UNDERSTANDING COMMUNITY STAKEHOLDER PERCEPTIONS OF A SCHOOL SPORTS PARTICIPATION POLICY: A CASE STUDY

A Dissertation

by

SHELBY CAROLINA LAUTNER

Submitted to the Office of Graduate and Professional Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Chair of Committee,	Whitney R. Garney
Committee Members,	John O. Spengler
	Megan S. Patterson
	Adam E. Barry
Head of Department,	Melinda Sheffield-Moore

December 2020

Major Subject: Health Education

Copyright 2020 Shelby C. Lautner

ABSTRACT

Participation in school sports can provide many benefits for students. However, financial strain among school districts and mitigating strategies like the implementation of pay to participate policies, which incur a fee to students to enroll in a sport, have created systems in which participation in school sports is not equally accessible for all students. Across the United States, there are no guidelines for the structure of pay to participate polices, therefore, decisions are left to individual school boards at the community level. The implementation of pay to participate polices is a complex issue that exacerbates health disparities in many communities as it limits access to physical activity. This case study used a mixed methods design to explore elements related to school sports participation, as well as how these phenomena interact with a pay to participate policy. The study used community-based group modeling as a strategy for community based participatory research. This method allowed the researcher to work with community members to understand the complex problem and build systems thinking skills. Findings from this study explain how pay to participate policy can lead to health inequities among students. Recommendations explore how causal loop diagrams and anecdotal evidence can inform potential interventions that make school sports more accessible.

ACKNOWLEDGEMENTS

I would like to thank my committee chair, Dr. Whitney Garney; thank you for being my mentor and pushing me beyond what I thought possible for my life. Thank you to my committee members, Dr. Spengler, Dr. Patterson, and Dr. Barry for their guidance and support throughout the course of this research.

A special thank you to my mentor and collaborator Dr. Scott Grant for being supportive throughout my dissertation and always stepping in when I needed help. Thanks and acknowledgement to my community champions, the Principal and Athletic Director of Springboro High School.

A huge thank you to my family for supporting me every step of the way. Thank you to my mother for always being my soft place to fall and my father for always pushing me towards my dreams and having an unfailing faith in me. Thank you to my younger brother for making me want to be someone you want to be proud of. I love you all.

Finally, thank you to my friends for keeping me humble and sane. To my friends who endured this program with me— I simply could not have done this without you.

CONTRIBUTORS AND FUNDING SOURCES

Contributors

This work was supervised by my dissertation committee consisting of Dr. Whitney Garney, Dr. Meg Patterson, and Dr. Adam Barry of the Department of Health and Kinesiology and Dr. J.O. Spengler of the Texas A&M School of Public Health.

All other work conducted for the dissertation was completed by the student independently.

Funding Sources

This graduate study was supported by a research grant from Texas A&M University College of Education and Human Development. Its contents are solely the responsibility of the author and do not necessarily represent the official views of the Texas A&M University College of Education and Human Development.

NOMENCLATURE

PTP	Pay to participate
ODE	Ohio Department of Education
AD	Athletic Director
CBGM	Community-based group mapping
CBPR	Community-based participatory research
CLD	Causal-loop diagram
SEM	Social-Ecological Model
SES	Socioeconomic status

TABLE OF CONTENTS

Page

LIST OF FIGURES

Page

LIST OF TABLES

Page

CHAPTER I

INTRODUCTION

Study Purpose

The purpose of this case study was to explore systemic barriers to school sport participation in communities. This study assessed the decision-making behind the implementation of pay to participate (PTP) policy and explores health equity in school sports participation. The study also adopted participatory systems thinking strategies that sought to build community capacity.

This study is comprised of five chapters. Chapter I provides an introduction to the topic being studied, the purpose of the study, major research questions, the researcher's scientific paradigm, and theoretical foundation of the study. Chapter II reviews literature about the topic and builds the rationale for study. Chapter III explains the case study design and analytic approach. This includes data collection and analysis, as well as a rationale for why they were selected. Chapter IV reports the study results and answers the research questions. Chapter IV also describes the results using community-based group modeling and discussed details of the emergent causal loop diagram. Finally, Chapter V summarizes and discusses the key insights from the study, the conclusions, limitations, and implications for the field of health education.

Research Questions

To explore this phenomenon, a case study using a mixed methods design was implemented in two phases. Phase I sought to document and explore barriers and facilitators to student sport participation. To understand the PTP in greater depth, the

study explored the decision-making process of key stakeholders involved in the implementation and retention of the PTP policy using a qualitative approach. These phenomena were explored through constructs within the Consolidated Framework for Implementation Research (CFIR). As this study sought to understand "how" and "why" a policy was implemented, a case study using CFIR as a framework was utilized. Constructs in the framework lend themselves to exploring these topics as barriers and facilitators were understood through the constructs *outer setting* and *inner setting* (Damschroder et al., 2009). Decision making was explored through the CFIR constructs *process* and *intervention characteristics* (Damschroder et al., 2009). The following research questions were addressed in Phase I of the study:

1) What are the financial barriers and facilitators to students participating on school sport team(s)?
2) Why do school districts implement and retain pay to participate policy?

Phase I research questions examine factors at an individual and organizational level; however, PTP also impacts the environment and community in which they are implemented (Golden, McLeroy, Green, Earp, & Lieberman, 2015). Therefore, Phase II of the study intended to explore the complex problem using community-based systems modeling. The following research question guided the design of Phase II:

1) How do factors influencing school sports participation interact as a system to impact school sport participation across the community?

By incorporating systems modeling into the study, the interactions between factors related to sports participation can be better understood. This understanding helps to

identify new and innovative strategies for making sports participation more equitable in the community.

Scientific Paradigm and Approach

The researcher used a constructivist paradigm to execute this study. The constructivism paradigm considers "reality [to be] socially constructed" (Mackenzie & Knipe, 2006, pg 196). Social construction implies that experiences and knowledge are produced and reproduced within the community being studied and are uniquely true for that particular environment (Appleton & King, 1997). Study findings represent the views of the participants and emphasizes the social context to understand the importance of "place" (Macintyre, Maciver, & Sooman, 1993, pg 213). Constructivism is the notion that realities are intangible, mental constructions (Guba & Lincoln, 1994). These constructions are socially based and specific to the groups holding them (Guba & Lincoln, 1994). This scientific paradigm influenced the research design, execution, and interpretation of results of this study.

In order to conduct the study, a community-based participatory research (CBPR) approach was used. CBPR was used to equitably collaborate with members of the community in an effort to create a shared understanding of the health problem and study findings (Satcher, 2005, pg.5). This approach allowed researchers to integrate education and social action to improve health and reduce health disparities (Wallerstein & Duran, 2006). CBPR also allows information to be disseminated to community stakeholders who can use the information to make environmental and program changes locally (Garney et al., 2015). Several principals of CBPR apply to this study in that it recognizes

a community as a unit of identity, it facilitates collaborative and equitable partnerships, and it emphasizes the local relevance of public health problems and ecological perspectives (Israel et al., 2019).

The CBPR strategy used in this study is community-based group modeling. Community based group modeling (CBGM) is a method for involving stakeholders in the process of exploring, understanding, and changing systems (Hovmand, 2014). CBGM can also be used as a tool used in decision making and can help stakeholders mobilize strategies when addressing a local problem (Hovmand, 2014). Not only does the model have the ability to mobilize community members, but it can increase awareness, capacity, and motivation for continued efforts for group model building (Hovmand, 2014). Group modeling is a strategy helps participants gain insight into the structure and behavior of a system; in this case their community and how it interacts with a policy (Andersen, Richardson, Vennix, 1997). This activity was leveraged as a strategy for CBPR by equitably collaborating with community members and creating a shared understanding of PTP in the community (Satcher, 2005, pg.5).

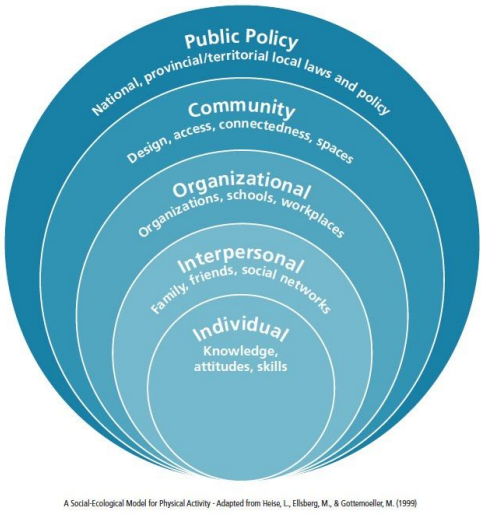
Aligned with CBPR principals, this study also worked to build community capacity. Specific aspects of community capacity that group modeling can enhance includes participation and leadership, sense of community, shared understanding of community history, and critical reflection (Goodman, Speers, & McLeroy, 1998). This participatory systems thinking strategy increases shared knowledge and systems thinking skills. Building community capacity is important because it can foster skills and relationships among community members that allows them to act on existing concerns

from a grassroots perspective (Cavaye & Cavaye, 2000). CBGM is focused on the process of engaging and learning with the community; through this, skills can accumulate, and later projects can be driven by community members (Hovmand, 2014).

Theory

The study utilized the social ecological model (SEM) framework and systems perspective to understand influences on the health problem. A graphic depiction of this framework is shown in Figure 1. Understanding a complex problem from various levels of the social ecology helps researchers conceptualize the scope of the phenomena being studied (McLeroy, Bibeai, & Steckler, 1988). The framework addresses how targeted efforts can promote changes at the individual, interpersonal, organizational, community, and policy levels (McLeroy, Bibeai, & Steckler, 1988). The SEM also accounts for the interactions and relationships between factors within each of the levels (Langille & Rodgers, 2010). When combining the ecological and systems perspective the researcher was able to examine the complexity of the problem and understand how elements in the system interact (Peters, 2014). Using a social-ecological perspective can also target interventions at specific levels (Gregson et al., 2001).

Figure 1: Social ecological model



A systems perspective allows a deeper understanding of the nature of things and see how we can intervene to improve people's health in new ways (Peters, 2014). Adopting a systems perspective means encompassing the whole picture, a broader context, considering interactions among multiple levels, considering changes in the system that occur over time, and collaborating with stakeholders from various disciplines (Sim, Parker, & Kumanyika, 2010). By exploring a system, the researcher was able to see how the system works and how we might be able to change it, which is important in reducing health inequities (Peters, 2014). Systems thinking allows for the use of tools to facilitate a common understanding of an issue and then prompt action (Peters, 2014). In combination, the SEM and systems perspective explored the health problem on specific levels, then sought to understand how elements within the levels interact in complex ways. This study investigated how a policy was viewed by a community on various levels which included: interpersonal (students and parents, students and teachers, coaches and students), organizational (school), and community levels of the SEM.

CHAPTER II

LITERATURE REVIEW

To investigate and summarize key information about access to sports participation, a narrative literature review was performed to inform this study. The purpose of using a narrative literature review technique is to gather relevant information from multiple databases about the topic being studied, then through a synthesis of information, gaps in the research topic are able to be identified (Griffith University, 2020). Through this literature review technique, gaps in our understanding of PTP were revealed (e.g., what the decision making process is when implementing a PTP policy).

To meet the recommended amount of exercise to sustain a healthy lifestyle, many students participate in school sports (Neely & Holt, 2013). According to the 2017 Youth Risk Behavior Surveillance Survey results, more than half (54.3%) of high school students surveyed participated in at least one school sport within the last year (Centers for Disease Prevention and Control, 2018). The benefits of participating in school sports are well researched and include increased physical activity and fitness, mental health benefits, positive youth development, increased perceptions of family, teacher, and community support, and reduced risk behavior (Eime, Young, Harvey, Charity, Payne, 2013; Van Boekel et al., 2016). Further research has found school sport participation can protect individuals from poor mental health in early adulthood (Jewett et al., 2014). Not only does the participation in sport during one's youth have short-term benefits, but research has shown that participating in a sport could contribute to higher earnings as an adult (Zdroik & Veliz, 2016).

Pay to Participate Policy

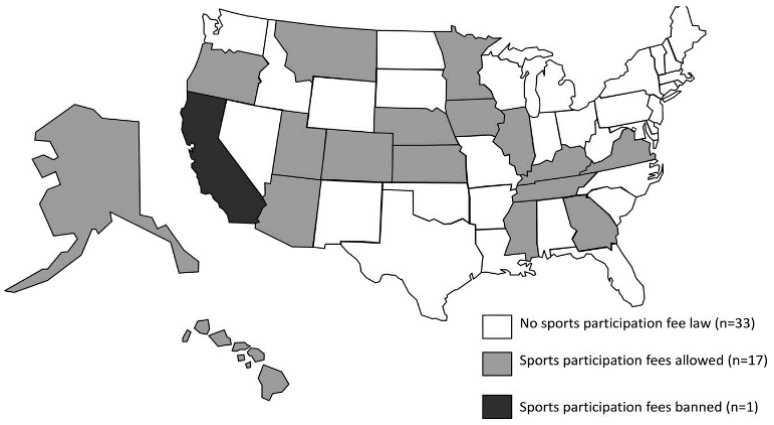
Despite the known benefits of participating in school sports, they are not accessible for all students (Holt, Kingsley, Tink, & Scherer, 2011). The socioeconomic status of a student can limit their ability to participate in school sports due to cost (Burkhardt, 2016; Bucy, 2013; Holt, Kingsley, Tink, & Scherer, 2011). Costs associated with sport participation include uniforms, equipment, travel, coaches, and practice locations. As opposed to absorbing sport participation-related costs, many school districts seek to supplement their budgets with athletic fees (Burkhardt, 2016). A study completed by the C.S. Mott Children's Hospital found that 1 in 7 parents whose children did not participate in sports cited cost as the reason during the 2013-2014 academic year (C.S. Mott Children's Hospital, 2015). Findings from the same study discovered that over 60% of children surveyed who play school sports were required to pay an athletic fee and 18% of those parents paid more than $200 (C.S. Mott Children's Hospital, 2015). High costs associated with participating in school sports affect participation rates (C.S. Mott Children's Hospital, 2015). Youth who belong to diverse populations and low-SES youth are at a higher risk for becoming overweight, and according to one study, experience disparities in sports participation rates (Johnston, Delva, & O'Malley, 2007). This could lead to experiencing health disparities in adulthood.

