Old Dominion University
ODU Digital Commons

STEMPS Theses & Dissertations | STEM Education & Professional Studies

Summer 8-2022

Diffusion of Public Library Innovations: A Case Study on Parking Lot Wi-Fi Hotspots Diffusion Development

Samantha Laine Hull
Old Dominion University, hull.samanthalaine@gmail.com

Follow this and additional works at: https://digitalcommons.odu.edu/stemps_etds

Part of the Curriculum and Instruction Commons, and the Library and Information Science Commons

Recommended Citation

Hull, Samantha L.. "Diffusion of Public Library Innovations: A Case Study on Parking Lot Wi-Fi Hotspots Diffusion Development" (2022). Doctor of Philosophy (PhD), Dissertation, STEM Education & Professional Studies, Old Dominion University, DOI: 10.25777/q9zz-ee93
https://digitalcommons.odu.edu/stemps_etds/129

This Dissertation is brought to you for free and open access by the STEM Education & Professional Studies at ODU Digital Commons. It has been accepted for inclusion in STEMPS Theses & Dissertations by an authorized administrator of ODU Digital Commons. For more information, please contact digitalcommons@odu.edu.

DIFFUSION OF PUBLIC LIBRARY INNOVATIONS: A CASE STUDY ON PARKING LOT WI-FI HOTSPOTS DIFFUSION DEVELOPMENT

by

Samantha Laine Hull
B.A. December 2010, Lebanon Valley College
M.S.L.S. August 2014, Clarion University of Pennsylvania

A Dissertation Submitted to the Faculty of
Old Dominion University in Partial Fulfillment of the
Requirements for the Degree of

DOCTOR OF PHILOSOPHY

INSTRUCTIONAL DESIGN AND TECHNOLOGY

OLD DOMINION UNIVERSITY
August 2022

Approved by:

John Baaki (Director)

Amelia Anderson (Member)

Jori Beck (Member)

ABSTRACT

DIFFUSION OF PUBLIC LIBRARY INNOVATIONS: A CASE STUDY ON PARKING LOT WI-FI HOTSPOTS DIFFUSION DEVELOPMENT

Samantha Laine Hull
Old Dominion University
Director: Dr. John Baaki

Public libraries have begun to provide services well beyond books and online databases. Prior to the pandemic, many libraries expanded their collection to include items like power drills or board games in their circulation. They also started partnering with social service organizations to better serve their patrons' needs beyond those that are educational and entertainment based. Despite being broadly trusted by most people and having clever and innovative ideas, some public libraries' budgets and time limits left marketing efforts at a minimum. In order to address the communication problem many public libraries face, in this study I sought to align Diffusion of Innovations (DOI) theory elements with public library staff's promotional efforts.

I served as a subject matter expert and participant-observer in this exploratory case study. The study focused on an innovation that has already been developed but was not being widely used in a medium sized public library in Pennsylvania. I worked with library staff who were employed by the public library to inform and help develop a diffusion plan.

The results of this study are thematic and broadly offer evidence that public library staff can utilize components of DOI theory for promotional efforts. The study was a three-phase process that allowed the library staff to discover the importance of dedicated time and people as well as clear directions and defined roles. Identified obstacles include sustainability and communication breakdowns. The library staff identified the most important DOI characteristics when diffusing an innovation as relative advantage and complexity.

Keywords: Diffusion of Innovations; public library promotional efforts; diffusion design; innovative libraries, public Wi-Fi

Copyright, 2022, by Samantha Laine Hull, All Rights Reserved.

This dissertation is dedicated to all those who have helped me honor the path I have chosen. And especially to AJ, O, & CC who have lifted me up when I needed it and left me alone when I desired it. The journey has only begun.

ACKNOWLEDGMENTS

There are many people who have contributed to the successful completion of this dissertation. I want to thank Dr. John Baaki for tough love moments and a continued belief in my abilities and strength. I cannot put into words how much your sustained belief in me and my project has meant throughout this long journey. A big thanks to Dr. Amelia Anderson who knows the value and importance of the services and resources libraries everywhere can and do offer everyone. Your insight helped give life to the potential future application of this work. And of course, Dr. Jori Beck, thank you. I felt a kinship towards you during the first day of class with you and it had so much to do with your ability to build meaningful relationships. Your honesty and support have given me strength and the desire to make the work I do worthwhile and relevant. In addition to my committee, I want to thank the EASD library staff and EPL library staff who have supported me in ways I did not always know I needed. Andrew, Oliver, and Cecily, thank you for honoring the sacrifice of time with me during this process. Mom and Dad, thank you to the many unannounced babysitting sessions and allowing me to talk through my process. My family, my friends who are like family, you all have championed me in ways that gave me courage every day. All of you, and the many who I did not name, make up my village. I am forever grateful.

NOMENCLATURE

Change agency	An organization or institute that brings about change through innovation
Diffusion	A specific type of communication about a new idea, product, or behavior that takes place over time and throughout a society
Innovation	An idea, practice or object that is received as new by an individual
Library(ies)	Refers to public libraries, branches and systems in the United States
Patron	A person who uses the services of a library (physically or digitally)
Outreach	A department of librarianship that focused on services for those who are infrequent library users or nonusers or for those who are traditionally underserved
Wi-Fi hotspot	A device that acts as an internet access point, allowing connection to a Wi-Fi network using a device

TABLE OF CONTENTS

Page

LIST OF TABLES xiii

LIST OF FIGURES xiv

INTRODUCTION 1

Public Library Value 2

Public Library Programs 4

Essential Resources 5

Diffusion of Innovations 8

Study Focus 9

Research Questions 10

Delimitations 10

Study Significance 10

Summary 12

LITERATURE REVIEW 13

Background on the Research 13

Libraries 15

Innovative Libraries 16

Library Outreach 19

Information Seeking Behavior. 21

Program Implementation 22

Diffusion of Innovations 24

DOI in Libraries 27

DOI and Public Health 28

DOI in Libraries and Healthcare 29

DOI in Similar Environments 30

Designing for Diffusion 31

Collaborative Design 32

Audiences 32

Stimulators and Barriers 33

Innovative Attributes 33

Communication Channels. 34

Summary 35

METHODS 36

Context of the Study 36

Design 37

Case Study Design 38

Framework Applied 40

Mission and Goal 40

Researcher's Identity Memo 41

Methods 42

Protocol Questions 42

Case Selection 43

Participant Selection 43

Confidentiality 46

Data Collection 46

Participant Information Session. 47

Documentation. 48

Interviews. 48

Participant-Observation. 49

Focus Groups. 51

Analysis 52

Trustworthiness 54

Study Limitations 55

FINDINGS 56

Research Questions 58

Data Analysis 59

Research Question One 59

Group Work and the Importance of People. 60

Extended, Focused Time. 62

Terminology. 64

Future. 65

Procedural Details. 66

Barriers. 67

Ease of Implementation. 67

Summary of Themes. 67

Research Questions Two and Three 68

Cost. 68

Public Trust. 69

Barriers. 70

Ease of Implementation. 71

Summary of Themes. 72

Research Question Four 73

Communication. 74

DOI Characteristics. 76

Summary of Themes. 77

Summary 77

DISCUSSION AND CONCLUSIONS 79

Discussion 79

Diffusion Plan Process 80

Dedicated People and Time. 81

Clear Directions and Definitions. 83

Sustainability 84

Applicable Elements of DOI Theory 85

IDT in Public Library Programming 88

Conclusion 89

Future Research 92

Recommendations 92

Logic Model 92

References 95

APPENDIX A 109

APPENDIX B 110

APPENDIX C 111

APPENDIX D 112

APPENDIX E 113

APPENDIX F 114

APPENDIX G 116

APPENDIX H 117

VITA 118

LIST OF TABLES

Table Page

Participant Overview 45

Data Collection Plan 47

Data Collection Timeline 51

LIST OF FIGURES

Figure Page

Entire Diffusion of Innovations Theory, Applied to This Study 15

Public Library Patron's Innovation-Decision Process 40

Anticipated Logic Model for Public Library Outreach with DOI 53

Logic Model for Public Library Outreach with DOI 93

CHAPTER I

INTRODUCTION

Public libraries are well-established community anchors, and many provide the foundational key to the United States of America's social infrastructure (Olin, 2019). The "future health of democracy" depends on places like public libraries; the strength of a social infrastructure is evident in neighborhoods that are thriving and are ones that often have a quality public library. As a public library is one of the few places that is open to all and requires no purchases or annual fee (Howard, 2019), it is no surprise that 94% of Americans consider public libraries welcoming, friendly places (*How Americans*, 2013). Public libraries are a first stop for many when it comes to educational, financial (tax help, budgeting courses, etc.) and personal needs (including entertainment), yet there are people who do not realize the depth of resources, assistance, and connections that public libraries provide (Olin, 2019). Though libraries have connected with patrons using various communication channels and outlets, particular elements of the diffusion process and communication can increase the awareness and later use of new ideas or innovations (Rogers, 1995).

