SA - SD
C	9. This game taught me how to communicate about health-6[5]	SA - SD
	10. This game taught me how to talk about health with different people[5-7]	SA - SD
DM	9. This game taught me to think through decisions before I act[5-7]	SA - SD
	10. This game taught me to think about different options before I make a decision[5-7]	SA - SD

Key for Games
MB = mind and body game, *The Sum of The Parts*
AI = accessing information game, *Tapped In*
C = communication game, *More Than Words*
DM = decision-making game, *Stop • Think • Act*

Response Scale
SA = Strongly agree
SD = Strongly disagree

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Table B.2 Program Survey Questions

Survey Questions	Response Scale
1. This program was easy to play[5]	SA - SD
2. The questions were easy to understand[5]	SA - SD
3. I like the way the program looked[2]	SA - SD
4. The program was designed for people my age[5]	SA - SD
5. The program was interesting[5]	SA - SD
6. I enjoyed playing the games[5,7]	SA - SD
7. The program gave me new things to think about[5-7]	SA - SD
8. The program could help people learn about sexual health[5-7]	SA - SD
9. The program could help people learn how to talk to adults in their community[5-7]	SA - SD
10. The program could help people learn how to access credible health information[5-7]	SA - SD
11. The program could help people learn how to communicate better[5-7]	SA - SD
12. The program could help people learn how to make healthy decisions[5-7]	SA - SD
13. Would you recommend this program to a friend? [5-8]	Yes or No
14. Would you want to participate in this program again? [5-8]	Yes or No
15. Do you think you will use information from the program in the future?[8]	Yes or No
16. In the next three months, who do you think you will talk to about the information you learned in this program?[8]	Open-ended
17. Any other thoughts or comments about the program?	Open-ended

Response Scale

SA = Strongly agree

SD = Strongly disagree

Table B.3 Facilitated Discussion Questions

Questions for Facilitated Discussion
1. What did you think about the program overall?
2. Tell me about your likes and dislikes.[5]
3. Share with me your opinions about the look of each station. Thinking about the pictures, colors, setup, materials, etc.[5]
4. What did you think about the questions and scenarios for each station? Were they relatable? What about the names of the characters?
5. Tell me about the instructions for each of the stations. Were they easy to understand?[9]
6. Tell me about the process of playing at each station. Did you need someone, like a teacher, to help and guide you?[7]
7. Tell me about your thoughts on creating safe connections with adults in your community.
8. Share with me what you think you learned through this program.[7]
9. Would you want to participate in this program again? The whole thing or certain parts?[5]
10. Who would you recommend this program to? Who would you talk to about this program?
11. What is your favorite thing about this program? Least favorite?[5,7]

[9] Orsmond, G. I., & Cohn, E. S. (2015). The Distinctive Features of a Feasibility Study: Objectives and Guiding Questions. *OTJR: Occupation, Participation and Health*, 9.

Table B.4 Facilitator Interview Questions

Questions for Facilitator Interviews
1. Tell me about your experience with this program as a facilitator?
2. Share with me some barriers of this program or implementing it?[10,11]
3. What made it easy to implement this program?[10,11]
4. Tell me about what you felt your role was at each station as the facilitator?
5. Tell me how you think this program could be improved?
6. What resources did or would you need to facilitate this program?[11]
7. Share with me how you think this program affects the participants?[12]
8. Tell me your thoughts on the ideal place/setting for implementing this program?[10,12]
9. What do you think is the ideal way to implement this program? (Think about number of facilitators, participants, etc.)[11]
10. What are your thoughts on recruiting 6 – 8 grade youth for this program?

[10] Bottorff, J. L., Oliffe, J. L., Sarbit, G., Caperchione, C., Clark, M., Anand, A., & Howay, K. (2017). Assessing the feasibility, acceptability and potential effectiveness of an integrated approach to smoking cessation for new and expectant fathers: The Dads in Gear study protocol. *Contemporary Clinical Trials*, *54*, 77–83. https://doi.org/10.1016/j.cct.2017.01.002

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Table B.5 Observation Tool Questions