Organizational Influence and Implementation

Pay to participate (PTP) policies are organizational school policies that allow for the collection of fees from student-athletes in order to participate in extracurricular activities (Eyler, Piekarz-Porter, & Serrano, 2019). PTP policies incur a fee from

students charged as either a flat amount per year, per sport, or a variable charge by sport (C.S. Mott Children's Hospital, 2015). These policies are implemented in times of budgetary constraint because schools tend to prioritize academics over extracurricular activities, as they are seen as extraneous (Eyler, Piekarz-Porter, & Serrano, 2019). In order to maintain sports programs rather than eliminating them altogether, school districts use PTP policies to supplement program funding (Hoff & Mitchell, 2006; Rausch, 2005). Past literature has established that implementation of PTP is a "bittersweet alternative," in that, the policy, at the very least, separates funding for sports programs from the local voting body (Rausch, 2005, pg. 39). This means that the policy creates a separate funding source that is not reliant on voters approving tax levies. However, because public schools are funded by the local tax base, the examination of PTP policies raises the question, what should be included in a free public education (Rausch, 2005)?

Figure 2: National pay to participate landscape; Reprinted from Eyler et al., 2019



As an alternative to paying the PTP fee, some school districts implement waiver programs based on family income (Alexander, 1997; Eyler, Piekarz-Porter, & Serrano, 2019). These programs can be helpful because disparities in sports participation rates exist for low SES students (Johnston, Delve, & O'Malley, 2007). However, waiver

programs do not always overcome cost barriers to participation because low SES families may not want to reveal their financial status (Eyler, Valko, & Serrano, 2018).

The structure of PTP varies depending on the school. However, a 2016 study found that 18 states have laws that govern sports participation fees, in which 17 states specify that policies should be dictated by school district (Eyler, Piekarz-Porter, & Serrano, 2019). This means that most states allow independent school districts to determine policy structure and costs (Eyler, Piekarz-Porter, & Serrano, 2019). A depiction of the policy landscape in the U.S. can be found in Figure 2.

Need for Understanding and Investigation

Cost of a PTP policy can limit participation in school sports (Burkhardt, 2016; Holt, Kingsley, Tink, & Scherer, 2011; Park, Eyler, Tabak, Valko, Brownson ,2017; Eyler, Piekarz-Porter, & Serrano, 2019). In contrast, the policy could also ensure sport programs in public schools are offered (Hoff & Mitchell, 2006; Rausch, 2005). This varied impact raises a need for investigation of the benefit of PTP policies. A perspective not yet examined in the published literature is that of the community, and how community members view the impact of a PTP policy on school sport participation on health disparities.

To promote physical activity and health, it is important for health education researchers to know what resources exist in a community, as well as the barriers (Robinson, Driedger, Elliot, & Eyles, 2006). PTP could be a barrier as it has been established that high cost of sports may lead to disparities in sports participation (C.S. Mott's Childrens Hospital, 2015; Johnston, Delva, & O'Malley, 2007). This barrier

could exacerbate an already high obesity rate. Understanding the decision-making behind policy making can help researchers and practitioners determine what factors lead to the implementation of a PTP policy. Decision making is important to consider in policy because it would lead to passing policies for which impact has been taken into account (Elmore, 1979). Although the impact of PTP has been observed through a few studies, the decision-making process is not yet well understood (Eyler, Piekarz-Porter, & Serrano, 2019; Eyler, Valko, & Serrano, N, 2018; Burkhardt, 2016; Hoff & Mitchell, 2006; Grant, 2017).

CHAPTER III

METHODS

This study used a case study approach to explore the effects of Pay to Play policy on sport participation. A case study is an ideal method because the purpose of this study was to explore "how" or "why" a phenomena occurs (Yin, 2017). Case studies are also useful for answering research questions that require an "in-depth" understanding of a social phenomenon (Yin, 2017). In this case study, the community is the unit of analysis, and historical and empirical evidence are used to inform the research questions. The study is exploratory in nature (Yin, 2017). This case study used a mixed-methods design which incorporated both historical and empirical evidence and was completed in a two-phase process. Mixed methods are commonly used in case studies and the social sciences and involves collecting two types of data—qualitative and quantitative (Small, 2011, pg. 57).

Qualitative methods are appropriate because they provide a rich understanding of program evaluation, policy analysis, and experiential phenomena (Patton, 1990; Giacomini & Cook, 2000). To draw conclusions using qualitative methods, the researcher seeks to find meaning in the data through patterns and common themes with participants (Miles & Huberman, 1984). This methodology is appropriate for a constructivist paradigm. Another conclusion that can be found through qualitative methods is fruitful, contextual explanations that include a local perspective (Miles & Huberman, 1984). Utilizing a qualitative methodology to explore research questions can provide rich insight into the perceptions of barriers and support systems for school sport

participation and the decision-making processes that impact it (Goins, Williams, Carter, Spencer, & Solovieva, 2006). Key informant interviews were used to collect qualitative exploratory data to understand beliefs prominent within the community (Tremblay, 1957). Archival documents and financial data, which are publicly available, were used as quantitative sources of data to supplement the qualitative data.

The study was conducted in two phases. Phase I focused on identifying barriers and facilitators related to school sports participation, and the decision-making process behind the implementation of PTP policies. Understanding decision making is key to explore factors related to the implementation process (Damschroder et al., 2009). Phase II sought to understand how the community perceives the impact of such policy and school sports participation from a systems perspective through a group modeling activity. As physical activity and barriers to school sport participation are complex problems, a systems perspective can attempt to understand and conceptualize these problems because it accounts for multi-level interactions (Brennan, Sabounchi, Kemner, & Hovmand, 2015).

Study Setting

This study was conducted in partnership with community stakeholders using a community based participatory research (CBPR) approach. CBPR requires existing relationships with the community being studied (Berge, Mendenhall, & Doherty, 2009). In CBPR, it is also important for the questions being asked by the study to be questions the community wants answered as well (Mosavel, Simon, Van Stade, Buchbinder, 2005). For these reasons, this study was conducted in Springboro, which is in Warren

County, Ohio. The researcher had an existing relationship with community stakeholders in Springboro, which makes the CBPR approach an ideal method of engagement and the school board wanted to explore PTP as they prepare for new property tax legislation (Berge, Mendenhall, & Doherty, 2009).

Springboro, Ohio has a population of 18,931 people (U.S. Census Bureau, 2019). There are no state-level policies in Ohio to govern the allowance or restriction of sports participation fees (Eyler, Piekarz-Porter, & Serrano, 2019). Findings from a review of gray literature show that Ohio school districts more commonly have PTP policies and are frequently more expensive when compared to other states, suggesting an Ohio community as an important site for inquiry (Lautner, Eyler, & Spengler, 2019).The school district in Springboro has the highest PTP fee in the major metropolitan area (Dayton Daily News, 2019). Additionally, according to County Health Rankings, Warren County has a 4% higher rate of physical inactivity in comparison to the rest of the country (24% vs. 20%; County Health Rankings, 2018). Warren County also has a higher rate of adult obesity when compared to the U.S. overall (31% vs. 26% adult obesity rate; County Health Rankings, 2018). In combination, these factors make a case for ensuring children have equitable access to physical activity.

In March 2020, the initial communication phase began and the researcher began building a relationship for ongoing collaboration with the Athletic Director and Principal – an important step in the CBPR process (Castleden, Morgan, and Lamb, 2012). The community's population is comprised of primarily White individuals (92.4%). Other diverse populations in the city include Black and African American individuals, Asian,

and Hispanic or Latinx (1.8%, 1.8%, and 1.9% respectively; U.S. Census Bureau, 2019). The school district student population mirrors the community in that it is primarily White students (91.1%), 2.1% of students are Black or African American, 3% of students are Asian, and 1.6% of students are Hispanic or Latinx (Ohio Department of Education, 2019). It is also important to note that 7.2% of students are considered disadvantaged by the state education department (Ohio Department of Education, 2019). According to the 2019 U.S. Census data, 5.2% of the population is considered to be living in poverty. Disadvantaged students, according to the Ohio Department of Education (ODE), are defined as students who are known to be eligible for free and reduced lunch, students whose parents or guardians are known recipients of public assistance, or students whose parents or guardians have completed Title I students income form (Ohio Department of Education, 2019). While the study does not take place in a disadvantaged area, the high PTP fee and high obesity rate warrant investigation and tailored strategies to promote participation in sports.

Phase I Methods

Phase I of the study explored barriers and facilitators to student's participation in school sport teams, as well as why decision makers in school districts decided to implement and retain a PTP policy. These topics were examined using semi-structured key informant interviews, as well as a secondary analysis of archival documents such as school policies, memos, and handbooks. Qualitative data collected includes key informant interviews and archival document reviews. Quantitative data was accessed from the school district's archival financial data. The case study methodology provides a

mechanism to combine these data sources and inform the research questions (Johnston, 2004). The specific research questions in phase I of the study were:

1. What are the financial barriers and facilitators to students participating on school sport team(s)?
2. Why do school districts implement and retain pay to participate policy?

Key Informant Interviews

Key informant interviews were used to investigate why the PTP policy was implemented were developed using the Consolidated Framework for Implementation research (CFIR; Damschroder et al., 2009). Each of the questions asked correspond to a particular domain within a CFIR domain. The CFIR domains used in this study include: 1) the intervention (PTP policy) characteristics, 2) outer setting (the community). 3) inner setting (school organization), and 4) process of implementation (decision making). Investigating PTP decision making through CFIR is useful because it provides a framework for understanding why PTP implementation occurred through defined constructs.

Qualitative Data Collection was conducted by the study's principal investigator using semi-structured key informant interviews. All interviews were conducted over the phone and notes were taken during the interviews to capture information and key insights. Each interview lasted between 30 and 50 minutes. Prior to the interviews, the participants were emailed the informed consent document. Consent was given verbally over the phone before data collection. The researcher asked the same questions of all

participants in order to increase comparability (Israel et al., 2005). Questions asked during the interview were:

Questions 1 through 10 sought to gather information about the history and implementation of the PTP policy, these questions inform the CFIR constructs *policy characteristics, process,* and *inner setting* (Damschroder et al., 2009). The questions investigated when and why the policy was implemented, then what that process looked like. This part of the interview also explored what other cuts may have occurred in the district such as bussing or faculty cuts. Next, the questions asked about the PTP policy specifically: how the policy has changed over time, if a waiver program exists, how the collected funds are allocated, and if there are any metrics associated with the policy.

Questions 11 through 13 asked about the community perspective, which informed the *outer setting* CFIR construct (Damschroder et al., 2009). These questions asked what the community response has been like, positive, negative, or neutral. Finally, questions 14 through 16 asked about the perceived impact, these questions informed the CFIR construct *process* (Damschroder et al., 2009). Questions asked to understand perceived impact were if key informants thought that the PTP policy impacted low SES students or female student athletes and if they have seen any other changes in the school since PTP implementation. Decision making was assessed through CFIR because it provided a rich understanding of why and how PTP was implemented. The interview guide and a crosswalk table of all constructs used from CFIR can be found in the Appendices (Appendix A: Interview Guide; Appendix B: CFIR Construct Crosswalk Table). The interview guide was pilot tested with PTP policy experts and community

health researchers in the health education research field prior to collecting data (N=4). The tool has been approved by the Texas A&M University Institutional Review Board (IRB2019-0955).

Archival Documents

A content analysis of archival data was completed to gather understanding of the PTP policy and the experience of student athletes in the community of interest that are impacted by policy enacted. Archival documents were accessed through a search of local news sources online and searching through the school's documents. This search was done through Google. Links to articles about the community and the surrounding area were selected. The school's website was also used to collect documents about the athletics program, memos about the PTP fee, and documents for student athletes. The gathering of archival documents began in March 2020 and ended in June 2020. Once gathered, the documents were stored in a database that was on a personal computer that is password protected and only accessible by the principal investigator. All relevant documents were free and accessible to the public. Due to the ever expanding source of online information archival data can add knowledge to a study through capturing ideas and information unable to be captured through participant data (Heng, Wagner, Barnes, & Guarana, 2018). Historical and archival data was gathered to perform a content analysis which allows the researcher to explore the student experience of sports participation and pay to participate. Content included in analysis were items that directly related to the community and school being studied. An article or archival document that spoke to PTP from a national or state-wide level were excluded from the analysis. In

total, nine (N=9) items were analyzed. Items collected for the content analysis included news articles, the student athlete handbook, school memos, forms about pay to participate, and a form for a fee payment plan if a student qualified for free and reduced lunch.

Archival Data Collection helped determine what happened leading up to the policy implementation and thereafter. Archival data including sport rosters from a range of years, memos released about PTP policies, news articles, and student athlete handbooks, which was publicly available from the schools and local news sources, were examined. Quantitative information was also accessed from the Ohio Department of Education (ODE) from 2007 to 2019 (Ohio Department of Education, 2018). The ODE data included demographic, financial, and enrollment data for all Ohio school districts (Ohio Department of Education, 2018). This data was used to identify financial information and enrollment numbers for the identified district. Together, these two sources of data provided information about factors that may have attributed to the implementation of the PTP policy and the observed outcomes.

Financial Information

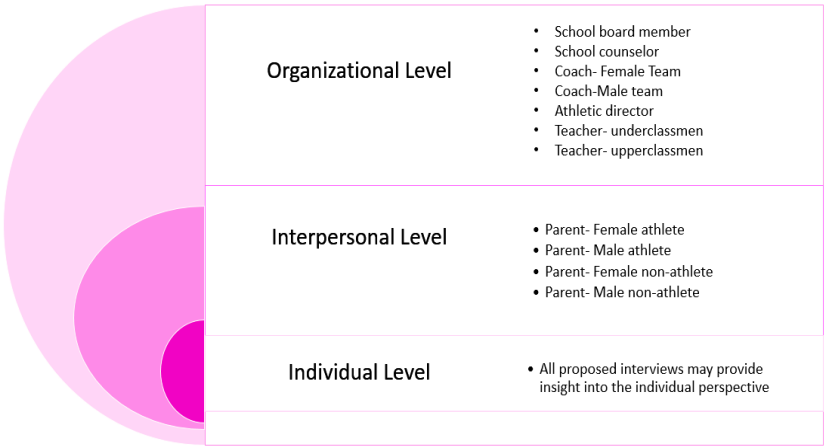
In addition, school district financial data from 2007 to 2019 were collected to capture economic factors that may have drove the need for implementation of a PTP policy. The financial data included information about how the school was funded, at what amount it was funded, and how the funds were used (Ohio Department of Education, 2020). It provided figures on local tax contributions, state funding contributions, how much was spent per pupil, what the average salaries of teachers were

per year, and demographics of the students (Ohio Department of Education, 2020). It also provided information on a similar school district to the school that is the subject of this study (Ohio Department of Education, 2020). These financial data were accessed in June 2020 on the ODE website. One file was downloaded for each year included in the analysis (N=12 files). Once downloaded, they were stored on a private computer which was password protected and only accessible by the principal investigator. These data were available on the ODE website and is available free to the public. The data gathered was meant to show what the school funding climate was like leading to the implementation of the PTP policy and the years following.