Rogers' (2003) Diffusion of Innovations (DOI) theory combines the process of diffusion and the rate of adoption. The diffusion process and rate of adoption could and do stand alone as theories. The diffusion process comes after an innovation has been developed and includes the innovation-decision process. An individual (or other decision-making unit) goes through a process that occurs over time and involves several different actions. Only at the end of the innovation-decision process does adoption potentially occur. Adopters are categorized into five ideal types (innovators, early adopters, early majority, late majority, and laggards) with their own particular characteristics that may influence adoption such as socioeconomic status, personality

traits and communication behaviors. Innovations themselves have attributes that affect their rate of adoption. Rogers (2003) suggests that potential adopters perceive five attributes when considering adoption: relative advantage, compatibility, complexity, trialability and observability.

Public libraries have an opportunity to influence the rate of adoption of their programs and services by applying elements of DOI theory, such as innovation attributes, to their outreach efforts. Outreach can be further optimized by recognizing the importance of diffusion networks and how communication flows within a social system. This type of forward-looking research provides a basis to position an innovation, so it is more acceptable and rapidly becomes adopted (Rogers, 2003).

Public Library Value

Public libraries aim to support their communities through providing a welcoming, safe place for unique programming and opportunities for informal learning or entertainment (Zalusky, 2020). Those who use public libraries have recognized the value in the state and locally funded community hub, so much that attendance for free public programming has increased over the years. Libraries have always explored ways to enhance their services and provide lifelines to their patrons. Since the dawn of the pandemic, as many library patrons dealt with one difficulty after another like job loss, remote work and learning, and information about the looming healthcare crisis, the assistance and support of their public library became even more valuable. Libraries work to provide free access to accurate information to all people, and in many parts of the US, the public library is the only place for underrepresented, marginalized and vulnerable community members to have access to information through printed materials, online resources, and in house Wi-Fi (Howard, 2019; Zalusky, 2020). Although the first lending library in

America began with Ben Franklin's donation of books, the spread of these institutions took off after the Civil War (*A History*, n.d.). Though the history of public libraries in America has not always been inclusive, even the first public libraries sought to be open for all without charge and focused on the needs of the general public. Many were board-governed and tax-funded. As the needs for the public shift, public libraries seek to continue to meet the needs of their patrons. For example, the Los Angeles Public Library system logged over four million Wi-Fi sessions during the 2018 fiscal year (Howard, 2019). Though Wi-Fi is available for all patrons, many of the Wi-Fi sessions support households with annual income below $30,000 (Garmer, 2014). More recent data highlight that 77% of Americans have home broadband access, but 30% say they have problems connecting when at home (Perrin, 2021). Furthermore, race and ethnicity are indicators as to whether Americans have access to broadband and computers in their homes (Atske & Perrin, 2021).

Libraries are among the most trusted institutions and visiting the library is among the most common cultural activities Americans engage in (Howard, 2019; Zalusky, 2020). Garmer (2014) wrote that public libraries are built around three key assets: people, place, and platform. This notion drives library staff engagement with all community members both digitally and face-to-face in a user-centered manner. As community organizations that support the needs of their patrons, libraries deliver innovative resources and programs to work towards creating equitable societies (Horrigan, 2016; Howard, 2019; Zalusky, 2020). Vårheim et al. (2019) recognized public libraries as public sphere institutions orienting around the themes of community, management and funding, institutional structures and practices, new tools and services, and knowledge organization. Regardless of the work of Vårheim et al. (2019), public library employees recognize needs in their communities because they are often present for their

community members in times of need (Zalusky, 2021). In recent reports from the American Library Association, programming has grown from story times and spreadsheet how-to sessions and many libraries now offer programming to assist with health insurance, trauma-informed care, and learning about intellectual property (Zalusky, 2020).

Public Library Programs

The cross section of visitors whom public libraries attract means a variety of programs and services must be provided to meet the needs of everyone. Educational and parent engagement are common themes for programs, but more recently programs aimed at health and wellness, social services, digital literacy, skill development, and small business support have become popular (Zalusky, 2020). Library staff act and react to the needs of the community by providing a litany of resources and programs such as story times, research projects, and even assisting someone in securing shelter for the night (Howard, 2019). Programs such as knitting clubs, bilingual story hours, and specialized programs for immigrants on adjusting to life in the United States of America are examples of the innovative programs found in a modern public library (Dixon, 2017; Howard, 2019). Often these programs are successful because they are collaborative through a partnership with other organizations and community businesses. Furthermore, years of research confirm the role public libraries serve as the information intermediary between e-government and patrons (Stevenson & Domsy, 2016). As an institution that many Americans trust, more specifically, a trust in librarians because of their ability to curate and share reliable knowledge (Howard, 2019; Horrigan, 2016), many people rely on their local libraries to provide assistance for various needs (Zalusky, 2020). This is especially true for underserved patrons who may not be able to access information or resources from any other outlet. Goytia et al. (2005) found that librarians often “provide a cultural and linguistic bridge to

underserved populations" (p. 19). Community partnerships allow resources to be leveraged in a way to create a greater impact on all library patrons (Garmer, 2014). Public library programs and services are innovative, but the innovations are often pushed out using incomplete or inappropriate marketing strategies that do not reach all patrons (Reid, 2017). The strategic partnerships that public libraries forge when developing, promoting, or revitalizing a program often lead to successful programs because of the unintentional use of variables that Rogers (2003) highlights in DOI theory.

Essential Resources

Libraries often bridge the gaps with community needs and partner with community and social services to provide programs to get taxes completed for free, serve as hubs for those experiencing homelessness, and sometimes even serve as opioid safe havens. Public libraries provide resources to patrons, many of whom do not have reliable or direct access to information or services. Some resources are more utility based, like a safe place to be inside for the day, air conditioning during warmer seasons and internet connections. Public library staff are often trained and prepared to deal with patrons in crisis or in need within the moment (Zalusky, 2021). There are limitations to what a public library and its staff can provide community members experiencing homelessness or substance abuse so many libraries have community partnerships where referrals can be made to expedite the process or have social workers on staff (Dowdell & Liew, 2019; Giesler, 2017, 2019; Provence, 2020). Public libraries have worked to close the gap in the digital divide as a free resource that offers access to the internet, devices, and training (Beaunoyer et al., 2020), but library services are not widely known throughout the pockets of the community that could most benefit. A more granular application of communication theories in public library outreach may serve to reach community members with the most need (ALA Office

for Diversity, Literacy and Outreach Services, 2019; Costello & Keyser, 2016; *Developing and Implementing*, 2020; Sikes, 2019; Velez et al., 2020).

As a current example, the COVID-19 pandemic highlighted the flaws of communication techniques for specific audiences (Kirchner, 2020). The digital divide grew substantially during the mandated shutdowns during the COVID-19 pandemic (Beaunoyer et al., 2020; Vogels et al., 2020). The digital divide is the gap between those who have access to computer technology and information available through the internet from those who do not have regular, reliable access (Kreps, 2005). More than half of Americans reported that the internet was essential during the COVID-19 outbreak, and another 34% say it was important, but not essential (Vogels et al., 2020). Furthermore, many Americans did not have sustainable internet sources during that time, including two thirds of Americans in rural areas and Americans with household incomes under $30,000 (Kirchner, 2020). Many libraries got creative with their services and offered more digital content such as eBooks and magazines as well as shifted traditional face-to-face programs to platforms like Facebook (Ashworth, 2020). One of the ways libraries were able to respond to community needs during mandated closures was to provide Wi-Fi hotspots. The Public Library Association (PLA) survey found that 81% of libraries were leaving Wi-Fi on when the building was closed, despite 98% of the brick-and-mortar libraries being closed to the public (Kimball, 2020; McDonald, 2020). Additional routers were placed in parking lots, school buses and community parking lots to extend the reach of the network to as many users as possible (Kimball, 2020). Some libraries were ahead of the curve and already offered Wi-Fi hotspot checkouts. In libraries like DeKalb County Public Library (DCPL) in Georgia, initiatives like "Take the Internet with You" allowed patrons to check out Wi-Fi hotspot devices for their homes for 21 days (Joplin, 2020). With over 200 hotspots in circulation, DCPL was able to provide

internet access to patrons, 50% of which did not have access to the internet in their homes. Other libraries found ways to connect with patrons in atypical ways and locations such as extending services and resources online, curbside pick-up, communicating via social media about changes in library services, COVID-19 information, and census participation (McDonald, 2020; Public Library Association, 2020).

Libraries have become known as second responders during times of crisis in their communities by staying open, bringing in medical staff and counselors, and even offering shelter (Beaunoyer et al., 2020; Fallows, 2020). When traditional library services migrated online during the pandemic, staff found other innovative ways to serve their communities by hosting drive-through food pick-ups, 3-D printing of personal protective equipment, and keeping people productive and informed (Fallows, 2020). Though many patrons benefitted from the innovative programs public libraries offered (Howard, 2016), the information did not spread to all community members.

Public libraries have long been considered innovative and have provided education, entertainment, and essential resources to their communities, but if the community does not reciprocate by utilizing the innovations, promoting or discussing the innovations with interpersonal connections, or advocating for the longevity of public libraries, the ability for public libraries to adapt is limited (Wojciechowska & Topolska, 2021). Some libraries have expanded their staff to include social workers who are trained to assist individuals in specific situations which takes some of the pressure of library staff to handle a patron in a mental health crisis (Benson, 2022; Wahler et al., 2019). Other libraries often trainings for their staff on events like a drug overdose or an patron experiencing homelessness who is becoming angry (Swenson, 2019).