Questions for Facilitator Interviews
General notes, environment, and arrival:
1. What are the experiences of children as they participate in *Using The Connect*?
2. See room layout and comment about physical setting/environment.[12]
3. What is the process/experience as youth (and their parents) arrive?
Game-specific questions to answer for each game:
4. Do kids appear to be having fun?[7]
5. Do kids appear to understand the instructions?
6. How many kids are actively and continuously engaged in each station?[7]
7. How many kids lose interest? When and how?[7]
Misc. Questions for program and games
8. What factors affected implementation? (Made it easier or more difficult.)
9. How efficient was the physical space for implementation?[12,13]
10. What was the quality of implementation?
11. Were stations implemented in equal amounts of time?
12. Was the facilitator able to implement the program as intended?[13]
13. Did the facilitator (or organization/setting) appear to need additional resources?[13]
14. What was the role of the facilitator during implementation?[6,7]

[13] Hoffmann, T. C., Glasziou, P. P., Boutron, I., Milne, R., Perera, R., Moher, D., Altman, D. G., Barbour, V., Macdonald, H., Johnston, M., Lamb, S. E., Dixon-Woods, M., McCulloch, P., Wyatt, J. C., Chan, A.-W., & Michie, S. (2014). Better reporting of interventions: Template for intervention description and replication (TIDieR) checklist and guide. *BMJ*, *348*, g1687. https://doi.org/10.1136/bmj.g1687

APPENDIX C

DESCRIPTION OF UTC GAMES

C.1. Overview

All four *UTC* games are designed to be played in a facilitated environment with groups of four to six youth per game. Games do not have to be played in a particular order, and participants do not have to complete all content within one game before playing another game. Games can all be played in one day, or can be broken up and played on different days. Youth should begin with playing each game for 20-30 minutes at a time, but can continue playing if they are still interested and engaged in the game. Most games need to be played 3-5 times to completely cover all content, and you can keep track of what content is covered each round, then remove those cards for the next round to prevent repeating content.

Depending on space and preference, organizations can have multiple games going at one time. It is recommended to have two facilitators for every 10-12 youth depending on experience and preference. *UTC* doesn't require a lot of training. The facilitator's role is primarily to go over instructions, make sure the youth stay on task, and answer questions as they come up (they do not need to be experts in sexual health). When gameplay begins, facilitators should begin by giving a brief description of the program, then an overview of each game being played and demonstrate an example of how to complete the games while going through the instructions. Before implementing the program, the organizations should complete planning and preparation work to update contents within *Tapped In* and *Stop • Think • Act* to include local resources and youth-friendly providers.

C.2. Take-Home Activity: *Making Connections*

The take-home activity aims to facilitate conversations between youth and adults to create safe connections with trusted adults in the community. Using a set of conversation prompts and questions, the youth select a card to start a conversation with a selected adult. After the youth asks the adult the first question on the card, the adult then asks the youth the second question on the card to generate a two-way conversation.

Table C.1 Description of Take-Home Activity: *Making Connections*

Making Connections	
Objective	**To make safe connections with trusted adults.**
Description of Tasks	Each youth gets a zipper bag with instructions, conversation cards, safety tips, and contact information card. Overview of instructions for youth: 1. Find a trusted adult to connect with. 2. Pick a card and ask the adult the question on the card. Then the adult asks you the second question on the card for a two-way conversation. 3. Write down the adults' contact info on the contact card to connect in the future if needed. 4. Give the adult the card to talk with other youth in the community.
Example Content	**Connection Card** ***Youth to adult:*** Tell me about a goal you accomplished. How did you achieve it? How did you feel? ***Adult to youth:*** Share with me a goal you have. When do you set that goal? How will you achieve it?
Materials	• Zipper bag • Instructions card • Conversation cards (8) • Safety tips card • Contact information card

C.3. Game: *The Sum of The Parts*

The Sum of The Parts resembles a trivia game and focuses on the mind and body. The youth roll a picture dice, draw a card from the deck matching the image on the dice, and try to answer the question correctly. Two of the card decks focus on anatomy and physiology (penis and related parts, and vagina and related parts), one deck focuses on the mind and emotions, and the fourth focuses on social aspects and interactions youth may experience throughout puberty. For each card the youth answer correctly, they put one of their PlusPlus pieces in the middle to build a structure as a group.