Participant Recruitment

To recruit individuals to participate in the study (key informant interviews and subsequent CBGM activities), snowball sampling methods were used. Snowball sampling is a procedure in which a sample of individuals is drawn from a finite population, then members of the pooled sample are asked to name other individuals they believe the researcher should interview for the study (Goodman, 1961). The study's sampling strategy was

Figure 3: Recruitment by SEM level



designed to target important sectors related to the phenomena studied (Boddy, 2016). The sampling strategy also ensured that key informants with varying knowledge and experiences with PTP are recruited to the study (Travers et al., 2008). The diverse stakeholders group were also meant to provide different perspectives based on the levels of the SEM, this categorization is shown in Figure 3.

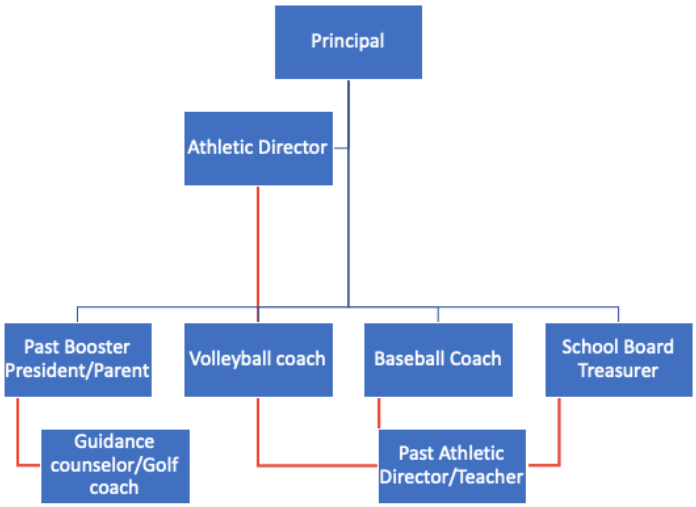
Snowball sampling was able to ensure all key representatives were included in data collection, which the researcher could not have accomplished externally (Sullivan, et al., 2001). In snowball sampling, patterns among referrals emerged which indicated where an individual exists within a network and how embedded they are (Noy, 2008). Patterns such as these can indicate social groups and mutual relationships (Thompson, 2002). These individuals are often important sources of knowledge to inform the study (Noy, 2008). The sampling strategy was designed to acquire diverse stakeholder perspectives including school administration, sport program administration, school staff, coaches, teachers, and parents. A breakdown of the various sectors and representatives can be found in Table 1 below.

Table 1: Sectors Represented in Sample

Interviewee	**Sector**
Athletic director	School/ Administration
School board member	Administration
Coaches (Male & Female)	School/ Students
Teachers (Upper Classmen & Under Classmen)	School /Students
School Counselor	Students
Parents	Students

To conduct the snowball sampling, the researcher started by recruiting the identified stakeholders provided in Table 1 and continued recruiting until the same participants were being suggested multiple times and no new people emerged. In order to recruit the initial group of individuals for the study, the researcher collaborated with the Athletic Director and the high school Principal. The Athletic Director (AD) served as a community champion to aid the researcher in identifying key stakeholders who could provide insight into the phenomena being studied using the snowball sampling method (Andrews et al., 2012; Goodman, 1961). Once an interview was completed with the AD, the researcher was connected with a variety of key stakeholders. A depiction of the key stakeholders recruited through snowball sampling is shown in Figure 4. In Figure 4 the red lines represent links to stakeholders who were recruited through secondary levels of the snowball sampling process. These stakeholders were either highly connected members of the network (past athletic director/teacher) or someone who was thought to be a key individual to interview by another interviewee (guidance counselor/golf coach).

Figure 4: Snowball sampling process



In total, the researcher interviewed eight (N=8) key informants, however, because this study takes place in a school setting, multiple informants were able to speak about PTP and school sports participation from multiple perspectives. During the sampling process, the past AD was revealed as a key informant highly embedded in the network. This finding was based on the high number of links to other network members (n=3), as seen in Figure 4. This individual had both historical knowledge about why the policy was implemented, how PTP was implemented, and how it has changed over the last decade. Another referral to highlight is the guidance counselor/golf coach from the past booster president/parent. The individual who referred the guidance counselor/golf coach believed they were important to the study because they could provide information from two perspectives: 1) the experience of student athletes who are on their team, and 2) the experience of non-athletic students who the guidance counselor works with throughout the school day.

Data Analysis

Data analysis in Phase I was completed in two steps. First, each source of data was analyzed independently. Next the qualitative data and archival data were combined and viewed together. In a case study, this process is referred to as data triangulation (Carter, Bryant-Lukosius, DiCenso, Blythe, & Neville, 2014; Johnstone, 2005). Data triangulation is used to develop a comprehensive understanding of the phenomena (Carter, Bryant-Lukosius, DiCenso, Blythe, & Neville, 2014).

Qualitative Data Analysis of interviews was completed using NVivo software and a closed coding scheme, dictated by the CFIR constructs (Damschroder et al., 2009;

QSR International, 2019). NVivo software allows the researcher to sort data by themes and attributes, then create outputs reports of the results (QSR International, 2019). By using this software for qualitative analysis, the researcher identified common themes across the interviews. CFIR was used to guide data analysis and its domains and constructs were used to build the coding scheme in NVivo (Damschroder et al., 2009; Garney et al., 2018). A list of the domains and constructs used for data analysis can be found in Appendix B. Data analysis ended once data saturation was met through the interviews (Fusch & Ness, 2015). In qualitative data collection, data saturation is determined when no new information is provided in interviews (i.e., the same content is repeated in subsequent interviews, Fusch & Ness, 2015).

To ensure interrater reliability, multiple coders were enlisted (Tinsley & Weiss, 1975). The data were analyzed by two trained qualitative researchers. The researchers first reviewed and coded the data individually. Once this was completed, the coders met virtually to review their codes, themes, and interpretations of the data and performed an audit so that inter-rater reliability could be determined (Garney et al, 2018).

Archival Data Analysis was conducted in two parts. First, archival documents were analyzed using a content analysis (Mayring, 2004). Content analysis was useful for examining communication materials including the school's student athlete handbook, memos about the PTP policy, and news articles (Mayring, 2004). The archival documents were analyzed using a content assessment tool that captured key information about barriers and facilitators of school sport participation (Lautner, Patterson, Ramirez, & Heinrich, 2020). The tool used was programmed into Google Forms and used to

extract key information about why the PTP policy was implemented and retained. A copy of the tool can be found in Appendix D. Key information captured by the tool included if it was a news or school document, the year the item was published, if it mentioned low income students, notable quotes that provided insight into the community's perception of pay to participate, and if the tone appeared negative (opposed to fee), positive (in support if the fee), or neutral (no obvious stance). Information learned from these materials include specifics about the PTP policy, rules for students, if there is a waiver program, and if the community has an opinion or view about the policy as relayed in local news outlets. The information informed the study by providing context and detail to the PTP policy. The findings also provided insight into the student's experience through the analysis of the handbook.

To analyze financial data from the Ohio Department of Education, financial trend graphs were created in Microsoft Excel (Boginski, Butenko, & Pardalos, 2005). Financial trend graphs document activity over time and depict structural properties that are associated with the topic being studied (Boginski, Butenko, & Pardalos, 2005). The Ohio Department of Education collects financial data from each school district in the state every year. Items in the data set included information about the number of students enrolled, the number of full-time teachers employed, local tax information and contribution, the amount spent on each student, and comparisons to a similar district. For this study, financial data from 2007 to 2019 was collected and key variables from the larger data set were placed into a new data set used for analysis. Variables in the data set for analysis were pupil density, percentage of disadvantaged students, number of

classroom teachers, average teacher salary, local tax effort index, local tax effort index for a similar district, total tax per pupil, total expenditures per pupil, and total expenditures per pupil for a similar district. The cost of the pay to participate fee for each year was also included to show how the fee fluctuates with economic trends.

Data Triangulation combined the three sources of information to document barriers and facilitators to sports participation, as well as the decision making for PTP policy implementation and retention. Triangulation is necessary to test the validly of data through a convergence of different resources (Carter, Bryant-Lukosius, DiCenso, Blythe, & Neville, 2014). Data triangulation is also a common strategy used in mixed methods case studies (Johnstone, 2004).

Phase II Methods

Information learned in Phase I of the study informed Phase II. In Phase I, key stakeholders and the researcher documented key factors in PTP policy and factors contributing to school sports participation. These findings informed Phase II, which created a shared understanding of the interactions and interrelationships of the systems using community-based group modeling. The following research question guided the methods for data collection and analysis in Phase II:

2) How do factors influencing school sports participation interact as a system to impact school sport participation across the community?

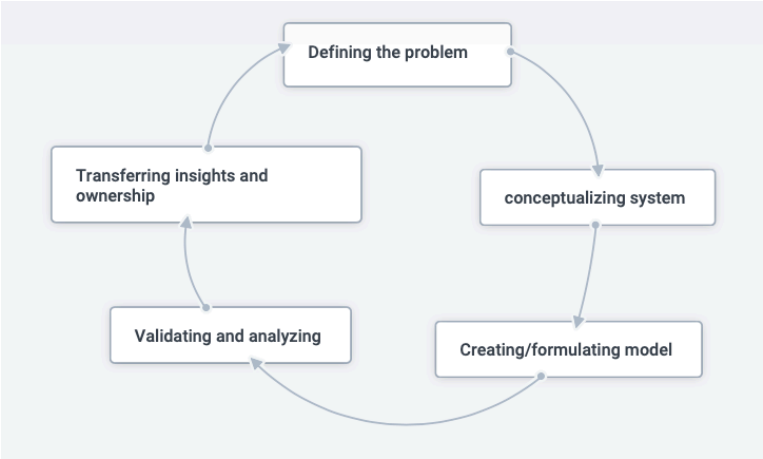
As expressed in the theoretical section of Chapter I, understanding a complex problem from various levels of the social ecological model can help researchers conceptualize the scope of the phenomena being studied (McLeroy, Bibeai, & Steckler,

1988). In Phase II of the study, a system thinking perspective was adopted to conceptualize the ecological factors identified in Phase I of the study. Systems are also useful for addressing complexity because the visual of a systems map represents a simplification of a complex problem (Williams & Hummelbrunner, 2010).-As physical activity and disparities in school sport participation are complex problems, systems thinking can attempt to understand and conceptualize these problems because it accounts for multi-level interactions (Brennan, Sabounchi, Kemner, & Hovmand, 2015). To create a visual graphic depicting community stakeholder perspective, community-based group modeling was used (Hovmand, 2014). A visual representation facilitates a holistic representation of a problem, whereas words tend represent a linear order of a problem, but with visuals (Meadows, 2008).

Community-Based Group Modeling

In order to build a systems perspective of a phenomena, a diverse group of stakeholders must identify a bounded topic, then work together understand the interrelationships and interdependence of included elements (Williams & Hummelbrunner, 2010). Community-based group modeling (CBGM) is a strategy for

Figure 5: CBGM process; Hovmand, 2014



involving stakeholders in the process of exploring, understanding, and changing systems (Hovmand, 2014). CBGM was used to create a visual systems graphic depicting

Figure 6: Case study causal loop diagram building process

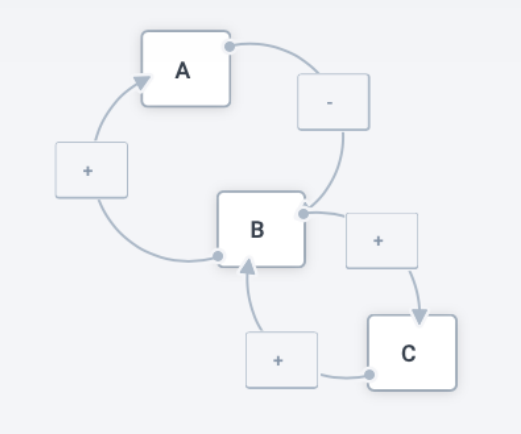
community stakeholder perspectives (Hovmand, 2014). A visual representation is necessary because words represent a linear order of a problem, but with visuals, all parts of the problem can be viewed at once to create a better comprehension (Meadows, 2008). An overview of the modeling process adapted from Hovmand (2014) is shown in Figure 5. This methodology lends itself to viewing the complex problem from multiple perspectives. It is important to consider the boundaries of the system (Midgely, 2006; Williams & Hummelbrunner, 2010). Boundaries determine what is included in the model and excluded (Midgely, 2006). Defined boundaries are necessary because they dictate who or what factors can be influenced by manipulations in the model (Midgely, 2006). Boundaries for the model were determined by the researcher and include: factors directly impacting the community related to school sports.

For this project, the researcher collaborated with stakeholders that completed interviews during Phase I in the modeling process. The aim was to engage community members and co-create a model that could spur insights and targeted recommendations. The process of CBGM can advocate for positive change, which in this case is increased access to sports for public school students (Hovmand, 2014).

Model Building Activities

To begin the modeling process, the researcher created "core loops" using data gathered during the key informant interviews. For this, an online software called Plectica was used. Plectica is used to diagram complex systems and other system structures (Plectica, 2020). Figure 7 depicts an example of a core loop where "A" and "B" are factors that balance one another and "B" and "C" are factors that reinforce one another. The core loops consist of factors that persist and drive the system (Acumen, 2019). The core loops were combined in a causal loop diagram that further built out the model based on themes identified during key informant interviews Phase I. Causal loops diagrams (CLD[s]) are created without a template and involve drawing out individual's understanding of how elements of a problem interact with one another (Peters, 2014).