Diffusion of Innovations

Diffusion of Innovations (DOI) theory is used to explain why, how, and the rate at which new ideas or products spread through society. DOI originally appeared in 1962 after Everett M. Rogers completed his dissertation and argued that diffusion was a process, regardless of the innovation, adopters, place, or culture (Rogers, 2003). Diffusion is defined by the process of an innovation being communicated to society over time. The main elements include innovation, communication channels, time, and the social system. The innovation does not need to be a brand-new invention, simply a new idea or concept for a particular group. Furthermore, communication channels play an important role throughout the diffusion process as change agents, or those advocating for the innovation, may opt to use mass media as well as interpersonal channels, but the potential adopter may be influenced by other communication channels as they make the decision to adopt or reject the innovation. Adopter categories (general characteristics of people who adopt innovations based on an S-curve), diffusion networks, and the innovation-decision process are factors in the diffusion of an innovation. As a public institution, time, social system, and adopter categories are often outside the public library's control, highlighting an opportunity to intervene within the specific part of the innovation-decision process.

Adoption (or rejection) occurs at the end of the innovation-decision process (Rogers, 2003). Once an individual (decision-making unit) learns of an innovation and forms an opinion based on innovation characteristics, they decide to adopt or reject the innovation. Further implementation and confirmation can occur, but so too could later adoption or discontinuance.

Diffusion research often focuses on potential adopters' (people) characteristics, while the innovation characteristics and the development of diffusion plans are less frequently studied,

though more recently studies on innovation characteristics have also added to the literature (Dearing, 2009; Rogers, 2003). Despite many great programs and initiatives created by public libraries there remains a kink in the communication and promotional efforts, which could likely be enhanced by the application of elements of DOI theory. With a full implementation of the DOI theory, Rogers (1995) believed the rate of adoption would be increased. The missing element in public library outreach is not how to develop programs, but it may be how to diffuse them. Rogers' (2003) work can be applied in the implementation phase of instructional design and performance improvement to increase the knowledge, understanding, and likelihood of use and adoption of an innovation.

The public library staff in this study has relative control over the perceived attributes of their innovations, communication channels (mass media), and their promotion efforts as change agents. Due to the mission of public libraries to serve patrons who belong to varying adopter categories, change agent efforts will provide more useful information when developing diffusion plans for library innovations. This is further compounded by prior research on innovation attributes and communication channels (Brownson et al., 2013; Dearing & Kreuter, 2010; Dearing & Singhal, 2020; Musa et al., 2015; Philbin et al., 2019; Valier et al., 2008).

Study Focus

This study focused on the process of public library staff developing a diffusion plan for parking lot Wi-Fi hotspots (innovation) based on Roger's DOI theory. As DOI theory includes various components, the study only focused on the change agent's (public library) efforts of communicating the innovation's attributes through various channels. The study focused on staff at one public library as they implemented one innovation (parking lot Wi-Fi). I played the role of the subject matter expert and worked with public library staff to develop the diffusion plan using

DOI as a framework. The study was a qualitative case study with data collected throughout the process including interviews, field notes, and focus groups.

Research Questions

RQ 1: How did public library staff develop a diffusion plan to implement parking lot Wi-Fi hotspots using DOI theory?

RQ 2: How did public library staff address stimulators when developing a diffusion plan to implement parking lot Wi-Fi hotspots using DOI theory?

RQ 3: How did public library staff address barriers when developing a diffusion plan to implement parking lot Wi-Fi hotspots using DOI theory?

RQ 4: Which DOI innovation attributes did public library staff find most applicable to diffusing parking lot Wi-Fi hotspots and why?

Delimitations

The intent of this study was to explore the use of Roger's DOI theory in public library practice. As noted above, public libraries offer many services to their patrons. This study had a primary focus on staff as they developed a plan to diffuse an innovation: parking lot Wi-Fi hotspots. The study focused on staff at one public library branch that is part of a county-wide public library system but operates autonomously in many ways. The study included data collection techniques to provide in-depth analysis of the process through interviews, field notes, and focus groups.

Study Significance

The study filled a gap of diffusion research that pertains specifically to public libraries. As of 2021, a search of the literature showed that a diffusion design study on public library innovations has not yet been conducted. The literature showcases the innovative efforts of public

libraries well, but the communication and promotional efforts lack intentional elements of diffusion. DOI can provide guidance on communication and promotional efforts to diffuse innovations more successfully, during times of crisis and calm. Public libraries need to do more than analyze their community needs to design and develop innovative programs; they need to implement programs to reach more of their community, specifically those who have needs that can be met by library services. As institutions that often have budgets that are piecemeal funded from donations and state and local budgets that are ever shrinking, public libraries are often asked to do more with less. Though public libraries already have outreach services and programs to meet the needs of their patrons, the implementation of DOI theory to public library outreach can provide an opportunity to reach more community members, better reach intended auidences, and increase positive advocacy support.

Instructional design often follows the Analyze, Design, Develop, Implement, Evaluate (ADDIE) process. The *implement* phase proves to be challenging in public library environments. DOI theory brings an understanding to the implementation step that there are particular elements that stimulate adoption and others that may present barriers. The findings of this study may guide libraries through efficient and effective program implementation. Improvements in library staff skills and knowledge of how to effectively communicate and diffuse programs, services, and outreach will likely improve patron services, and could lead to greater stakeholder involvement and funding opportunities. The current study focused on the diffusion of parking lot Wi-Fi hotspots and three of the five variables that determine the rate of adoption: perceived attributes of the innovation, communication channels, and extent of change agents' promotion efforts.

Summary

Public libraries have access to a lot of up to date and reliable information, especially during a time of crisis in a community. People trust public libraries for reliable information and resources to seek out answers to questions regarding all facets of their livelihood. Diffusing reliable information, whether about an innovation, a new library program, or public health information, can be seen as the responsibility of the public library. As much as public libraries have prevailed as community hubs, their role has shifted, and they have become more innovative. By applying DOI theory to public library outreach efforts, public libraries might be able to focus on the attributes important to their community and ultimately increase their reach through various communication channels. Chapter two will review the DOI and diffusion literature as well as library outreach literature.

CHAPTER II

LITERATURE REVIEW

This section will begin with an overview of public libraries, focusing on innovations at public libraries, current library outreach, and program implementation practices. The second section will include the history, components, and implications of Rogers' Diffusion of Innovations (DOI) theory. It will develop into an explanation of the diffusion process, and I will discuss relevant diffusion efforts in libraries, the health sector, partnerships with public health, and public libraries and similar environments. Next, the review will address the research on designing for diffusion including topics like collaborative design, audiences, stimulators and barriers, and innovative attributes.

Background on the Research

There is little to no research on effective diffusion of public library outreach innovations. In fact, no specific studies were uncovered during rigorous searches using a variety of databases including Academic Search Complete, Education Research Complete, Library Literature & Information Science Full Text, and Psychology and Behavioral Sciences Collection. Google Scholar, a scholarly literature search engine, was also unable to unearth any studies focusing on the diffusion of public library innovations. The keywords used in these searches included: "diffusion of innovations," "public library or public libraries or public library services," and "outreach programs or outreach services or community outreach."

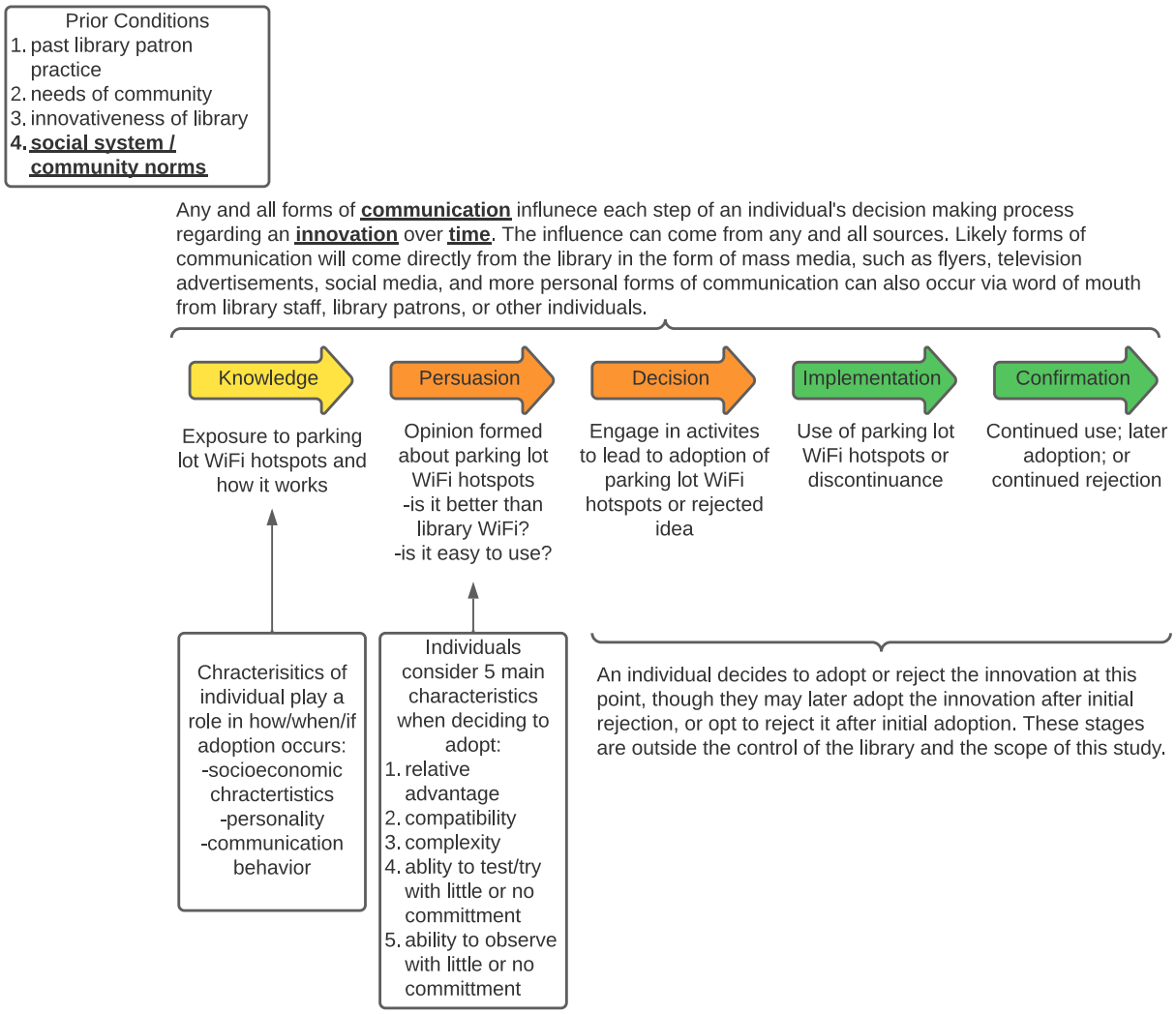
Using the same databases mentioned above, a search that included keywords of "attributes," "innovation," and "Rogers" yielded 70 results since 1978, while Google Scholar yielded an astonishing 68,800 results when filtered to only include results from 2000-2021.