Table C.2 Description of Game: *The Sum of The Parts*

The Sum of The Parts	
Objective	**To learn about changes to the mind and body as you grow/develop.**
Description of Tasks	Overview of instructions: 1. Roll picture dice. 2. Draw a card from the deck matching the image on the dice; pass the card to a neighbor to read out loud. 3. Answer the card question correctly. Topics of card decks: (1) Anatomy and physiology, (2) Mind and emotions, and (3) Social aspects and interactions
Example Content	**Game Card** ***Question for Youth:*** What is the opening of the uterus called? ***Correct Answer:*** Cervix ***Optional Hints:*** 1) Starts with "C," and 2) Sounds like "circus"
Materials	• Game cards (4 decks) • Picture dice • PlusPlus building pieces (8 colors, each in separate containers) • Instructions

C.4. Game: *Tapped In*

Tapped In is similar to the board game Monopoly®. This game helps youth identify credible and reliable sources of information, and practice accessing some sources. The youth pick a playing piece to put on the "Start" space, roll two dice, and move their playing piece that number of spaces; then they draw a card from the deck matching the colored space they landed on and try to answer the question correctly. Each of the four decks of question cards focus on one type of information source including healthcare providers, schools, technology, and community. There is a fifth color space and a corresponding deck of cards that have youth practice accessing various sources of information by completing a Challenge.

Table C.3 Description of Game: *Tapped In*

Tapped In	
Objective	**To identify and practice accessing credible sources of information.**
Description of Tasks	Overview of instructions: 1. Select a playing piece to put on board. 2. Roll numbered dice and move playing piece the number of spaces displayed on numbered dice. 3. Draw a card from the deck matching the colored space the piece landed on; pass the card to a neighbor to read out loud. 4. Answer the card question correctly. **If piece landed on a black/Challenge space, complete the Challenge on the card to practice accessing sources of information. Topics of card decks: (1) Healthcare providers, (2) Schools, (3) Technology, and (4) Community
Example Content	**Challenge Card** In case you ever need to talk to an adult about sexual health, you should practice so you are comfortable. Pick a question from the list below to ask the teacher. After they answer, discuss how they made you feel comfortable. • What is contraception? • What is the most effective way to prevent pregnancy? • How often should you get tested for STIs?
Materials	• Game board (1) • Playing pieces (8) • Dice (2) • Game cards (5 decks) • Instructions • Back-Up Challenge Packet • Smart phone/device **not included in game box**

C.5. Game: *More Than Words*

More Than Words is a two-part game focused on communication skills. In the first part of the game, the youth complete sets of puzzles to define communication skills and communication styles. After completing one set of puzzles, the youth then move through a game board to see different ways a conversation could go based on the communication skills or styles that are used, or not used. Each time they move their game piece on the board, they reveal a piece of the conversation script, reaching a final script at the end of the game board. The youth then rewrite the script in their own words to practice engaging in conversations around sexual health.

Table C.4 Description of Game: *More Than Words*

More Than Words	
Objective	**To identify and practice using effective communication skills.**
Description of Tasks	**Part 1** – Complete puzzles describing 1) communication styles: aggressive, assertive, passive, and passive-aggressive; or 2) communication skills: active listening, empathy, nonverbal communication, and respect. **Part 2** – Similar to a board game. Overview of instructions: 1. Roll colored dice and move playing piece on the same colored path. 2. Draw the cards from the space they landed on and identify what communication skills or styles were used, if any. (*Each space contains cards with parts of a script. The script will develop with each move. The final script will vary by paths taken and communication skills and styles used or not used*.) **Repeat steps 1-2 until reaching a final script. 3. Draw and answer debrief questions. 4. Players rewrite the script in their own words.
Example Content	**Example of Content on Puzzle** ***Active Listening:*** • When you show you understand what someone really means… • Not just hear the words they say, but interpret them; • It requires paying attention to their tone, body language, and message. • Example: "*Your tone seems like you aren't ready to have sex, if that's the case then it's okay. You can tell me.*"
Materials	• Puzzles (2 sets of 4 puzzles) • Game board • Instructions • Playing piece • Colored dice • Script cards • Follow-up question cards • Resource sheet

C.6. Game: *Stop • Think • Act*

The last game, *Stop • Think • Act*, has youth practice problem-solving for a scenario using a decision-making model. They begin by thinking about their options for the scenario, considering the pros and cons of the potential decisions, identify a youth friendly person or provider they could talk to if they were in that situation, and decide what the healthiest decision would be. After coming to a conclusion on the healthiest decision, they then answer various questions to reflect on the decision-making process.