Figure 7: Core loops example



Model Validation

The purpose of model validation is to determine if the model is acceptable for its intended use (Rykiel 1996). The intended use of this CLD model is to capture and understand factors that are related school sport participation and how these factors interact from a systems perspective. The CLD is a tool to gain system insights and allow

stakeholders to make informed decision about leveraging resources to improve the problem (Hovmand et al., 2012).

Two activities were completed to determine face validity of the CDL (Rykiel, 1996; Groesser & Schwaninger, 2012). The first technique used was content experts. Experts (N=3) in the field of physical activity and recreational youth sports were recruited to insights from a professional lens. Conversations with content experts using tracing, as described below, determined if the CLD captures factors and relationships of school sport participation. Conversations with context experts were also held. These experts were individuals who completed key informant interviews. Context experts are individuals who are currently experiencing the problem or social issue being studies (Klaus & Saunders, 2016). These experts are important for shaping results in community based research (Klaus & Saunders, 2016). The context experts were asked to give their opinion and feedback on the diagram through email and phone conversations. The conversations were captured through note taking then analyzed using an open coding scheme to make modifications to the CLD

The second face validation technique was used was tracing (Rykiel, 1996). This technique allows the behavior of factors in the CLD to be traced through simulations, which helps determine if the behavior is correct as intended by the CLD (Rykiel, 1996). If the behavior of the diagram is correctly drawn, the directionality of arrows and relationships will be representative of reality. To perform this, the key informant interview coding team traced through the loops in the model and determined if the historical representation of the policy flows correctly. Through traces, the researcher was

able to think critically about the relationships between factors and make adjustments as needed. A depiction of the process from model building to model validation can be found in Figure 6: Model building and validating process for study. Model validation ensures that the constructed CLD is grounded and correctly draws insights from the data (Rykiel, 1996).

CHAPTER IV

RESULTS

During Phase I, key informant interviews, archival documents, and financial data were collected and analyzed. Each data source was analyzed individually, then combined for data triangulation. Through these sources, the following researcher questions were explored:

1. What are the financial barriers and facilitators to students participating in school sports team(s)?
2. Why do school districts decide to implement and retain a pay to participate policy?

To provide context for the interpretation of results, the secondary analysis of school district financial data is presented first. See figure 8 for the actual cost of PTP in Springboro High School. As seen in Figure 8, when PTP was implemented in 2007 the fee was $475 per student, per sport (Dayton Daily News, 2010). It slightly increased until 2014, then was lowered, and it is currently $260 per student per sport (Dayton Daily News,

Figure 8: Pay to participate changes per year

2019; Dayton Daily News, 2015). Results from the qualitive investigation provide context for this data.

Results of Phase I

Key Informant Interviews

Semi structured interviews were analyzed using a coding scheme derived from the Consolidated Framework for Implementation Research (Damschroder et al., 2009). Analysis reveals that four CFIR constructs were most prevalent among the eight interviews. These constructs were 1) *available resources*, 2) *culture*, 3) *contributors to implementation*, and 4) *adaptability*. These four constructs indicate recurring patterns within in the data crucial to the results (Drisko, 1997).

Seven of the eight interviewees (n=20 number of CFIR mentions) provided information about *available resources*, which for this study is defined as: state and local level effort to support school funding (Damschroder et al., 2009). The resources key informants spoke about included the school athletics booster club, public-facing fundraisers, fee waiver programs for students who qualify for free and reduced lunch, funding from the school board, and gate fees. For example, one participant stated "*from a booster perspective, the main fundraiser in the booster club is the fan store. All proceeds go back to the athletics for both high school and middle school. The concession stand proceeds also help fundraise.*" Some interviewees (n=3) gave insight into the lack of available resources and this was captured here as well. An example of an interviewee expressing that there is a lack of available resources was expressed as "*there are none*".

Seven interviewees (n=10 number of CFIR mentions) mentioned information that were coded as *adaptability* which is defined as: the degree to which an intervention can be adapted, tailored, refined, or reinvented to meet local needs (Damschroder et al., 2009). For this study, the "intervention" is the PTP policy itself (Foster et al., 2008). Data coded as *adaptability* revealed how the policy has been tailored to meet the needs of the school over time. For example, how the fee has increased or decreased, circumstances for which the fee can be waived, and changes to how the fee can be collected from athletes. An example of the *adaptability* of the policy is exemplified in the quote "*I know there are times it increased a lot, usually based in school finances and if a levy didn't pass it would go up. It [pay to participate] fluctuates depending on need.*"

Another construct frequently coded was *culture*. *Culture* is defined as norms, values, and basic assumptions of a given school/community (Damschroder et al., 2009). Five interviewees explained the *culture* of the school and community (n=11 number of CFIR mentions). Most of the data coded into culture provided insight into the perception and attitude in the community related to PTP. One interviewee stated "*they [the community] wants to support more than just sports; education and curriculum are more at the priority*." This statement reveals that an attitude prevalent in the community is that academics and standardized curriculum are important.

Finally, *contributors to implementation* was referenced, which is defined as: tangible factors and indicators of school need for funding to its decision to implement a PTP policy was another frequently coded construct among the key informant interviews

(5 interviews, n=11 number of CFIR mentions; Damschroder et al., 2009). This construct captured historical data that led to the implementation of the PTP fee such as failed levies, the recession, rising costs, and other district cuts. An exemplary quote of information contained in *contributors to implementation* was stated as "*there have to be cuts somewhere, athletics are usually cut first, politically athletics are easier to cut*."

Results from the analysis are displayed in Table 2. The table depicts each of the CFIR domains and constructs used to inform the research questions in Phase I.

Table 2: Analysis results using CFIR

Name	Interviews (N=8)	Number of Construct Mentions
Community Perception, Impact	0	0
Community Needs & Resources	2	3
External Policies & Incentives	0	0
COVID-19 Impact	7	24
COVID-19 Programming	5	5
Policy Characteristics	0	0
Adaptability	**7**	**10**
Complexity	3	6
Cost	2	2
Evidence Strength & Quality	0	0
Fund Utilization	4	6
Policy Source	1	1
Relative Advantage	1	1
Process	0	0
Engaging	1	1
Executing	0	0

Table 2: Continued

Name	Interview (N=8)	Number of Construct Mentions
External Change Agents	0	0
Opinion Leaders	1	1
Planning	0	0
Reflecting & Evaluating	2	3
Unintended Consequences	5	6
School & School Board	0	0
Access to Knowledge & Information	0	0
Available Resources	**7**	**20**
Compatibility	1	1
Contributors to Implementation	**5**	**9**
Culture	**5**	**11**
Goals & Feedback	0	0
Implementation Climate	4	5
Leadership Engagement	1	1
Policy Characteristics	2	3
Relative Priority	1	1
Tension for Change	1	1

Archival Data

Content Analysis Results

After key informant interviews were analyzed, the content analysis was completed. The majority of documents reviewed were published by the school had a neutral tone that did not mention low-income students. The only school document that mentioned low income students was the form for enrolling in a fee payment plan if the

student qualified for free and reduced lunch. News articles mentioned low income student athletes more often, for example one news article published in 2010 stated "*the cost is affecting a lot of families. A lot of children can't play*" (Dayton Daily News, 2010). It is important to note that at the time this quote was stated the pay to participate fee was $450 per sport rather than the 2020 fee which is $260. Another finding from the content analysis was from the student athlete handbook. A section of the handbook regarding paying fees stated "*all student will be assessed an athletic program fee for every sport in which they participate. There will be no fee waivers.*" This statement contradicts information gathered during key informant interviews during which seven interviewees expressed knowledge of a fee waiver program. Three news articles reported the PTP fee for each school in the district and presented them in a neutral tone with no obvious support and opposition to the fees. In conjunction with reporting fee amounts, news articles spoke to the passing and failing of tax levies and the need for more school funding. For example, one article stated "*the amount of the fee relies on a levy passing—we will reduce the fee when a levy passes*" (Dayton Daily News, 2010).

Financial Data

The news articles and school resources helped provide context to the financial data from the state education department (Ohio Department of Education, 2020). The financial data gathered, and the trends observed show that the school district is not fully funded for its operations. Lower funding in the school district could impact the price of PTP fees which could have an influence on school sports participation in the district. Based on financial data, from 2009 to 2010 the percentage of disadvantaged students

increased by 6%. From the financial trends, the school being studied consistently had a lower local tax effort index than a similar district (Ohio Department of Education, 2020; Figure 10). The local tax effort index is defined as the extent of the effort residents of school districts make in supporting public elementary and secondary education (Ohio Department of Education, 2020). Additionally, the disparity between the Springboro school and the similar district increases in 2015 and continues to increase. The final result to note based on the financial analysis was that the school being study consistently spends less per pupil than a similar district (Ohio Department of Education, 2020). This is shown in the final financial graph, Figure 11.

Figure 9: Percentage of disadvantaged students as defined by ODE

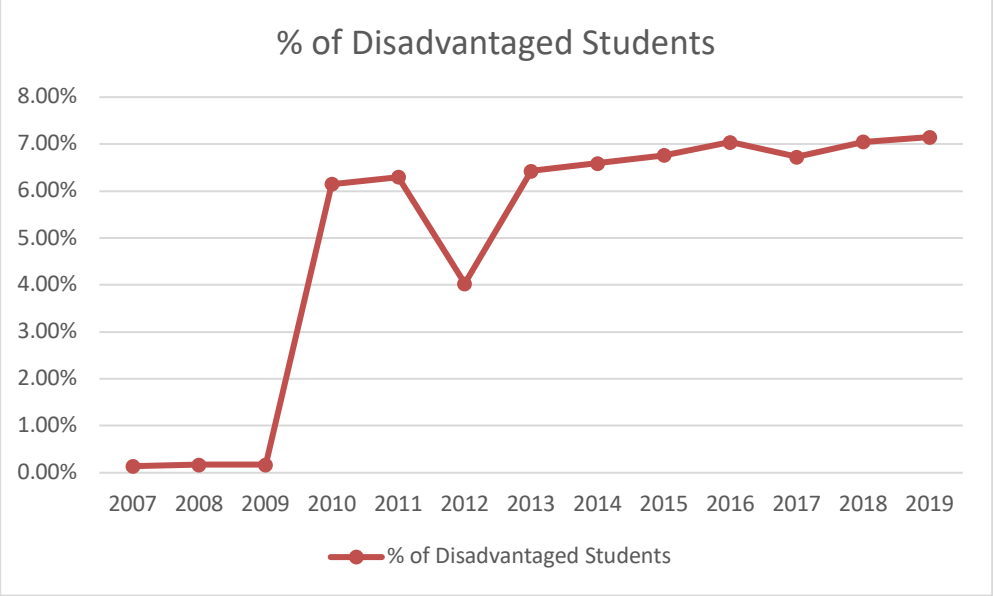


Figure 10: Local tax effort index comparison

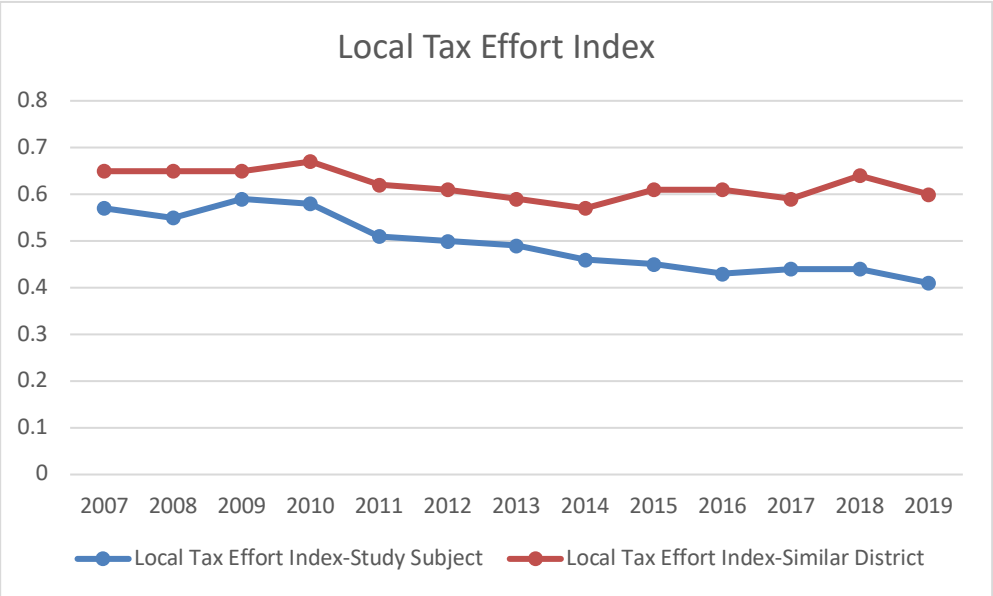
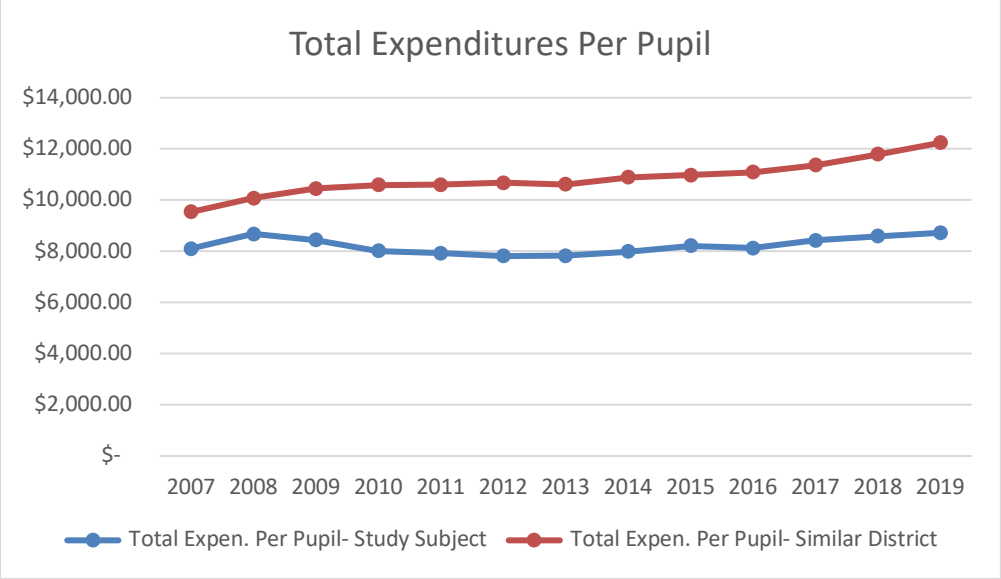


Figure 11: Expenditures per pupil comparison



Data Triangulation

After each of the data sources were analyzed individually, data triangulation was completed to draw findings from the data as whole. This step confirmed findings from

each of the data sources with one another (Carter, Bryant-Lukosius, DiCenso, Blythe, & Neville, 2014).