These results included works that were not specific to Rogers' theory as well as books and other publications that were not directly relatable to the context of this study.

There have been several studies on increasing the likelihood of adoption in fields such as public health (Dearing, 2009; Dearing & Kreuter, 2010), nursing curricula (Doyle, et al., 2014), public policy and health campaigns (Goldman, 1994; Makse & Volden, 2011), as well as scales to measure perceptions of adoption (Moore & Benbasat, 1991; Tornatzky & Klein, 1982). There have also been efforts to partner with outside entities to extend outreach to patrons through a trusted institution, such as a library (Goytia, et al., 2005; Johnson, 2019; Philbin et al., 2019). Figure 1 outlines a model of the entire Diffusion of Innovations theory as applied to this study. The first stage of the Diffusion of Innovations has a heavy focus on communication. For the purposes of this study, the communication strategies the library implements were the focus. The second two stages will rely on the individual's decisions. The library, or the change agent, can influence the individual's decision by considering the five main characteristics that the individual will also consider: relative advantage, compatibility, complexity, trialability, and observability. The final two stages were outside the scope of this study and are iterative. As I discuss innovation in libraries, specific elements of DOI will be brought up but Figure 1 shows the entire process in a simplified format.

Figure 1

Entire Diffusion of Innovations Theory, Applied to This Study



Note. **Adapted from Rogers (2003).**

Libraries

In the United States, public libraries are institutions that are available to everyone, regardless of status or any other qualifier. Their services vary from location to location based on community needs. Successful libraries serve their communities by providing individualized assistance while maintaining relationships and building trust (Johnson, 2012). The American Library Association's (ALA) State of America's Libraries reports that libraries embrace parental engagement, promote wellness and health, and drive economic opportunity (Zalusky, 2020).

Although shelves of books come to mind at the thought of a library, current Los Angeles County Library system director, Skye Patrick, said, “Libraries are not about books, they’re about people,” (Howard, 2019, para. 32).

Libraries have transformed their approach to provide services, resources, and programs for their patrons. From supporting the shift to internet-based browsing and resources to recognizing community needs, the public library has adapted despite annual budgets that have not grown to match the services provided (de Greef et al., 2020). Perhaps due to the pressure to remain relevant and vital to their communities, libraries have become innovative in many different ways.

Innovative Libraries

Innovation has a variety of definitions, even within the field of librarianship. Gorham and Bertot’s (2018) review found that many studies of innovations in public libraries involved access to information, technology, services, support and expertise to better serve patrons and the entire community. For the purposes of this literature review, Rogers’ (2003) definition of innovation was used, which is an idea, practice or object that is received as new by an individual. As previously mentioned, public libraries must be innovative in times of budget cuts that result in staff and resource shortages and challenge libraries to remain relevant (Potnis et al., 2020). Further, innovations can serve as the impetus for patron engagement which ultimately justify funding for services. Potnis et al. (2019) found four distinct types of innovations within the public library sphere: program, process, partnership, and technology. The study revealed that each type of innovation included subcategories with unique goals. For example, a program innovation that was use-oriented would ensure the use of the service or facilities, such as a collaborative technology center that offered expert training on productivity software or robotics.

A very popular innovation in the library landscape that included all types of innovations was the makerspace (Potnis et al., 2019). As technology like computers, software, and robots became more accessible to the general public, many libraries built makerspaces within their walls. While no two makerspaces are the same, many include expensive software, 3D printers, and laser cutters (Forsyth et al., 2020). Other makerspaces have a low-fi focus on materials, such as textiles and craft materials or incorporate local experts for workshops and programs (Forsyth et al., 2020). Makerspaces provide risk-free educational environments for people to test, trial, and learn in hands-on ways that may not otherwise be accessible to them. Pichman (2019) believed that the next iteration of library makerspaces are solverspaces, that is turning the tinkering into solutions for global or local problems. Many libraries still facilitate and offer makerspaces within their programming because they were inadvertently developed with a consideration of aspects of DOI theory, such as relative advantage and complexity. As there is a lot of overlap with current marketing practices and DOI theory compounded by the lack of literature specific to library programming and DOI theory, it can be assumed that the use of some DOI elements in successful library programming is occurring coincidently. Although this is likely coincidental, makerspaces provide unique experiences for communities to tinker and learn in a hands-on and low risk way (Forsyth et al., 2020). For instance, makerspaces were created to provide open access to tinker and experiment with equipment that is generally not available to the general population. The makerspace innovation was developed by recognizing that public desire. More specifically, attributes of makerspaces align with Rogers' attributes of innovations by having a relative advantage over not having access to machines and software, the trialability factor allows for patrons to use as much or as little of the space as they desire, and makerspaces are set up for easy observability as they are located in public spaces.

Innovation has had a home in libraries for decades and has largely benefitted the patrons (Huwe, 2020). Even the physical space of the library, from a quiet study area that only has books on the shelves to spaces that support all types of library users, showcases an example of innovation in the libraries. A further example of innovative changes in the library system is the unique spread of materials to borrow from the over 17,000 public library branches in the United States of America such as fishing rods, cake pans, instruments, and telescopes that have been acquired to offer opportunities to provide education and entertainment (Charles, 2012; Garmer, 2014). Innovative services such as circulating non-traditional materials like scrapbooking kits and power tools also provide opportunities for partnerships with other community organizations (Charles, 2012).

Innovations have also grown from library staff recognizing technology needs within their communities such as initiatives like *Mobile Max* that brought access to information, Wi-Fi hotspots, charging ports, and access to social and cultural information to outdoor spots where subgroups of a particular community often are (Gibson et al., 2019). In a broader context, the COVID-19 pandemic highlighted equity gaps in communities across the world. Many people depend on their public library for internet access: over 91% of people claim to know where their closest or neighborhood public library is located, and 56% of people say the public library's technological resources (computers, internet) are especially important to them and their family (*How Americans*, 2013). Innovative services such as virtual story time and other programming, enhanced digital content, online library card sign up, and Wi-Fi hotspots were offered to all community members during mandated shutdowns (Ashworth, 2020; Public Library Association, 2020). Despite a variety of services libraries offered, Beaunoyer et al. (2020) found that COVID-19 increased vulnerability within the population of people who already faced digital inequality.

The study revealed recommended strategies to mitigate the impact the pandemic has on subgroups of patrons by increasing access to resources (physical and digital), digital literacy, and access to support, which are steps that public libraries have been taking (Beaunoyer el al., 2020; Public Library Association, 2020). Beaunoyer et al. (2020) further suggested an increase in studies on the diffusion of the information about the services, which has been highlighted as a current gap in the literature.