Table C.5 Description of Game: *Stop • Think • Act*

Stop • Think • Act	
Objective	**To think critically about scenarios and problem solve to make healthy decisions.**
Description of Tasks	Similar to a life-size board game. Youth work together as a group to complete. Each youth is assigned a place on the board to begin (and instructions for moving to new sections) based on the number of players. Overview of instructions: • Player in section 1: Draw and read a scenario card out loud. • Player(s) in section 2: Identify different decisions for the scenario. • Player(s) in section 3: Write down the pros and cons for each decision. • Player(s) in section 4: Identify a local youth-friendly provider that youth could talk to if they were in that situation. • Player in section 5: Review the aforementioned pieces and decide what the healthiest decision is. • All participants: Answer discussion questions.
Example Content	**Scenario Card** Hayden has been crushing on Devin for a while. Devin just added Hayden on SnapChat. Their conversations were flirty and harmless at first, but now Devin has been sending Hayden really sexual messages. Hayden has started to feel uncomfortable. What should Hayden do?
Materials	• Game board • Instructions • Scenario cards • Dry erase boards (2) • Dry erase markers (4) • Follow-up question cards • Characteristics of youth-friendly providers cards • Contact information cards

APPENDIX D

TIDIER CHECKLIST FOR UTC

The TIDieR (Template for Intervention Description and Replication) Checklist*
Information to include when describing an intervention and the location of the information

Item #	Item	Where located **	
		Section numbers	Other † (details)
1.	**BRIEF NAME** Provide the name or a phrase that describes the intervention.	1.4 3.1.2 2.1.3.1 4.1.2	
2.	**WHY** Describe any rationale, theory, or goal of the elements essential to the intervention.	1.5 4.1.1 2.1.4 4.1.2 3.1.1	
3.	**WHAT** Materials: Describe any physical or informational materials used in the intervention, including those provided to participants or used in intervention delivery or in training of intervention providers. Provide information on where the materials can be accessed (e.g. online appendix, URL).	3.4 4.3.2.1.1 Appendix C	
4.	Procedures: Describe each of the procedures, activities, and/or processes used in the intervention, including any enabling or support activities.	2.1.3.1 Appendix C	
5.	**WHO PROVIDED** For each category of intervention provider (e.g. psychologist, nursing assistant), describe their expertise, background and any specific training given.	2.2.1 4.2.2 3.2.1.1	
6.	**HOW** Describe the modes of delivery (e.g. face-to-face or by some other mechanism, such as internet or telephone) of the intervention and whether it was provided individually or in a group.	1.5.1 3.1.3 2.2.1 4.1.2	
7.	**WHERE** Describe the type(s) of location(s) where the intervention occurred, including any necessary infrastructure or relevant features.	1.5.1 3.1.3 2.2.1 4.1.2	
8.	**WHEN and HOW MUCH** Describe the number of times the intervention was delivered and over what period of time including the number of sessions, their schedule, and their duration, intensity or dose.	1.5.1 3.1.3 2.2.1 4.1.2	

9.	**TAILORING** If the intervention was planned to be personalised, titrated or adapted, then describe what, why, when, and how.	3.3.1.2 4.3.2.2 3.4	
10.‡	**MODIFICATIONS** If the intervention was modified during the course of the study, describe the changes (what, why, when, and how).	N/A	
11.	**HOW WELL** Planned: If intervention adherence or fidelity was assessed, describe how and by whom, and if any strategies were used to maintain or improve fidelity, describe them.	N/A	
12.‡	Actual: If intervention adherence or fidelity was assessed, describe the extent to which the intervention was delivered as planned.	3.4	

** **Authors** - use N/A if an item is not applicable for the intervention being described. **Reviewers** – use '?' if information about the element is not reported/not sufficiently reported.

† If the information is not provided in the primary paper, give details of where this information is available. This may include locations such as a published protocol or other published papers (provide citation details) or a website (provide the URL).
‡ If completing the TIDieR checklist for a protocol, these items are not relevant to the protocol and cannot be described until the study is complete.

* We strongly recommend using this checklist in conjunction with the TIDieR guide (see *BMJ* 2014;348:g1687) which contains an explanation and elaboration for each item.
* The focus of TIDieR is on reporting details of the intervention elements (and where relevant, comparison elements) of a study. Other elements and methodological features of studies are covered by other reporting statements and checklists and have not been duplicated as part of the TIDieR checklist. When a **randomised trial** is being reported, the TIDieR checklist should be used in conjunction with the CONSORT statement (see www.consort-statement.org) as an extension of **Item 5 of the CONSORT 2010 Statement.** When a **clinical trial protocol** is being reported, the TIDieR checklist should be used in conjunction with the SPIRIT statement as an extension of **Item 11 of the SPIRIT 2013 Statement** (see www.spirit-statement.org). For alternate study designs, TIDieR can be used in conjunction with the appropriate checklist for that study design (see www.equator-network.org).