Results for Research Question 1:

As seen in both the key informant interviews and archival documents, barriers to sports participation was the high cost of the PTP fee. Three interviewees stated that the high cost of the PTP per sport prevented some students from participating or participating in more than one sport. The acknowledgement of this barrier was reflected in the news articles analyzed using the content assessment tool.

From the district financial data, it is evident that the proportion of disadvantaged students has been rising within the district while PTP has remained higher too. Property taxes help fund athletics, therefore the decreasing local tax effort to the school served as a barrier because it kept the PTP higher in comparison to other nearby schools.

Facilitators are the resources key informants spoke about which includes the school athletics booster club, individual sport fundraisers, fee waiver programs for students who qualify for free and reduced lunch, funding from the school board, and gate fees. The school athletics booster club raised money for athletics through a "fan shop" downtown in which all proceeds are given to the athletic fund. The booster club also collected proceeds from the concession stands at the high school football games—these proceeds are also given to athletic fund. This funding is a facilitator because it directly supports the operations of the athletics program so more students are able to participate. Each sport holds fundraisers specifically for their own program, which fund activities that the athletic fund does not, such as camps, uniforms, and equipment. Fundraisers are

a facilitator for sports participation because the sport programs would not be able to sustain without them. Students who qualify for free and reduced lunch are able to apply for a waiver which reduced the total PTP fee paid from $260 to $100. This enables more students to participate in sports. Although the school collects a PTP fee, the funds raised does not fully support the athletic program, therefore the school board contributes $350,000 per year to supplement; this was learned during the key informant interviews. The funding acts as a facilitator as it sustains the existence of athletics in the district. Similar to fundraising, support from the booster club, and support from the school board, gate fees which are entrance fees collected at sporting events, provide a source of funding to sustain the athletic program and provide opportunities for students to participate.

The content analysis of archival documents revealed that property tax levies are a facilitator for school sports participation through funding. Therefore, a property tax levy passing can act as a facilitator for school sports participation. However, if the levy fails—it can become a barrier. It becomes a barrier by leading to a higher PTP cost. One key informant explained how the lowering PTP in 2014 enabled more students to patriciate, and this lowering is reflected in the financial data (Figure 8).

Results for Research Question 2:

Key informants provided insights about the decision making process that led to the implementation PTP. These insights were confirmed by results found in the content analysis and financial analysis of archival documents. For decision making, the key event that led to PTP was a reduction in school district funding. Half of the key

informants explained that when the district's funding was reduced the school board presented a property tax levy to the community that would supplement funding lost. The school board explained that if the levy was passed staff would be cut from the district, bussing within a two mile radius would be cut, and a PTP fee would be implemented at $450 per student per sport. In 2009 the levy failed; this implementation can be seen in the PTP financial analysis graph where there is a fee jump between 2009 and 2010 (Figure 8). This levy failure is also reflected in the financial graph that represents the local tax effort index; there is a drop in the index score from 2009 to 2010 (Figure 10). Although the fee has been lowered over time because of push back from the community, a levy still has not been passed to support the school. This is supported by information from the key informants and the local tax effort index score over time. Reasoning for PTP fee retention was reflected in the content analysis. News articles reported that a lack of school funding or the inability to pass a property tax levy would lead to the continuation of a PTP fee. Based on all key informant interviews, the content analysis, and the district financial data, financial strain district is the main reason behind the decision making, implementation of, and retention of PTP.

Reporting

To report the qualitative findings, the Consolidated criteria for reporting Qualitative studies (COREQ) was used to ensure transparency of the study. COREQ is a 32-item checklist that helps researchers report important aspects of the research team, methods, context of the study, the findings, and analysis (Tong, Sainsbury, & Craig, 2007). The COREQ checklist can be found in Appendix C.

Phase II Results

In Phase II of the study, a systems thinking perspective, using community-based group modeling, was used to conceptualize the PTP policy factors identified in Phase I of the study. The following research question guided the methods for building, interpreting and validating a causal loop diagram (CLD) in Phase II:

3) How do factors influencing school sports participation interact as a system to impact school sport participation across the community?

The relationships and interactions of factors discovered in Phase I were captured in Phase II through a CLD. These factors and relationships are represented as stocks, flows, and feedback in the CLD. Language used to discuss systems concepts and causal loop diagrams can be found in Table 3.

Table 3: System concepts definitions

Concept	Definition
Stock	Factors and elements that make up a system
Flow	Connections and relationships that connect stocks
Directionality	The direction of a flow, identified by "+" and "-" on the causal loop diagram
Feedback loops	Formed when changes in a stock affect the flows into or out of the same stock
Balancing/stabilizing loop	A loop in the diagram that keeps a stock the same- what flows in also flows out. Noted as a "B" in diagrams
Reinforcing loop	A loop in the diagram that increases the stock, can be vicious. Noted as a "R" in diagrams
Closed system	Elements from outside of the system are not able to influence stocks and flows
Open system	Elements from outside of the system can influence behaviors of the stocks and flows
Leverage point	A place in the diagram where a small change could lead to a large shift in behavior

Table 3: Continued

Concept	Definitions
Time delay	An element in a system to account for behavior over time between the stocks and flows. Can be introduced as an leverage point in some interventions. This is represented in a diagram as "//"
*Definitions adapted from Meadows, 2008; Williams & Hummelbrunner, 2010	

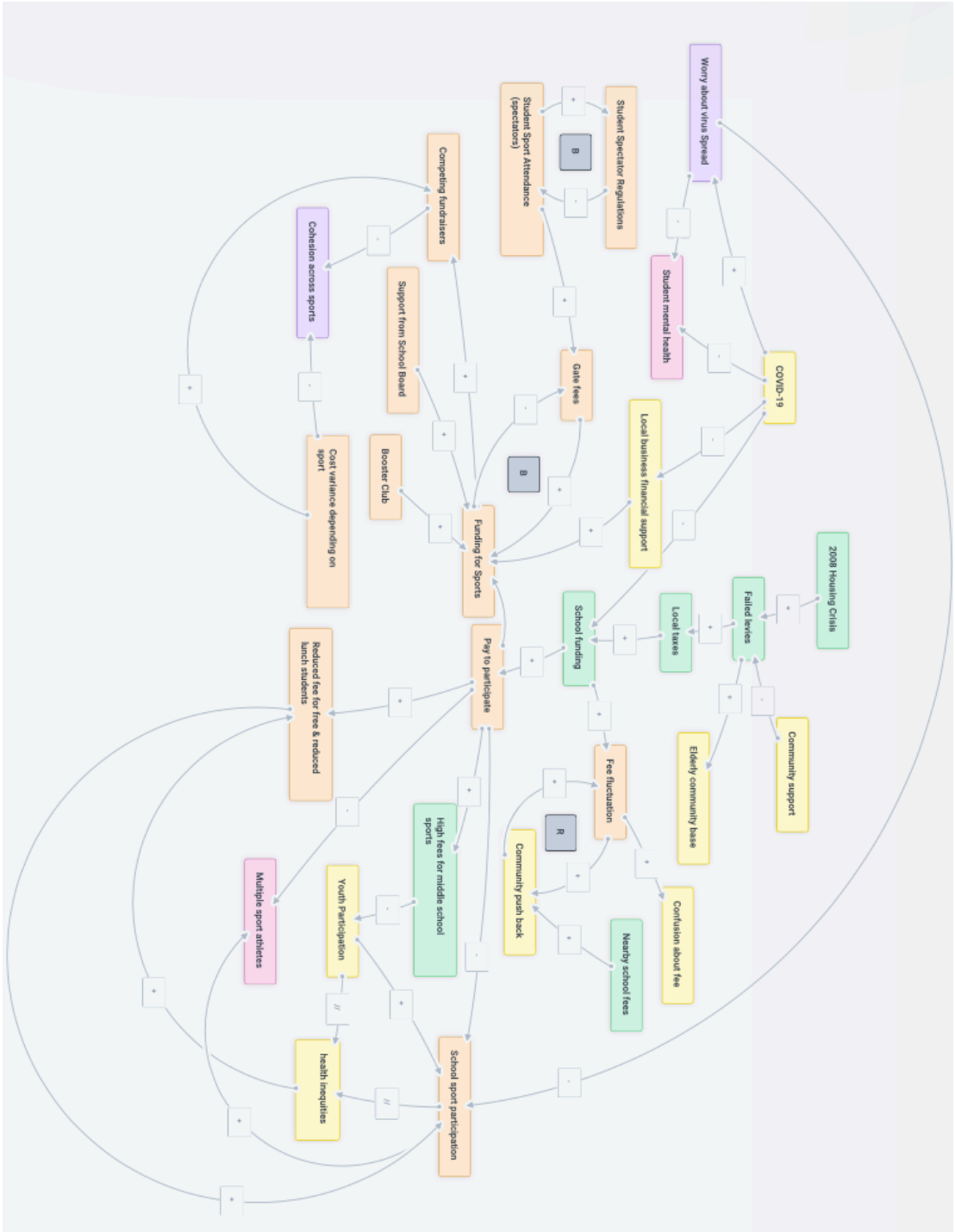
Community Based Group Modeling

Based on the case study findings, PTP was selected as the initial stock. To start building the CLD, the PTP stock and its influencing factors were illustrated in as a core loop. After the core loops were drawn, additional stocks, including booster club funding, funding from the school board, and local tax revenue, which were identified in data triangulation were added to the CLD. Once all stocks were entered into the online software, arrows showing relationships, or flows, were added. On each of the arrows, labels with a "+" or "-" were added to show directionality of each relationship. The "+" represents a stock being reinforced by the flow. A "-" represents a stock being stabilized by the flow. The stocks were color-coded to represent different levels of the SEM. Table 4 details what each color represented.

Table 4: Social ecological model color-coding for causal loop diagram

Level of the Social-Ecological Model	Color
Individual	Red
Interpersonal	Purple
Organizational	Orange
Community	Yellow
Policy	Green

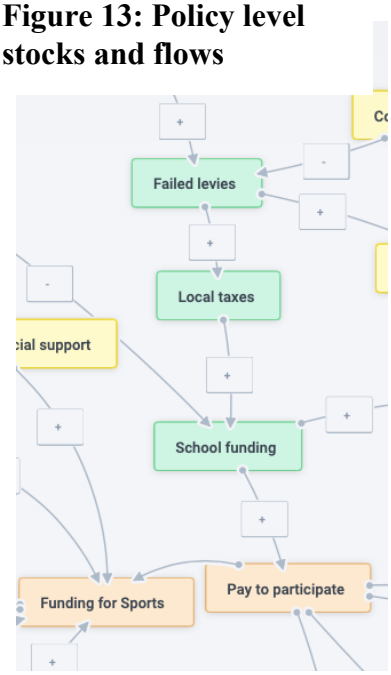
Figure 12: Full concept loop diagram



Description of Causal Loop Diagram

The full CLD can be found in Appendix E and in Figure 12. Each of the stocks in the model are key factors that were learned through the key informant interviews and archival documents. The flows between each of the stocks are connections that were described by key informants or were gleaned from archival documents. For example, the stock of "failed levies" flowing into "school funding" was learned through key informants. After building and analyzing the CLD, insights can be drawn from the diagram (Hovmand, 2014). A major driver of the CLD is funding for the school district. This can be seen through policy level stocks and flows that lead to PTP implementation. This section has been highlighted from the larger diagram and shown in Figure 13. The CLD also has balancing and reinforcing loops. One balancing loop is how funding for sports increases gate fees. Lower funding for sports forced administration to increase gate fees to gain entry to sporting events. Another balancing loop in the CLD in the relationship between PTP fee fluctuation and community member push back. As the fee is changed, there is push back from the community. Also, the fee has been changed multiple times based on

Figure 13: Policy level stocks and flows



push back from the community. A reinforcing behavior in the CLD is the cost of PTP. This behavior is shown in Figure 14, represented by a behavior over time graph (BOTG). A BOTG shows a pattern, trend, or variable over time (Waters Foundation, 2008). A reinforcing behavior is a BOTG can indicate that the behavior in the CLD is increasing over time (Hoehner, Sabounchi, Brennan, Hovmand, & Kemner, 2015). Another important element of the diagram to highlight is the health inequities stock and its time-delayed relationship with other stocks. Time delays are often the response to a long-run behavior in a system (Sterman, 2002). Health inequities are difficult to capture in a CLD because they are formed or changed over time. In this CLD, sports participation at the high

Figure 14: Pay to participate cost over time graph

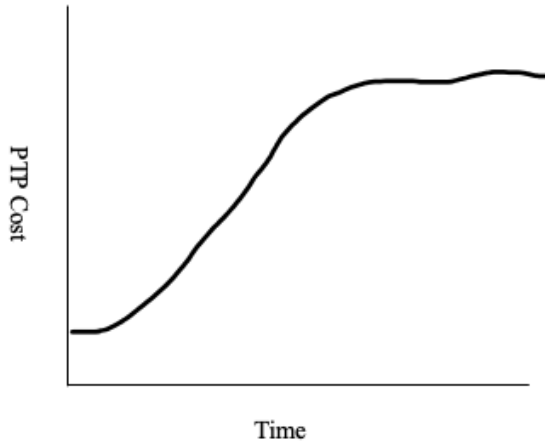
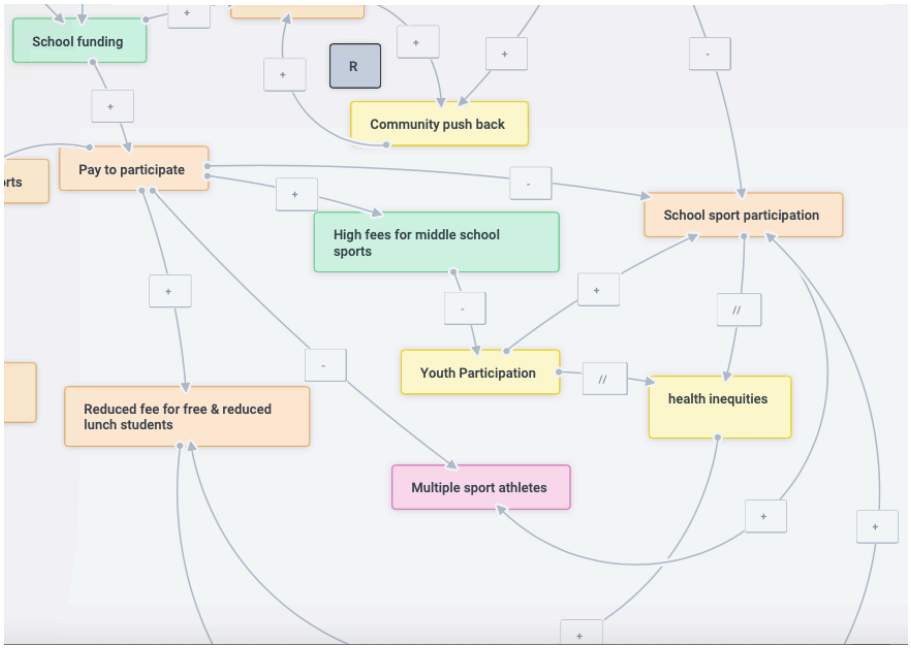


Figure 15: Health inequities and time delays



school and middle school level over time could lead to health inequities if equitable participation is not available. While everything in the diagram is connected through various flows, the section of the CLD that is most closely related to heath inequities has been highlighted and shown in Figure 15. The whole, and final version of the CLD can be found in Appendix E.