Library Outreach

As public libraries are built to serve everyone, the strategies used to reach their audiences are often unique and are regularly rooted in social capital through interactions and relationships (Johnson, 2012). Many people have positive associations with their public libraries and trust them as institutions (Cabello & Butler, 2017; Costello & Keyser, 2016). Engaging public library patrons is important for statistics that drive grants, subsidies, and other ways that public libraries receive funding (Zalusky, 2020). Studies highlight the fact that different subgroups of patrons utilize public libraries at different rates (Costello & Keyser, 2016; *How Americans*, 2013). Costello and Keyser (2016) found that the engagement levels of audiences vary by age or current life experiences (parenthood, retirement, etc.) and are motivated by specific reasons. In their study, outreach efforts varied from social media to trusted newsletters. Sikes (2019) further illustrated that point through a study on elderly library users who have specific needs for information, entertainment, and quality of life standards. ALA (2019) also tailored recommendations for reaching older adult public library users, such as gathering information on the demographic and community, reviewing the library's strategic plan along with feedback from the community, as well as identifying community partnerships that could enhance the goal and share a similar mission. Johnson (2019) found that partnering with community organizations,

specifically professional social workers, can expand programming and strengthen outreach efforts for all library patrons, but particularly marginalized patrons. Similarly, Velez et al. (2020) found that the priorities and needs of Hispanic communities also need to be uniquely addressed with outreach services. Barriers to access, programming that addresses specific needs, and staff who can authentically connect and communicate with patrons are all topics to consider when working with the Hispanic community and any specific subgroup of patrons. Although Velez et al. (2020) and Sikes (2019) focused on specific communities and subgroups, their similar results lead to the interpretation that they can be generalized to various audiences for library outreach as good communication strategies and ones that illustrate DOI elements, though not explicitly. ALA recommends drafting a communication plan with goals, audience, and key information with public library staff before attempting to gain attention (*Developing and Implementing*, 2020).

Traditional trends in outreach services, such as home delivery, interlibrary loan, and bookmobile services are still popular among public libraries (Yarrow & McAllister, 2018). New services, such as kiosks, remote collections and pop-up libraries will continue to grow based on demand or local initiatives. Innovation is present in the outreach strategies and can serve to engage new patrons. Specifically, the COVID-19 pandemic forced outreach services to alter their typical procedures for safety reasons. It became clear that outreach services needed to be reframed to include all patrons, including those who do not have reliable internet access at home or reliable transportation to library buildings. Programs like outdoor story walks, activity kits to-go, and circulating Wi-Fi hotspots were adapted to meet some of the needs of patrons in an unprecedented time (Wyatt, 2021). Database requirements and extended library card expiration dates were additional examples of outreach services libraries provided during mandated shutdowns (McDonald, 2020).

Information Seeking Behavior. Information seeking behavior models should be considered when performing outreach services as they include components of DOI theory. As public libraries often offer everyday life information, Savolainen's (1995; 2017) and McKenzie's (2003) studies and model of information practices in accounts of everyday-life information seeking can provide further recommendations on how best to approach audiences, or in the case of DOI theory, adopter categories. Libraries provide services in response to their patrons' needs, and most libraries serve communities with patrons who identify in diverse categories, including socioeconomic status, education level, and citizenship (Costello & Keyser, 2016). A foundational understanding of audiences' information-seeking behavior will help public libraries plan innovations and diffusion plans with the furthest reach and most impact.

Specific to the role public libraries play for most of their patrons, the everyday life information seeking framework can provide insight into the behaviors of individuals seeking information in a personal manner (Savolainen, 2017). Savolainen identified many problem areas for everyday life information seeking individuals: neighborhood, consumer habits, housing/household maintenance, crime and safety, education, employment, transportation, health, recreation, discrimination, financial, legal, and public assistance. Information-seeking behavior models are valid information, but it implies that an individual is knowingly seeking information. It is essential to consider patrons might not even know what they are looking for and should still have the means to find it.

An applicable model for public library patrons' information-seeking behavior is McKenzie's model of information practices because it has four modes that would characterize most public library patrons. The four modes of information practices are active seeking, active scanning, non-directed monitoring, and by proxy (McKenzie, 2003). The model was developed

through a study in which many library users did not fit into the present two-dimensional models. Each mode of McKenzie's model has a different connecting and interacting phase. An individual in active seeking mode directly looks for an identified source and uses questioning strategies to locate information. Active scanning is less direct and can be described as browsing in likely locations (i.e., a library) for an information source (e.g., flyer, brochure, or librarian) and using the opportunity to ask a question. Non-directed monitoring is defined by a serendipitous encounter of information in an unlikely place. Individuals seeking information in this mode have no specific intent of locating information on a specific topic. Observing, overhearing information, or learning something through a conversation are ways the individual confronts information. The fourth mode is by proxy. By proxy refers to an individual who is referred to a source or identified as an information seeker. Savolainen's (2017) and McKenzie's (2003) everyday life information seeking model characterizes public library patrons and can provide insight into innovation implementation plans. The information needs, sources, and issues of public library patrons are varied, but identifying key communication channels of audiences will increase the likelihood of diffusion and adoption (Buchanan et al., 2018; Chatman, 1986). This tailored approach will help minimize concerns of information literacy and misinformation among the community (Buchanan et al., 2018). Many of these studies touch on elements of DOI theory but there is no study with a cohesive effort to combine all the recommendations.

Program Implementation

The progression of creating an innovative program or service to implementation will vary depending on the audience, the community social standards, funding, and timeline (Dali & Brochu, 2020; de Greef et al., 2020; Nguygen, 2020; Raynard, 2017). Often program implementation requires library staff to advocate to stakeholders the importance of programs or

innovations (de Greef et al., 2020). As the program needs to be advertised to the audience, de Greef et al. (2020) recommend a customer focus strategy that includes many kinds of communication services including word-of-mouth, social media, and other communities. Based on the case studies in de Greef et al.'s (2020) research five success factors for innovative programs were identified: adaptation to users, mixed-method communication strategies, interdisciplinary partnerships, iterative process, and potential user input.

Community engagement in the development and iterations of innovations is another step in intentional implementation of innovations (Moorefield-Lang, 2019). As the library and library staff serve the community, a collaborative approach to developing and implementing innovations not only provides value through ownership, but also extends the communication method via word-of-mouth. Library staff can consult with the community on what they want and need from their public library; the ownership in the creation of programs would likely drive the success of programs through repeat attendance (Casucci et al., 2016; Hoenke, 2021). Further, collaboration can also occur through other libraries or similar minded organizations to act as sounding boards such as homeless shelters, social service offices, and community schools and nursing homes (Hoenke, 2021; Nguygen, 2020).

Identifying the types of patrons who will likely use and benefit from programs and services is almost always cited as the first place to start (Dali & Brochu, 2020; Nguygen, 2020; Raynard, 2017). Dali and Brochu (2020) recommend using the lens of diversity and inclusion when making service-related choices. Identifying the demographic and psychographic characteristics of the patrons can increase acceptance, use, and attendance of services and programs (Raynard, 2017). Boekesteijn et al. (2017) differentiated various user groups to focus their efforts and services towards specific patrons. Echoing many others, Boekesteijn et al.

(2017) found that the involvement of stakeholders is crucial to the success of implementing any innovation. Understanding what appeals to patrons, what might entertain, empower, educate, stimulate, or build confidence in patrons will ultimately lead to a successful program (Nguygen, 2020). The components of DOI such as the norms of a social system and felt needs echo these suggestions.

Diffusion of Innovations

DOI can provide guidance for communication regarding an innovation, or new idea. The innovation does not need to be novel, but new to those who may be adopting it. According to Rogers (2003), diffusion is a special type of communication that revolves around a new idea. The diffusion process includes an innovation that is communicated over time, among members of a social system. The dimension of time in the diffusion process incorporates another process: the innovation-decision process. The innovation-decision process begins when a decision-making unit (e.g.., individual) learns about the innovation, forms an attitude toward the innovation, decides to adopt or reject it, actually implements and uses the innovation (adoption), and seeks reinforcement of their decision. For many individuals, the process is not a direct line, but a process through which opinions and decisions may change over time or with more knowledge. DOI theory includes five perceived attributes of innovations (relative advantage, compatibility, complexity, trialability, and observability) as well as four other variables that determine the rate of adoption including type of innovation-decision, communication channels, nature of the social system, and the extent of change agents' promotion efforts.

Diffusion can also be defined as social change, as new ideas are adopted or rejected by community members resulting in social change (Rogers, 2003). Rogers (1995) presented a bell-shaped curve to illustrate individuals who adopt innovations known as the adopter categories.

The first fifteen percent are innovators and early adopters, generally people who crave new things and are on the lookout to try something new. The remaining eighty five percent are broken into early majority, late majority and laggards as the mainstream market begins to adopt the innovation.

Prior to the contemporary forms of diffusion research, concepts such as personal influence, socioeconomic status, and the S-curve of diffusion were ideas by French sociologist, Gabriel Tarde (Rogers et al., 2019). Next, anthropologists began to investigate cultural and social changes in the 1920s, followed by rural sociology and agricultural applications in the middle of the century (Rogers, 2003). Eventually a former newspaper reporter noticed that news events via personal communication spread much more rapidly than agricultural innovations (Rogers et al., 2019). An early diffusion model was used in the STOP AIDS program that was founded and implemented by respected leaders in the community by targeting specific populations, low-cost measures, and small-group communication.

Rogers (2003) defined diffusion as “the process by which an innovation is communicated through certain channels over time among the members of a social system” (p. 5). Diffusion is a specific type of communication about a new idea and is also defined by Rogers (2003) as a kind of “social change” (p. 6) that includes a level of uncertainty due to the newness of the idea or innovation. Diffusion is what occurs to potential users, while adoption is a decision made by potential users. Both diffusion and adoption are processes, but they are separate. Diffusion can occur while adoption may not. Adoption is a change in behavior, meaning a user does something differently than they did before. For example, most teachers use email communication for professional purposes rather than interoffice memos. Email communication has been thoroughly adopted by those teachers.

Diffusion and adoption of new ideas, even ones that are recognized as positive can take years. For example, a study on hybrid corn seed in Iowa determined that it took over a decade for the hybrid corn seed to be adopted by most farmers, despite its heavy promotion, increased harvest, and drought-resistant qualities (Rogers, 2003). Rogers (2003) listed five variables that impact the rate of adoption of innovations: perceived attributes of innovations, type of innovation-decision process, communication channels, nature of the social system, and extent of change agents' promotion efforts. The perceived attributes of a specific innovation include relative advantage, compatibility, complexity, trialability, and observability.

Diffusion can often take a long time (Dearing & Singhal, 2020). However, past studies show by applying DOI theory to innovations in early dissemination and implementation phases, the diffusion and adoption of an innovation can be expedited (Dearing, 2009; Huang & Hsieh, 2012; Lin, 2011). Furthermore, studies showed that passive approaches to dissemination, or diffusion, are largely ineffective (Brownson et al., 2013; Doyle et al. 2014). An active approach that involves stakeholders is a much more effective way to diffuse an innovation.

DOI research is not a new social concept. Almost all diffusion studies are postdiction studies that use the DOI theory to explain the curve of adoption (Dearing & Singhal, 2020). More specifically, the characteristics of the adopters to predict who might adopt the innovation at what time are analyzed. Innovation attributes have been studied more recently, but still in a postdiction nature or an explanatory manner. Though many businesses, marketing professionals, and possibly even library staff may be affecting adoption of their innovation by catering to their audience's relative advantage, compatibility, complexity, trialability, and observability in accordance with DOI theory, there are few studies on the prediffusion development and application of innovation attributes during dissemination. There is a lack of literature on a

cohesive effort, driven by DOI theory, to design a diffusion plan for public library programming and services.

DOI in Libraries

The unique situation of public libraries presents the library staff with the potential to use their relational awareness of patrons' needs and focus on the patron to drive successful innovations (de Greef et al., 2020). With data from successful public health initiatives in libraries, public libraries can use past research to build diffusion plans specific to each innovation. Various types of libraries adopted innovations over the decades of their existence, from the now-nostalgic card catalog to online public access catalog to expanding material circulation to include nontraditional items. Although the literature documents innovations occurring in all types of libraries (e.g., academic, law, school, public, etc.), there are few studies on libraries utilizing DOI theory to communicate their innovation. The few DOI studies in the field of librarianship are set in academic libraries, in countries other than the United States, and analyze new technologies (Neo & Calvert, 2012; Raynard, 2017; Williams et al., 2019). There is also literature available when the library is used as the setting to diffuse public health initiatives which will be addressed in a later section.

There is a lack of literature that directly applies the DOI theory to studies in the field of librarianship, specifically public libraries in the United States. Although trade publications and articles in academic journals mention DOI, the literature gap is expanded when searching for discussions regarding the diffusion of library innovations within library staff or library patrons. Diffusion and implementation are possible in library settings, but are rarely, if ever, studied through the lens of sustainable plans developed with DOI theory. Diffusion studies in the library field often deal with technology and/or are in academic library settings. For example, in a paper

Musa et al. (2015) used DOI theory and the perceived attributes as a theoretical framework to discuss the non-use of digital library services. Musa et al. (2015) found that perceived attributes were a useful way to better understand an individual's adoption or non-adoption. Though this work is important, it does not address public library outreach.

DOI and Public Health

Public health adapts and changes with community needs and norms, just like public libraries. The healthcare sector, and in particular, public health initiatives, have recognized the value DOI theory has when working with the general public. In a germinal study, Goldman (1994) sought to determine if the perceived attributes of an innovation could be used in a nonprofit organizational setting. In a further analysis of perceived attributes predicting levels of program implementation, Goldman (1994) found that DOI should be useful in voluntary nonprofit health organizations and anticipated the transfer to health education settings as well. Doyle et al. (2014) performed a literature review of mobile devices in nursing education programs through the lens of DOI, focusing on the application of DOI phases to expedite adoption. Doyle et al. recommended applying DOI as a theoretical framework for mobile device implementation into nursing education.

The recognition of designing for dissemination purposes also seemed to have its roots within the realm of public health. Brownson et al. (2013) highlighted past research on public health intervention implementation noting that dissemination must be a calculated, active approach that targets a specific audience through multilevel approaches and stakeholder involvement. Though many factors remain difficult to change, such as infrastructure, other factors can be altered, such as involving stakeholders, to ultimately improve the effectiveness of the campaign. Brownson et al. (2013) found that only 17% of respondents in their study relied on

a framework or theory to guide the dissemination efforts of their campaigns, leaving a lot of room to improve.

DOI in Libraries and Healthcare

Though peer reviewed DOI studies impacting library programming are lacking within the field of librarianship, when the setting of the study is the library, many public health DOI studies can be cited. As a trusted institute with a platform that has a broad reach, the public library has been the site of the diffusion of many public health innovations (Bonnici & Ma, 2019; Cabello & Butler, 2017; Dixon, 2017; Malachowski, 2014; Morgan et al., 2016; Philbin et al., 2019; Vardell & Wang, 2020). That is to say that public libraries have been the bridge between the government or health services and library patrons (Bonnici & Ma, 2019; Dixon, 2017; Malachowski, 2014; Morgan et al., 2016).

Mass media and interpersonal communication are the two communication channels relevant to diffusion studies. Mass media channels provide a rapid awareness of an innovation while face-to-face exchanges can be more effective at persuading an individual to accept a new idea, particularly if the individuals share similar socioeconomic status, education, or other important categories (Rogers, 2003). Public libraries use their platform to communicate in various ways, such as printed materials, newspaper advertisements, word of mouth, and community partnerships (Bonnici & Ma, 2019; Costello & Keyser, 2016; Vardell & Wang, 2020). Public library staff can play the crucial roles of opinion leaders and interpret initiatives for patrons, but the library staff must be aware of the initiative and audience, as well as be involved in the creative promotion of the initiative (Bonnici & Ma, 2019; Costello & Keyser, 2016). Due to the trusted nature of public libraries, library staff can act as change agents and influence patrons by their consistent competence and reliable access (Rogers, 2003).

Public libraries have successfully disseminated information to the general public through various initiatives, though mostly public health related innovations (Bonnici & Ma, 2019; Dearing & Kreuter, 2010; de Greef et al., 2020; Dixon, 2017; Goytia et al., 2005; Malachowski, 2014; Morgan et al., 2016; Philbin et al., 2019; Vardell & Wang, 2020). Some of the studies successfully used the DOI theory to increase the rate of adoption (Bonnici & Ma, 2019; de Greef et al., 2020; Goytia et al., 2005; Malachowski, 2014; Vardell & Wang, 2020).

DOI in Similar Environments

Chatman (1986) emphasized products are not the only diffusible type of innovation. Chatman (1986) tested the DOI theory with an intangible innovation: job information in an environment of low-income, working individuals. Her application of the DOI theory required her to modify the definition of innovation which affected the diffusion through communication channels. Based on the demographics of the study, interpersonal communication channels were the primary source of information, which is in line with many other studies on diffusion (Bonnici & Ma, 2019; Katz & Lazarsfeld, 2017; Kreps, 2005; Malachowski, 2014; Morgan et al., 2016).

Brooks et al. (2014) interviewed potential users of a web-based catalog to analyze characteristics of an innovation that affect adoption through the DOI framework. Once again, including stakeholders, or intended audiences, was the crux for the study. They found that relative advantage, complexity, and compatibility are recommended focus areas when developing an innovation.

Dearing (2009) outlined diffusion concepts for the broad field of social science after years of working in various public health and communications projects that align with DOI. Dearing worked with Rogers, even writing a book on social issues and media (Dearing & Rogers, 1996). Much of Dearing's work is on public health interventions, but his top suggestion,

to focus on innovation attributes, has not been lost on others studying DOI (Dearing, 2009). Other recommendations include “clustering” logically related interventions to disseminate at the same time, demonstrations, similar organizations as partners, contextual conditions, and opinion leadership.

Designing for Diffusion

Everett Rogers (2003) wrote about the shift from studies on the potential adopters and their categories to the attributes of the innovations themselves. More recently, there has been a push for analyzing the dissemination of the innovation in a more controlled setting to fill the void in Diffusion of Innovations research and practice (Dearing & Singhal, 2020). Implementation and sustainability are factors that are often overlooked within typical diffusion studies. The extra steps taken in the beginning part of the diffusion process increases its chances of being noticed, positively perceived, and tried (Dearing & Kreuter, 2010). Marketing strategies such as push-pull can significantly increase the likelihood of diffusion (Dearing & Kreuter, 2010). The push activities revolve around the information being available and accessible. Pull factors include an understanding of potential adopters, choice of media, and sociological data about the social system (Dearing & Kreuter, 2010). Further, Dearing and Kreuter recommended designers to be listeners, include community partnerships, and base decisions on the sociological data about the social system.

It has been over a decade since Valier et al. (2008) extended the scope of DOI theory by providing empirical evidence that innovation attributes correlated with potential adoption, specifically during the prediffusion stage of an innovation. According to the study, relative advantage and compatibility were the most consistent factors that influence adoption. Valier and colelgues also identified communication techniques and social system behaviors as covariates in

the prediffusion stage. Various communication trends and technologies have improved in the past thirteen years, likely placing an even greater emphasis on communication techniques and social system behaviors as important factors for potential adopters.