The CLD created in this study was considered an open system. This means that is allows input from its surrounding can be impacted by external forces to the system (Haines, 1998). It is important to consider how, in the context of school sports participation, feedback from outside of the CLD changes behavior in the diagram (Haines, 1998). The CLD created in this study was considered an open system because it relies heavily on external influences such as funding from the state or state level polices that determine legislation for PTP.

Systems Map Validation

Validating the CLD is an important step in CBGM because it builds the community's confidence in the model and strengthens the relationship with the researcher (Happach, Veldhuis, Vennix, & Rouwette, 2012). The intended use of this map is to capture and understand the community perspective of school sport participation. Another use of the map is that it can be used as a tool for gaining system insights and allow stakeholders to make more informed decision about leveraging resources to improve the problem, thus building community capacity (Hovmand et al., 2012).

Two validation techniques were used to determine face validity (Rykiel, 1996; Groesser & Schwaninger, 2012). The CLD was shared with content experts in health education research who study PTP or youth sport participation. Feedback from the content experts included changing the name of factors to increase understandability. For example, changing "high fees for youth sports" to "high fees for middle school sports" as the latter more accurately captured what the factor was meant to represent. Another expert suggested adding gender and race/ethnicity to the CLD and these important factors were captured within "health inequities" as that is a factor that can be manipulated with directionality and changed in a system.

Through this, the content experts were able to determine if the CLD captured their perspective of PTP and its interrelationships with a community. Their feedback was incorporated. This process was also completed with context experts from the community (Klaus & Saunders, 2016). However, their feedback was minimal and they felt that the CLD captured what they stated during the key informant interviews. The final face validation step was tracing. From tracing, feedback loops were identified and added to the CLD. An example of a feedback loop that was added was how funding for sports programs decrease gate fees and increased gate fees can add more funding for the sports programs. This is a balancing loop.

Through these validation techniques, it was determined that the map was grounded and justifiable and factors had correctly drawn from the data (Rykiel, 1996).

CHAPTER V

DISCUSSION AND CONCLUSIONS

Through this mixed methods case study, the study's overarching research questions have been thoroughly explored. The barriers/facilitators related to school sports participation and decision-making factors for PTP policies were documented and understood then illustratively shown using community-based group modeling. The findings represented in the CLD show that financial strain plays a major role in the complex problem of school sports participation. When school districts face financial strain it is important to consider how inequities are impacted by policies passed to mitigate this strain. To better consider systemic inequities, a systems perspective and CDL can be utilized to simplify the experience of a complex issue (Williams & Hummelbrunner, 2010). As a result of this study, we learn that using a systems perspective with community stakeholders can create a shared understanding of an issue and increase capacity for action (Hovmand, 2014).

Health Inequities & Leverage Points

PTP polices have the potential to exacerbate inequities among students. This is possible because the high costs of PTP fees can create a barrier to participation. While the school district does not have a large disadvantaged population, the school does have the highest PTP fee in the Dayton metropolitan area (Dayton Daily News, 2019). An article published by the Dayton Daily news compared PTP fees among all schools in the area and Springboro had the highest, this could create a barrier that nearby schools may not experience (2019). One finding was that PTP fees keep sports programs functioning

rather than cutting them altogether to save costs. These findings are supported by results in both Phase I and Phase II of the study. Together, these findings suggest a need for increased funding for school so all students have the potential to access sports program equitably without PTP serving as a barrier. While ideal, the solution to increase funding is not always realistic or feasible. This is where leverage points within the CLD would be useful.

Leverage points are places to intervene in a system where change can be made to improve behavior or a desired outcome (Meadows, 2008). There are different types of changes that can serve as leverage points. Numbers, referencing constants and parameters such as subsidies and taxes are often used and can be politically charged leverage points (Meadows, 2008). In the CLD, the influence of the local tax effort can be seen clearly. The lower tax effort leads to a higher need for PTP which decreases access to sports participation at the high school and middle school level, creates a need for a waiver program, limits the number of sports a student can participate in, and elicits a need from other programs to supplement funds (Booster Club, individual sports programs, and the school board). This finding is consistent with previous research into levy failures and PTP (Grant, 2017). Therefore, the first recommended leverage point is to pass a local tax levy to increase tax effort and funding for the school.

This recommendation is supported by analyzing stock and flows in the CLD and was informed by key informant interviews, the content analysis, and the financial analysis (Chapter IV Results). Three of the key informant interviews mentioned the passing of a tax levy in relation to implementing a PTP policy. Information extracted

from the content analysis revealed that without a tax levy passing, a PTP policy would be implemented among other cuts within the district. In terms of leverage points, numbers are the fastest way to influence a system (Meadows, 2008). Finally, through financial analysis, a consistently low local tax effort index and a rising PTP fee shows more school funding is needed. Although changing how the school is funded, numbers as leverage points are not always the most impactful and are not usually worth the effort put forth (Meadows, 2008).

After considering that the proposed leverage point may not be a solution to PTP long term, another leverage point is suggested. A justification for implementing a PTP policy is that there is no agreed upon standard for what is included in a free public education (Grant, 2017; Hoff & Mitchell, 2006). Therefore, the alternative leverage point that would eliminate PTP is the intervention strategy rules (Meadows, 2008). Rules are the rules of the system which define the scope, its boundaries, and degrees of freedom (Meadows, 2008). Laws are an example of rules. If sports and extracurricular activities were included in a free public education by law, PTP would not be necessary. This would mean including a change at the state level. A change in what is included in a free public education would include not only sports programs, but other extracurriculars such as music, arts, literature, and other academic clubs. It is important to note that this would not come without unintended consequences. To fund the expansion of what is included in a free public education the funding would need to be funneled from another government funded service so that taxes are not cumbersome for the tax payers. The funds would need to come from military, law enforcement, health care, or another

service. This could have serious implications and warrants further exploration. A consideration would be to determine if securing health equity and accessible opportunities is worth the shift in rules.

Community Based Group Modeling in Community Based Research

Another important implication of the study was the practice of CBGM. The purpose of the CBGM was to better understand a complex problem using a community lens. Through this study, community members were able to develop skills to build CLDs and become equipped with more capacity to change locally identified problems. A key informant from this study has shown that CBGM can increase capacity for action. The treasurer of the school board will be using the CLD for presentations about the new property tax levy proposal. The CLD will show community members who attend meeting how the property tax levy will have systemic change within the school district. Lessons learned from this study also serve as an example for future community-based research. Future research initiative can utilize the community based group modeling process to define problems with communities, build CDLs collaboratively, and identity leverage points for community resources.

Limitations

A limitation of the study was that only the opinions and perspectives of the key informants identified through snowball sampling were included. In future studies it would be important to identify more external community members such as business owners or other informal community leaders. This expansion of the study sample could lead to a more comprehensive understanding of the community perspective. Case studies

are useful for exploring an issue in-depth and holistically, however, case studies do have their limitations (Yin, 2017). The results will not be largely generalizable outside of its setting, but the purpose was to understand a complex social phenomena from the community perspective (Yin, 2017). As this was a community based study, the impact of COVID 19 led to some limitations. Social distancing and limiting in-person contact was necessary to ensure the safety of the participants and the researcher, therefore all contact was done through phone calls and email. To build community capacity and trust between the researcher and participants, in-person meetings may have led to greater outcomes. However, this limitation did not impact the major findings of the study.

Implications for Health Education

Findings from this mixed methods case study provide evidence about the barriers and facilitators for school sports participation. It also provides insight into why a school district implements and retains a PTP policy. Additionally, the study and its findings show that CBGM is a strategy for CBPR. The CBGM process involves stakeholders in participatory systems thinking which can help bridge the gap between research and practice in community health education (Gillen et al., 2014). Through this, stakeholders are able to see the complex multilevel factors related to complex problems within their community (Gillen et al., 2014). Throughout this study, CBGM allowed the researcher to equitably collaborate with members of the community to contribute expertise and create a shared understanding (Satcher, 2005). CBPR can allow information to be disseminated to community stakeholders that make environmental and program changes locally (Garney, et al., 2015). We found that CBGM can increase understanding of the

information by accounting for interrelationships between factors. A goal of CBPR is to lead to community led change; this was achieved through skill building during the CBGM process of the study. As a result of CBGM, advocacy for a property tax levy is being done using the CLD developed and the skills learned in the study.

As we result of this study, it is confirmed that CBGM can be used as a tool used in decision making and can help stakeholders mobilize strategies when addressing a local problem (Hovmand, 2014). Group modeling is a strategy that can help individuals gain more insight into the structure and behavior of a system; in this case their own community (Andersen, Richardson, Vennix, 1997).

REFERENCES

Acumen. (2019). *Build loops and discover the deep structure.* Systems Practice

Alexander, R. H. The legality of high school athletic fees. *J. Legal Aspects Sport*. 1997; *7*, 118.

Andersen, D. F., Richardson, G. P., & Vennix, J. A. Group model building: adding more science to the craft. *System Dynamics Review: The Journal of the System Dynamics Society*, 1997; *13*(2), 187-201.

Andersen, D. F., Vennix, J. A., Richardson, G. P., & Rouwette, E. A. Group model building: problem structuring, policy simulation and decision support. *Journal of the Operational Research Society*, 2007; *58*(5), 691-694.

Andrews, J. O., Tingen, M. S., Jarriel, S. C., Caleb, M., Simmons, A., Brunson, J., ... & Magwood, G. (2012). Application of a CBPR framework to inform a multi-level tobacco cessation intervention in public housing neighborhoods. *American Journal of Community Psychology*, *50*(1-2), 129-140.

Appleton, J. V., & King, L. (1997). Constructivism: A naturalistic methodology for nursing inquiry. Advances in Nursing Science, 20(2), 13-22.

Berge, J. M., Mendenhall, T. J., & Doherty, W. J. (2009). Using Community-Based Participatory Research (CBPR) to target health disparities in families. *Family relations*, *58*(4), 475-488.

Brennan, L. K., Sabounchi, N. S., Kemner, A. L., & Hovmand, P. (2015). Systems thinking in 49 communities related to healthy eating, active living, and childhood obesity. *Journal of Public Health Management and Practice*, *21*, S55-S69.

Boddy, C. R. (2016). Sample size for qualitative research. *Qualitative Market Research: An International Journal*, *19*(4), 426-432.

Boginski, V., Butenko, S., & Pardalos, P. M. (2005). Statistical analysis of financial networks. Computational statistics & data analysis, 48(2), 431-443.

Burkhardt, R. (2016).The Impact of Poverty on Participation in Extracurricular Activities.

Bucy, M. (2013).The costs of the pay-to-play model in high school athletics. *U. Md. LJ Race, Religion, Gender & Class*; *13*, 278.

Carter, N., Bryant-Lukosius, D., DiCenso, A., Blythe, J., & Neville, A. J. (2014, September). The use of triangulation in qualitative research. In *Oncology Nursing Forum* (Vol. 41, No. 5, pp. 545-547).

Castleden, H., Morgan, V. S., & Lamb, C. (2012). "I spent the first year drinking tea": Exploring Canadian university researchers' perspectives on community-based participatory research involving Indigenous peoples. *The Canadian Geographer*/Le Géographe canadien, 56(2), 160-179.

Cavaye, J. M., & Cavaye, J. (2000). *The role of government in community capacity building*. Brisbane: Department of Primary Industries.

Centers for Disease Control and Prevention. Results from the School Health Policies and Practices Study. 2017; Available from: https://nccd.cdc.gov/youthonline/App/Results.aspx?TT=B&OUT=0&SID=HS&QID=H83&LID=LL&YID=RY&LID2=&YID2=&COL=&ROW1=&ROW2=&HT=&LCT=&FS=&FR=&FG=&FA=&FI=&FP=&FSL=&FRL=&FGL=&FAL

=&FIL=&FPL=&PV=&TST=&C1=&C2=&QP=L&DP=&VA=CI&CS=Y&SYID=&EYID=&SC=&SO=

Chrisman, M., Nothwehr, F., Yang, G., & Oleson, J. (2015). Environmental influences on physical activity in rural Midwestern adults: a qualitative approach. *Health promotion practice*, *16*(1), 142-148.

County Health Rankings. (2018). Ohio: Warren county. Accessed here: https://www.countyhealthrankings.org/app/ohio/2018/rankings/warren/county/outcomes/overall/snapshot

C.S. Mott Children's Hospital. Pay-to-play sports keeping some kids on the sidelines. *University of Michigan Department of Pediatrics and Communicable Diseases*. 2015; 22(6).

Damschroder, L. J., Aron, D. C., Keith, R. E., Kirsh, S. R., Alexander, J. A., Lowery, J. C. (2009). Fostering implementation of health services research findings into practice: A Consolidated Framework for Advancing Implementation Science. *Implementation Science*, 4, 50. doi:10.1186/1748-5908-4-50

Drisko, J. W. (1997). Strengthening qualitative studies and reports: Standards to promote academic integrity. Journal of social work education, 33(1), 185-197.

Eime, R. M., Young, J. A., Harvey, J. T., Charity, M. J., & Payne, W. R. (2013)A systematic review of the psychological and social benefits of participation in sport for children and adolescents: informing development of a conceptual model of health through sport. *International journal of behavioral nutrition and physical activity*. ;*10*(1), 98.

Elmore, R. F. (1979). Backward mapping: Implementation research and policy decisions. *Political science quarterly*, *94*(4), 601-616.

Eyler, A. A., Piekarz-Porter, E., & Serrano, N. H. Pay to play? State laws related to high school sports participation fees. *Journal of public health management and practice*. 2019; *25*(3), E27-E35.

Eyler, A. A., Valko, C., & Serrano, N. (2018). Perspectives on High School "Pay to Play" Sports Fee Policies: A Qualitative Study. *Translational Journal of the American College of Sports Medicine*. *3*(19), 152-157.

Foster, G. D., Sherman, S., Borradaile, K. E., Grundy, K. M., Vander Veur, S. S., Nachmani, J., ... & Shults, J. (2008). A policy-based school intervention to prevent overweight and obesity. *Pediatrics*, *121*(4), e794-e802.

Fusch, P. I., & Ness, L. R. (2015). Are We There Yet? Data Saturation in Qualitative Research. The Qualitative Report, 20(9), 1408-1416. Retrieved from http://nsuworks.nova.edu/tqr/vol20/iss9/3

Garney, W. R., Beaudoin, C. E., Clark, H. R., Drake, K. N., Wendel, M. L., McLeroy, K. R., ... & Shaw, R. L. (2015). Using community-based participatory research to disseminate a mass media campaign into rural communities. *Journal of health communication*, *20*(7), 799-806.

Garney, W. R., Szucs, L. E., Primm, K., King Hahn, L., Garcia, K. M., Martin, E., & McLeroy, K. (2018). Implementation of Policy, Systems, and Environmental Community-Based Interventions for Cardiovascular Health Through a National

Not-for-Profit: A Multiple Case Study. *Health Education & Behavior*, *45*(6), 855-864.

Gillen, E. M., Hassmiller Lich, K., Yeatts, K. B., Hernandez, M. L., Smith, T. W., & Lewis, M. A. (2014). Social ecology of asthma: engaging stakeholders in integrating health behavior theories and practice-based evidence through systems mapping. *Health education & behavior*, 41(1), 63-77.

Golden, S. D., McLeroy, K. R., Green, L. W., Earp, J. A. L., & Lieberman, L. D. (2015). Upending the social ecological model to guide health promotion efforts toward policy and environmental change.

Goodman, R. M., Speers, M. A., McLeroy, K., Fawcett, S., Kegler, M., Parker, E., ... & Wallerstein, N. (1998). Identifying and defining the dimensions of community capacity to provide a basis for measurement. *Health Education & Behavior*, *25*(3), 258-278

Goodman, L. A. (1961). Snowball sampling. *The annals of mathematical statistics*, 148-170.

Giacomini, M. K., Cook, D. J., & Evidence-Based Medicine Working Group. (2000). Users' guides to the medical literature: XXIII. Qualitative research in health CareB. What are the results and how do they help me care for my patients?. *Jama*, *284*(4), 478-482.

Goins, R. T., Williams, K. A., Carter, M. W., Spencer, S. M., & Solovieva, T. (2005). Perceived barriers to health care access among rural older adults: a qualitative study. *The Journal of Rural Health*, *21*(3), 206-213.

Grant, S. S. (2017). A Multiple Case Study Analysis of Ohio Interscholastic Extracurricular Pay to Participate Policies (*Doctoral dissertation, Bowling Green State University*).

Gregson, J., Foerster, S. B., Orr, R., Jones, L., Benedict, J., Clarke, B., ... & Zotz, K. (2001). System, environmental, and policy changes: using the social-ecological model as a framework for evaluating nutrition education and social marketing programs with low-income audiences. *Journal of nutrition education*, *33*, S4-S15.

Griffith University. (2020). Different types of literature review. Accessed September 7, 2020 here: https://libraryguides.griffith.edu.au/c.php?g=451351&p=3333115

Groesser, S. N., & Schwaninger, M. (2012). Contributions to model validation: hierarchy, process, and cessation. *System Dynamics Review*, *28*(2), 157-181.

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. *Handbook of qualitative research*, *2*(163-194), 105.

Haines, S. G. (1998). The manager's pocket guide to systems thinking & learning. *Human Resource Development.*

Happach, R. M., Veldhuis, G., Vennix, J. A. M., & Rouwette, E. A. J. A. (2012). Group model validation. *Switzerland: System Dynamics Conference*.

Hoehner, C. M., Sabounchi, N. S., Brennan, L. K., Hovmand, P., & Kemner, A. (2015). Behavior-over-time graphs: assessing perceived trends in healthy eating and active living environments and behaviors across 49 communities. *Journal of Public Health Management and Practice*, 21, S45-S54.

Holton, J. A. (2007). The coding process and its challenges. *The Sage handbook of grounded theory*, (III), 265-89.

Hovmand, P.S. Community-based system dynamics. *Springer*, New York, NY. 2014.

Hovmand, P. S., Andersen, D. F., Rouwette, E., Richardson, G. P., Rux, K., & Calhoun, A. Group model-building 'scripts' as a collaborative planning tool. *Systems Research and Behavioral Science*, 2012; *29*(2), 179-193.

Holt, N. L., Kingsley, B. C., Tink, L. N., & Scherer, J. (2011). Benefits and challenges associated with sport participation by children and parents from low-income families. *Psychology of sport and exercise*, *12*(5), 490-499.

Israel, B. A., Lantz, P. M., McGranaghan, R. J., Guzman, J. R., Lichtenstein, R., & Rowe, Z. (2005). Documentation and evaluation of CBPR partnerships. *Methods in Community-Based Participatory Research*, 255-277.

Israel, B. A., Schulz, A. J., Coombe, C. M., Parker, E. A., Reyes, A. G., Rowe, Z., & Lichtenstein, R. L. (2019). Community-based participatory research. *Urban Health*, 272.

Jewett, R., Sabiston, C. M., Brunet, J., O'Loughlin, E. K., Scarapicchia, T., & O'Loughlin, J. (2014). School sport participation during adolescence and mental health in early adulthood. *Journal of adolescent health*, *55*(5), 640-644.Hoff, D. L., & Mitchell, S. N. Pay-to-play: fair or foul? *Phi Delta Kappan*. 2006; *88*(3), 230-234.

Joens-Matre, R. R., Welk, G. J., Calabro, M. A., Russell, D. W., Nicklay, E., & Hensley, L. D. Rural–urban differences in physical activity, physical fitness, and

overweight prevalence of children. *The Journal of rural health*, 2008; *24*(1), 49-54.

Johnston, L. D., Delva, J., & O'Malley, P. M. (2007). Sports participation and physical education in American secondary schools: current levels and racial/ethnic and socioeconomic disparities. *American journal of preventive medicine*, 33(4), S195-S208.

Johnstone, P. L. (2004). Mixed methods, mixed methodology health services research in practice. *Qualitative health research*, 14(2), 259-271.

Klaus, T. W., & Saunders, E. (2016). Using collective impact in support of communitywide teen pregnancy prevention initiatives. *Community Development*, 47(2), 241-258.

Langille, J. L. D., & Rodgers, W. M. (2010). Exploring the influence of a social ecological model on school-based physical activity. *Health education & behavior*, 37(6), 879-894.

Lautner, S.C., Elyer, A.A., Spengler, J.O. (2019) A media analysis of sports participation fees and student athlete health equity. *Active Living Research Annual Conference* Oral presentation. February, Charleston, S.C.

Lautner, S. C., Patterson, M. S., Ramirez, M., & Heinrich, K. (2020). Can CrossFit aid in addiction recovery? An exploratory media analysis of popular press. *Mental Health and Social Inclusion*.

Mackenzie, N., & Knipe, S. (2006). Research dilemmas: Paradigms, methods and methodology. *Issues in educational research*, *16*(2), 193-205.

Macintyre, S., Maciver, S., & Sooman, A. (1993). Area, class and health: should we be focusing on places or people?. *Journal of social policy*, *22*(2), 213-234.

Mayring, P. (2004). Qualitative content analysis. *A companion to qualitative research*, *1*, 159-176.

McLeroy, K. R., Bibeau, D., Steckler, A., & Glanz, K. (1988). An ecological perspective on health promotion programs. *Health education quarterly*, *15*(4), 351-377.

Meadows, D. H. (2008). *Thinking in systems: A primer*. Chelsea Green Publishing.

Midgley, G. (2006). Systems thinking for evaluation. Systems concepts in evaluation: An expert anthology, 11-34.

Midgley, G. (Ed.). (2003). Systems thinking. London, Thousand Oaks, CA: Sage.

Miles, M. B., & Huberman, A. M. (1984). Drawing valid meaning from qualitative data: Toward a shared craft. *Educational researcher*, *13*(5), 20-30.

Minkler, M., & Wallerstein, N. (Eds.). (2011). *Community-based participatory research for health: From process to outcomes*. John Wiley & Sons.

Mosavel, M., Simon, C., Van Stade, D., & Buchbinder, M. (2005). Community-based participatory research (CBPR) in South Africa: engaging multiple constituents to shape the research question. *Social science & medicine*, 61(12), 2577-2587.

Neely, K. C., & Holt, N. L. (2014). Parents' perspectives on the benefits of sport participation for young children. *The Sport Psychologist*, *28*(3), 255-268.

Noy, C. (2008). Sampling knowledge: The hermeneutics of snowball sampling in qualitative research. *International Journal of social research methodology*, *11*(4), 327-344.

Ohio Department of Education. Ohio School Report Cards. 2018. Accessed here: https://reportcard.education.ohio.gov/home

Park, T., Eyler, A. A., Tabak, R. G., Valko, C., & Brownson, R. C. (2017). Opportunities for promoting physical activity in rural communities by understanding the interests and values of community members. *Journal of environmental and public health*, *2017*.

Patton, M. Q. (1990). *Qualitative evaluation and research methods*. SAGE Publications, inc.

Plectica. (2020). About. Accessed September 7, 2020 here: https://www.plectica.com/about-us

QSR International (2019). *What is NVivo?* Accessed here: https://www.qsrinternational.com/nvivo/what-is-nvivo

Rausch, K. I. (2005). Pay-to-play: a risky and largely unregulated solution to save high school athletic programs from elimination. *Suffolk UL Rev.*, *39*, 583.

Rindskopf, & K. J. Sher (Eds.), APA handbook of research methods in psychology, Vol. 2. Research designs: Quantitative, qualitative, neuropsychological, and biological (pp. 141-155). Washington, DC, US: American Psychological Association.

Robinson, K. L., Driedger, M. S., Elliott, S. J., & Eyles, J. (2006). Understanding facilitators of and barriers to health promotion practice. *Health Promotion Practice*, *7*(4), 467-476.

Rykiel Jr, E. J. (1996). Testing ecological models: the meaning of validation. *Ecological modelling*, *90*(3), 229-244.

Sargent, R. G. (2010). Verification and validation of simulation models. In *Proceedings of the 2010 Winter Simulation Conference* (pp. 166-183). IEEE.

Sim, L. J., Parker, L., & Kumanyika, S. K. (Eds.). (2010). Bridging the evidence gap in obesity prevention: a framework to inform decision making. National Academies Press.

Small, M. L. (2011). How to conduct a mixed methods study: Recent trends in a rapidly growing literature. *Annual review of sociology*, *37*, 57-86.

Sterman, J. System Dynamics: systems thinking and modeling for a complex world. 2002.

Sullivan, M., Kone, A., Senturia, K. D., Chrisman, N. J., Ciske, S. J., & Krieger, J. W. (2001). Researcher and researched-community perspectives: Toward bridging the gap. Health Education & Behavior, 28(2), 130-149.

Thompson, S. K. (2002). `Sampling` (2nd ed.). New York, NY: Wiley.

Tinsley, H. E., & Weiss, D. J. (1975). Interrater reliability and agreement of subjective judgments. *Journal of Counseling Psychology*, *22*(4), 358.

Tong, A., Sainsbury, P., & Craig, J. (2007). Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International journal for quality in health care*, *19*(6), 349-357.

Travers, R., Wilson, M. G., Flicker, S., Guta, A., Bereket, T., McKay, C., ... & Rourke, S. B. (2008). The greater involvement of people living with AIDS principle:

Theory versus practice in Ontario's HIV/AIDS community-based research sector. AIDS care, 20(6), 615-624.

Tremblay, M. A. The key informant technique: A nonethnographic application. *American Anthropologist*, 1957; *59*(4), 688-701.

United Health Foundation. America's Health Rankings: Ohio Annual Report. 2018. Accessed here: https://www.americashealthrankings.org/explore/annual/measure/Sedentary/state/OH

United States Census Bureau. (2019). Quick facts, Ohio: Springboro city; Ohio. Accessed here: https://www.census.gov/quickfacts/fact/table/OH,springborocityohio/PST045219

Van Boekel, M., Bulut, O., Stanke, L., Zamora, J. R. P., Jang, Y., Kang, Y., & Nickodem, K. Effects of participation in school sports on academic and social functioning. *Journal of Applied Developmental Psychology*. 2016; *46*, 31-40.

Wallerstein, N. B., & Duran, B. (2006). Using community-based participatory research to address health disparities. *Health promotion practice*, *7*(3), 312-323.

Wallerstein, N., & Duran, B. (2017). The theoretical, historical and practice roots of CBPR. *Community Based Participatory Research for Health: Advancing Social and Health Equity,*.

Waters Foundation. (2008). Tips for behavior-over-time graphs (BOTGs). Accessed here: https://www.watersfoundation.org/webed/mod3/downloads/Tips-BOTGS.pdf

Williams, B., & Hummelbrunner, R. (2010). Systems concepts in action: a practitioner's toolkit. Stanford University Press.

Yin, R. K. (2017). Case study research and applications: Design and methods. Sage publications.