Collaborative Design

Similar to the importance of knowing the target audience and the tactic of using likeminded organizations within the community to increase the likelihood of successful diffusion, collaborative design can pool expertise to design an innovation that best meets the needs of potential adopters as well as the change agency who creates the innovation. Hartzler (2015) found that collaborative design can be cost effective, fit into the setting's staff structure, and mission statement, and provide site specific data. This is similar to the component of the innovation-decision process's prior conditions (Rogers, 2003).

Audiences

Just as many specific factors were mentioned in this review, focused awareness on audiences is a method that is listed in many different studies of successful diffusion. The understanding of an audience when diffusing an innovation requires the designer to be aware and understand communication behaviors, system norms, and social networks (Rogers, 2003; Sundstrom, 2014). This is particularly important during the innovation-decision process. Rogers (2003) outlines the process in five stages that models how individuals or organizations learn about an innovation and adopt or reject it after implementation. Understanding the previous practice, whether the individual felt a need, their innovativeness, and the norms of the social system will provide change agencies information to potentially increase the rate of adoption (Rogers, 2003). Other characteristics for change agencies to keep in mind are the socioeconomic characteristics, personality variables, and communication behavior. Sundstrom (2014)

specifically suggested that race, class, and gender are missing components of this theory. Although innovation-decision making is done by an individual, there are similarities in demographically similar audiences for specific innovations.

Kreps (2005) describes efforts to disseminate health information to underserved and at-risk demographic groups. His review specifically addressed the ways libraries could develop communication strategies for audiences such as online access and education programs, and continue to cultivate relationships built on information exchanges.

Stimulators and Barriers

Though stimulators and barriers to adoption of innovation can vary within different demographic groups, timing, and setting of the innovation, recognizing that there will be stimulators and barriers regarding the likelihood of diffusion and adoption is important. Specifically, within the public library realm where innovations can be educational, cultural, leisurely, offer networking opportunities, or provide social support activities, Zbiejczuk Suchá et al. (2021) analyzed barriers and stimulators that could be present in structural, local, organizational, and personal levels. Structural barriers include the library's natural ability to withstand change while local stimulators include recognizing the needs of a community and working towards solutions. Not surprisingly, Zbiejczuk Suchá et al. (2021) also found that detailed knowledge of the community is necessary to be able to recognize needs and provide viable solutions.

Innovative Attributes

Rogers (2003) used the perceived attributes of an innovation to explain the rate of adoption of an innovation. He found that most of the variance in the rate of adoption of innovations can be explained by relative advantage, compatibility, complexity, trialability, and

observability (Rogers, 1995). Relative advantage is the extent to which an innovation is perceived as being better than a previous or current idea. Often relative advantage is measured through an economic lens, but social advantages and the like can also be motivating factors and increase the likelihood of adoption (Rogers, 2003). The measure of compatibility of an innovation is if it is perceived as consistent with past experiences, values, or needs of potential adopters. If an innovation seems familiar to sociocultural values and beliefs, previously introduced ideas or a specific need, it is more likely to be adopted. The naming and positioning of an innovation can be identified through a compatibility viewpoint. Whether or not an innovation is easy to understand, and use is the attribute of complexity. If an innovation is perceived to be clearly understood, it is more likely to be adopted. Trialability is the ability to experiment with the innovation and observability is the ability for an innovation to be observed being used. Rogers (2003) generalizes that trialability and observability are positively related to an innovation's rate of adoption, as perceived by members of a social system.

Marketing and social marketing strategies can drive the rate of adoption, such as the naming and positioning of an innovation (Rogers, 2003). Moore and Benbasat (1991) developed scale items to measure innovation attributes that can be applied to any innovation. Innovation attribute research provides data that help researchers predict the reactions of people which can help name, position, and relate the innovation to potential adopters (Rogers, 2003). There are other, less influential variables that determine the rate of adoption such as the type of innovation decision (optional, collective, authority); communication channels; nature of the social system; and promotional efforts of a change agent (Rogers, 2003).

Communication Channels. Mass media and interpersonal communication channels are two main sources of information (Rogers, 2003). Rogers noted that different communication

channels are required at different stages of the innovation-decision process. A communication model, the hypodermic needle model, posits that mass media has a direct and immediate effect on a large audience. Mass media can also create knowledge and spread information and change weak opinions. This type of communication is more important during the knowledge stage in the innovation-decision process. Interpersonal communication has more effect on strong opinions through two-way exchanges. This type of communication is more important at the persuasion stage.

Summary

Like much of diffusion and adoption research, there is a lack of perceived attribute studies within the field of librarianship. There are equally as few studies on communication channels through the lens of DOI theory in library related literature and no studies that highlight the efforts made by change agents in the library field, especially public libraries. Libraries are naturally situated to meet the unique needs of their patrons. Budget cuts and staff shortages often create environments to be innovative within specific parameters or to creatively reallocate resources. More specifically, public libraries have a positive track record of being innovative, but the diffusion of the ideas and programs has not been implemented as thoroughly as possible. Further, though some diffusion studies have highlighted the importance of potential adopter characteristics and potential barriers, there are no diffusion studies that target public libraries' innovations in a cohesive manner with a DOI framework.

CHAPTER III

METHODS

The innovation of public Wi-Fi in parking lots is beneficial for everyone but may have a greater impact on those who do not have reliable internet connections at home. Despite being widely beneficial, the challenge lies in informing patrons, chiefly individuals who have communication methods that are less common or information seeking behaviors, about the innovation and encouraging its use. Providing current public library staff with a deeper understanding of Diffusion of Innovations (DOI) theory was an immediate outcome that led to different ways to consider patrons' needs while developing a diffusion plan for parking lot Wi-Fi hotspots. Applying elements of DOI theory to a diffusion and outreach plan for public use Wi-Fi guided public library staff in a more direct and effective effort.

Context of the Study

In order to gather an in-depth understanding of how a specific public library used DOI theory to enhance promotional efforts, I served as a diffusion expert as well as a qualified librarian to assist the library staff in creating a diffusion plan for a specific innovation: parking lot Wi-Fi hotspots. Parking lot Wi-Fi hotspots were already developed and available to the public, with little use in their service area. The Wi-Fi hotspots were originally developed in response to the initial wave of the COVID-19 pandemic and the consequential shutdowns that occurred. The library used grant money to purchase Wi-Fi hotspots and distributed them to local churches throughout the community. Many churches were happy to assist and plug in the hotspot inside their building and grant permission for a sign to be placed in their parking lot. The churches were also willing to allow community members to be in their parking lots at any time.

Though the initial response to the community's need for free internet access at many locations was valiant, it quickly became clear that the innovation was not communicated clearly to those who might need it the most. The study served to provide data on how public library staff used DOI theory elements and information-seeking behavior frameworks when promoting services. Results included what components of the theory are most applicable to public library staff to provide a strengthened promotion and outreach plan for this innovation.

As there is little to no research with this specific angle of the DOI theory, an exploratory case study was employed (Yin, 2018). The qualitative nature of a single case study allowed for an in-depth analysis of how public library staff worked with a DOI expert in crafting a diffusion plan for parking lot Wi-Fi hotspots. As many public libraries, and perhaps any type of library, may not have the resources to work with a DOI expert, the results and developed diffusion plan can serve as a template for those looking to implement this without an expert.

Design

Qualitative research questions seek to answer how or why, so that the researcher can gain an in-depth understanding of what is going on relative to the topic (Patton, 2015). For the current study, I explored public library staff's ability to apply DOI theory to programming and services with the following questions:

RQ 1: How did public library staff develop a diffusion plan to implement parking lot Wi-Fi hotspots using DOI theory?

RQ 2: How did public library staff address stimulators when developing a diffusion plan to implement parking lot Wi-Fi hotspots using DOI theory?

RQ 3: How did public library staff address barriers when developing a diffusion plan to implement parking lot Wi-Fi hotspots using DOI theory?

RQ 4: Which DOI innovation attributes did public library staff find most applicable to diffusing parking lot Wi-Fi hotspots and why?

In addition, a qualitative approach allowed me to explore phenomena, such as feelings or thought processes, that are difficult to extract or learn about through quantitative research methods (Corbin & Strauss, 2015). Because the nature of this study was to learn about the process public library staff took to develop a diffusion plan and implement it, quantitative results would not be as meaningful for replicated studies. For the present study, I examined library staff's perceptions and work experiences when developing a diffusion plan with DOI theory elements.

Finally, qualitative methods emphasize my role as a participant in the study (Yin, 2018). For the present study, I was a key instrument in the development of the diffusion plan, data collection, and the interpreter of data findings (Stake, 1995). Relationships were established between me and the library staff in order to gain access to information to answer the research questions (Maxwell, 2013).

Case Study Design

A qualitative case study approach assisted in connecting the exploratory nature of the how or why research questions. Further, case study design provided an opportunity to focus on a case and "retain a holistic and real-world perspective" (Yin, 2018, p. 5). The distinct features of case study, such as relying on multiple sources of evidence and using previous development of theoretical propositions to guide data collection and analysis, can strengthen theoretical concepts or reveal new concepts. As I addressed the application of the DOI theory to public library programming outreach in a manner that the literature has not yet presented, case study design

suited the research as boundaries between the phenomenon and context included numerous variables.