Zdroik, J., & Veliz, P. (2016). The influence of pay-to-play fees on participation in interscholastic sports: a school-level analysis of Michigan's public schools. *Journal of physical activity and health*, *13*(12), 1317-1324.

APPENDIX A

INTERVIEW GUIDE

Community Based Participatory Systems Dynamics Building: Pay to Participate
Key Informant Interview

INTRODUCTION:
Facilitator and respondent make introductions. Discuss the purpose of the interview, (*to gather information from key community members on beliefs surrounding pay to participate and physical activity access within the school district in Ohio and other important information about the community related to the study*), and the role of each. This discussion is voluntary; you do not have to answer any questions that you are uncomfortable answering.

OPENING STATEMENT:
Based on some preliminary knowledge, I know Springboro currently maintains a pay to participate policy. Today, I would like to discuss beliefs within the community and school district that are related to the policy. Your insight will help inform a systems dynamics map that seeks to capture the scope of the impact that pay to participate could have; both for students and the community overall.

KEY QUESTIONS:

Pay to Participate History

1. When was pay-to-participate implemented?
2. Why was pay-to-participate implemented?
3. What did that process look like?
4. Has the policy changed over time?
5. At the time of implementation, were there other cuts within the district (academically or extracurricular) due to funding?
    a. If so, what cuts were made? (academic, co-curricular, extracurricular..?)
6. Are there any initiatives to help students pay for sports?
    a. Booster clubs, sponsoring programs? Expand.
7. Does Springboro School District offer a waiver program?
        i. Waiver: a form/program that allows fees to be waived if a student qualifies for free and reduced lunch or another assistance program
8. Where do the pay to participate policy funds get deposited? Into the athletic fund, general fund, or another fund?

9. What are they used for?
10. Are there any success metrics associated with the pay to participate policy?
    a. If yes, what are they? Who are they reported to? How often are the measured?

Community

11. How has the community responded to pay-to-participate?
12. What are some of the beliefs or attitudes within the school regarding pay-to-participate?
    a. Has there been support or any resistance from school district faculty and staff?
13. Are there any other changes over the past 10 years you have noticed since the fee was implemented?
    a. For example, have you noticed a change in school culture, local economy…

Impact

14. Do you believe pay to participate affected lower-income students?
15. Did the fee have an impact on girls' enrollment rates?
    a. Were sports that girls primarily participate in impacted?
    b. If so, how?
16. When pay to play was implemented, did students leave to enroll in nearby schools?
    a. If so, in what way did that impact the school?
17. How has COVID-19 impacting funding for sports?
18. Did the school provide any alternative programming?
19. What do you think the long term impact might be of COVID-19?

Other:

20. Anything else you would like to share with me about access to school sports in Springboro?

ENDING QUESTIONS:

Thank you for your time today. Your feedback will us work towards investigating and understanding how pay to play impacted Springboro High School students and the community at large. Is there anything else you want to say but did not get a chance to?

Also, if there any other key community members you think I should speak with that can provide some insight in to pay to participate, would you mind providing them my contact information?

APPENDIX B

CFIR CONSTRUCT CROSSWALK TABLE

Topic/Description	*Stakeholder Interview*	*District Financial Data*	*Local Archival Data*
POLICY CHARACTERISTICS			
Policy Source *Perception of key stakeholders about whether the pay to participate policy is externally or internally developed.*	3a&b		
Evidence Strength & Quality *Stakeholders' perceptions of the quality and validity of evidence supporting the belief that the policy will have desired outcomes. (Fund school & programs)*	10&10a		
Relative Advantage *Stakeholders' perception of the advantage of implementing the intervention versus an alternative solution. (alt= cutting programs)*	5 6		
Adaptability *The degree to which an intervention can be adapted, tailored, refined, or reinvented to meet local needs.*	4	X	
Complexity *Perceived difficulty of implementation, reflected by duration, scope, radicalness, disruptiveness, centrality, and intricacy and number of steps required to implement.*	2 3		
Cost *Costs of the intervention and costs associated with implementing that intervention, what was the cost of the fee incurred to students?*	6 8 8	X	
Fund Utilization *Was there a process for delegating how funds are collected and used.*	8 9		
COMMUNITY PERCEPTION/IMPACT (Outer Setting)			
Community Needs & Resources *The extent to which student/community needs, as well as barriers and facilitators to meet those needs, are accurately known and prioritized by the organization.*	12a		
External Policies & Incentives *A broad construct that includes external strategies to spread interventions, including policy and regulations (governmental or other central entity), external mandates, recommendations and guidelines, pay-for-performance, collaboratives, and public or benchmark reporting.*	5a	X	X
SCHOOL/SCHOOL BOARD (Inner Setting)			
Policy Characteristics *History associated with policy development—specific to the community.*	1 2		X
Culture	11 12		

Norms, values, and basic assumptions of a given school/community.			
Implementation Climate *The absorptive capacity for change, shared receptivity of involved individuals to an policy and the extent to which use of that policy will be rewarded, supported, and expected within their school/community.*	11 12		
Tension for Change *The degree to which stakeholders perceive the current situation as intolerable or needing change.*	11 12		
Compatibility *The degree of tangible fit between meaning and values attached to the policy by involved individuals, how those align with individuals' own norms, values, and perceived risks and needs, and how the intervention fits with existing workflows and systems.*	2 3		
Relative Priority *Individuals' shared perception of the importance of the implementation within the organization.*	2 3		
Goals and Feedback *The degree to which goals are clearly communicated, acted upon, and fed back to staff and alignment of that feedback with goals.*	8 9 10		
Contributors to Implementation *Tangible factors and indicators of school need for funding to its decision to implement a pay to participate policy.*	5		
Leadership Engagement *Commitment, involvement, and accountability of leaders and managers with the implementation.*	3a		
Available Resources *State and local level effort to support school funding*	6 7	X	
Access to Knowledge and Information *Ease of access to digestible information and knowledge about the intervention and how to incorporate it into work tasks.*	3a&b		
PROCESS			
Planning *The degree to which a scheme or method of behavior and tasks for implementing an intervention are developed in advance and the quality of those schemes or methods.*	1 2 3		
Engaging *Attracting and involving appropriate individuals in the implementation and use of the intervention through a combined strategy of social marketing, education, role mapping, training, and other similar activities.*	3a		
Opinion Leaders *Individuals in an organization who have formal or informal influence on the attitudes and beliefs of their colleagues with respect to implementing the policy.*	12		
External Change Agents *Individuals who are affiliated with an outside entity who formally influence or facilitate intervention decisions in a desirable direction.*	3a&b		

Executing *Carrying out or accomplishing the implementation according to plan.*	10		
Unintended Consequences *Unplanned or unforeseen consequences of policy implementation*	14 15 16		
Reflecting & Evaluating *How the school and students may have been impacted by the policy. How the policy is measured as successful according to implementation team (school).*	10 13	X	X

APPENDIX C

COREQ CHECKLIST

COREQ (COnsolidated criteria for REporting Qualitative research) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Topic	Item No.	Guide Questions/Description
Interviewer/facilitator	1	Which author/s conducted the interview or focus group? Shelby Lautner
Credentials	2	What were the researcher's credentials? E.g. PhD, MD M.S.
Occupation	3	What was their occupation at the time of the study? Doctoral student
Gender	4	Was the researcher male or female? Female
Experience and training	5	What experience or training did the researcher have? 3.5 years of prior experience collecting qualitative data and training during doctoral program.
Relationship established	6	Was a relationship established prior to study commencement? Yes, they were introduced through a mentor
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research The participants knew the background of the researcher and the reason the study was being completed.
Interviewer characteristics	8	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic Reasons and interests in the research topic. No biases or assumptions were disclosed.
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis Community based participatory research, social ecological map, systems thinking, content analysis.
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball Participants were selected through snowball sampling.
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, Email Participants were approached via email.

Sample size	12	How many participants were in the study? Key informant interviews: N=8 Systems Building Validation Committee: N=11
Non-participation	13	How many people refused to participate or dropped out? Reasons? One, she did not believe she had expertise in the subject
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace The data was collected over the phone
Presence of non-participants	15	Was anyone else present besides the participants and researchers? No.
Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date All participants were involved in the school being studied whether they were employed by the school directly, the district, or if they were a volunteer. It is also important to note this was completed during COVID-19 of 2020.
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested? Yes, it was pilot tested with experts in the field.
Repeat interviews	18	Were repeat inter views carried out? If yes, how many? Not applicable.
Audio/visual recording	19	Did the research use audio or visual recording to collect the data? No.
Field notes	20	Were field notes made during and/or after the interview or focus group? Yes.
Duration	21	What was the duration of the inter views or focus group? Interviews lasted from 25-50 minutes depending on the participant.
Data saturation	22	Was data saturation discussed? Yes, among the research team.
Transcripts returned	23	Were transcripts returned to participants for comment and/or

Topic	Item No.	Guide Questions/Description
		correction? Phase II, the systems map, was returned to participants for feedback.
Number of data coders	24	How many data coders coded the data? Two.
Description of the coding tree	25	Did authors provide a description of the coding tree? Yes, this can be found in Appendix B.
Derivation of themes	26	Were themes identified in advance or derived from the data? They were identified prior to data collection. The Consolidated Framework for Implementation Research was used.
Software	27	What software, if applicable, was used to manage the data? NVivo.
Participant checking	28	Did participants provide feedback on the findings? Yes, through the systems map validation process.
Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number

		Yes. Each quote was identified by their stakeholder type (occupaption), but all other data was de-identified.
Data and findings consistent	30	Was there consistency between the data presented and the findings? Yes.
Clarity of major themes	31	Were major themes clearly presented in the findings? Yes.
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes? Yes.

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

Once you have completed this checklist, please save a copy and upload it as part of your submission. DO NOT include this checklist as part of the main manuscript document. It must be uploaded as a separate file.

APPENDIX D

CONTENT ASSESSMENT TOOL

Pay to Participate Content Assessment

1. Content Type

   Mark only one oval.

   - ◯ School document
   - ◯ News article
   - ◯ Other: _____

2. Year Published

   _____

3. Sentiment

   Mark only one oval.

   - ◯ Neutral
   - ◯ Negative
   - ◯ Positive

4. Did the media piece mention lower income students?

Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Not relavant

5. Insight to community tone/feeling/opinion

6. Notable Quotes

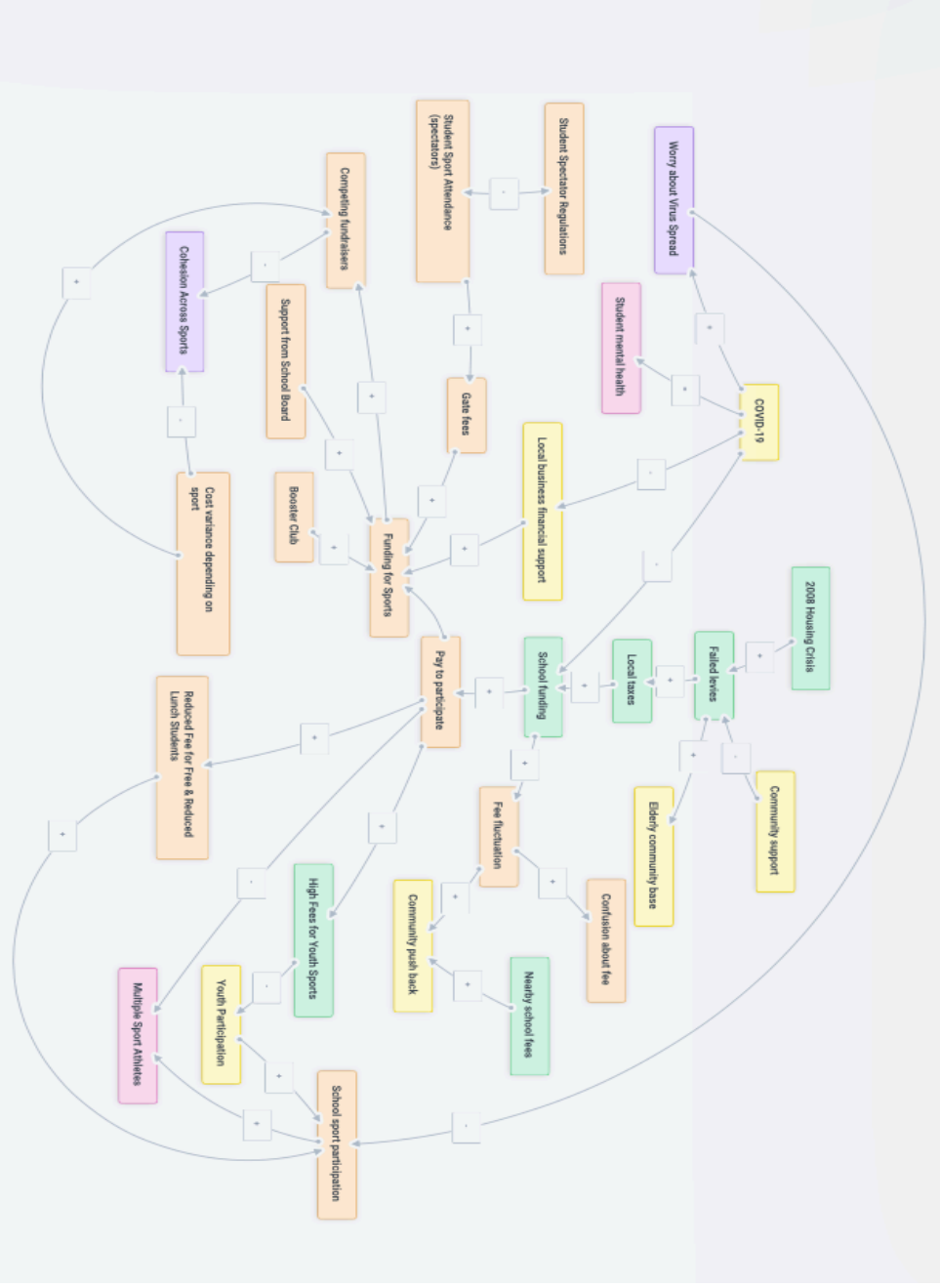
This content is neither created nor endorsed by Google.

Google Forms

APPENDIX E

CAUSAL LOOP DIAGRAMS

1- Causal loop diagram prior to validation



2- Causal loop diagram after validation