This study employed an exploratory case study methodology using a holistic design (Yin, 2018). Current literature does not contain examples of the application of DOI theory in public library outreach. Additionally, exploratory studies explore presumed causal links that are too complex for surveys or experiments; an exploratory case study is the most appropriate method of data collection and analysis (Yin, 2018). Additionally, the case of public library outreach and programming not reaching the full potential of users is a common case (Beaunoyer el al., 2020; Boekesteijn et al. 2017; Public Library Association, 2020), making the study an optimal candidate for exploratory case study research.

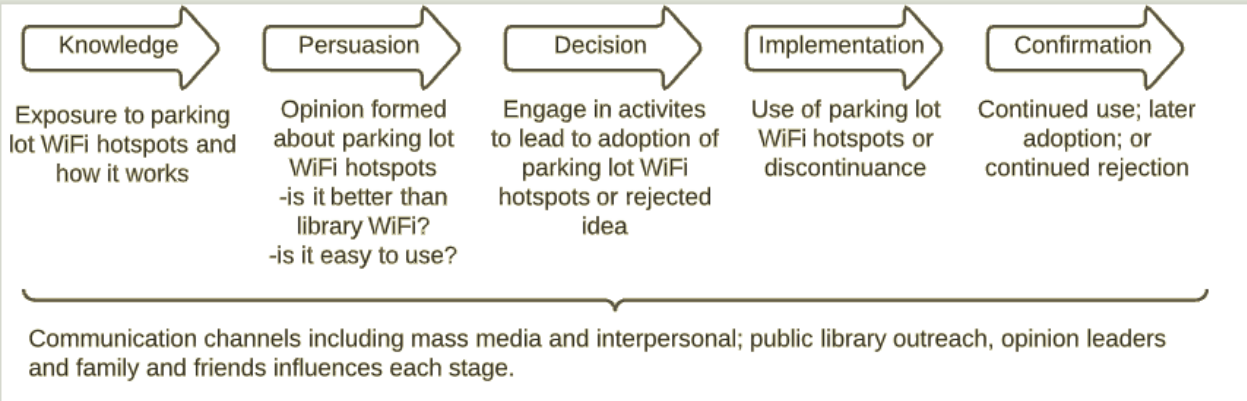
A single case study was employed as this research's design. A single case was rationalized in this study because I was able to capture circumstances and conditions of an everyday situation and provide data on the processes related to some theoretical interest (Yin, 2018). I sought to explain how public library staff can apply DOI theory to their outreach and promotional efforts. Case study is employed when researchers seek to explain a contemporary circumstance. Further, the study required no control over behavioral events and had a focus on contemporary events making case study the appropriate method. The specificity of the study included extending DOI theory into public library practice as well as a focus on the predictive validity DOI theory offers. By using a case study methodology to explore an under-researched topic, the decisions, implementation process, and end results were highlighted through participant-observation. I used qualitative data to achieve this aim. The primary data were collected by me as the most suitable approach for answering the research questions.

Framework Applied

DOI theory served as the theoretical framework for this study. The theory includes attributes of innovations and the impact they may have on the rate of adoption. Research on innovation attributes can be a valuable predictor of potential adopters (Rogers, 2003). The perceived attributes of innovations include relative advantage, compatibility, complexity, trialability, and observability. Research exists on measuring the attributes of innovations, but studies that directly work to implement innovation attributes during development did not. The value of local expertise and culturally appropriate solutions to community problems were acknowledged by diffusion experts (Rogers, et al., 2019). For the specific innovation of parking lot Wi-Fi hotspots, patrons will likely go through the process outlined in Figure 2.

Figure 2

Public Library Patron's Innovation Decision Process



Note. Adapted from Rogers (2003) innovation-decision process and applied to parking lot Wi-Fi hotspots.

Mission and Goal

The goal of the study was to gain an in-depth understanding of how public library staff apply DOI theory elements such as innovation attributes and communication channels to create a diffusion plan as part of library outreach and promotional efforts. The final stages of the study

discussed the implementation of the diffusion plan. The study provided data to help me gain an understanding of the usability of DOI in public library outreach and promotional efforts as potential stimulators and barriers when disseminating information about public library outreach and programs' innovations.

Researcher's Identity Memo

My work as a librarian predates my work as a researcher. I began my librarianship in the public library while completing my graduate studies in library science. I broadened my exposure to the library world by taking on the role of a school librarian and also becoming involved in professional development opportunities, professional organizations, and associations related to librarianship. It has always been clear to me that libraries can be, and often are, the foundation that helps society progress. Libraries exist to provide education and entertainment, information and resources, references and programs to enhance their communities and those in it for free. Despite years of flat budgets or decreased funding, libraries have been innovative and continue to find unique ways to serve their patrons. As a librarian, a library patron, and active community member, I would often share the wonderful programs and initiatives that libraries offer to the (pleasant) surprise of community members who are usually more typically in the know. It seemed like libraries' communication efforts about their innovations weren't always reaching their full potential.

While working through my PhD coursework in instructional design, I recognized that although Roger's DOI theory is often applied to the use of technological devices, it is a communication theory at its core. Effective communication about innovations was what libraries were missing. My experiential knowledge of both DOI theory and librarianship led to this research (Maxwell, 2013).

Methods

Preparing to collect case study evidence is one of Yin's (2018) crucial steps in case study research. Researchers need to have the ability to ask good questions, be a good listener, stay adaptive, have a firm grasp of the topic being studied, and conduct research ethically, as well as understand the goals and implications of the research (Maxwell, 2013). Yin (2018) further suggested creating a formal case study protocol to follow through the data collection and analysis process, allowing the researcher to be the instrument (Maxwell, 2013). Yin's (2018) protocol has four sections: overview, data collection procedures, protocol questions and tentative outline for case study report. All elements fit into this section in seamless ways except the protocol questions.

Protocol Questions

Yin (2018) recommends crafting questions that direct the focus of data collection via case study protocol. The protocol questions are questions that the researcher must keep in mind during all data collection and potential sources of evidence. These questions reflect the researcher's line of inquiry. Yin (2018) refers to the protocol questions as the case study instrument. These questions are not posed to any participant, only the researcher as a driving focus during data collection. The list of questions may grow during the study or include different levels of questions that may focus on specific interviews, patterns, or normative questions about recommendations, conclusions beyond the scope of the study (Yin, 2018). The protocol questions are aligned with and informed the study's research questions.

1. What is the public library doing to promote current innovations?
2. What is the public library doing to educate patrons about current innovations?

3. Does the promotion or marketing technique ever change based on the innovation (audience, funding, etc.)? If so, how does it change?
4. Is there an overall feeling of not reaching the potential number of patrons? When and why does this occur?
5. Does the public library staff have a sense of openness to try an intervention to possibly reach more patrons? What does that look like?
6. What does the public library staff see as benefits of adopting the Diffusion of Innovations theory to outreach communication plans?
7. What does the public library staff see as detriments of adopting the Diffusion of Innovations theory to outreach communication plans?

Case Selection

The case was selected through convenience sampling due to approved access and geographical location as related to me as the researcher. The case was also selected because of the amount of innovative outreach programs the library provides its patrons regularly, which is critical for the researcher to best understand the phenomenon as well as the availability of a current innovation that was perceived as not reaching patrons (Stake, 1995; Yin, 2018).

Participant Selection

The participants included library staff of varying levels. Although public libraries must employ some master-degree level librarians based on the community's total population, not all library staff have degrees or formal training in librarianship. The participants were selected to fulfill executive perspectives, outreach library staff perspectives, and general library staff perspectives. All selected participants were familiar with library functions and have worked in the field for at least one year. One executive library employee, four managerial librarians, one

outreach director, and two general library staff employees were selected for this study. The director encouraged all employees to participate during working hours. The executive library employee role was filled by the executive director. The executive positions are responsible for all phases of library operations and work full time. Outreach director positions focus on traditionally underserved communities and work to develop programs and policies to make the library accessible to all. Outreach directors work full time. Manager librarian positions supervise a specific department of library work such as programming or circulation. Manger librarians work full time. General library staff are often working the circulation desk and serve library patrons by checking books in and out. Most general library staff positions are part time. Table 1 outlines the participant roles and their pseudonyms.

Table 1

Participant Overview

Participant Pseudonym	Role at Library	Years of Experience	Formal Library Training	Fulltime/Part time
LeAnne	Executive Director	21	MLIS	Fulltime
Halee	Public Program & Outreach Manager	18	MSLS	Fulltime
Alice	Acquisitions Manager	10	MLIS	Fulltime
Linda	IT and YA Programs Manager	15	N/A	Fulltime
Tori	Youth Program Assistant	2	N/A	Part time
Mya	Children's Librarian	5	N/A	Fulltime
Kayla	Development & Community Services Manager	2	N/A	Fulltime
Eliana	Community Relations/Development Coordinator	1	N/A	Fulltime

The public library selected served approximately 35,000 people in South Central Pennsylvania. The current library building was built in 1995, and has large windows, inviting gardens, and even a skate park on the borough owned property. The facilities include children's story rooms, comfortable seating, new technology (i.e., touch tables, new computers, laptops and scanners), meeting rooms and kitchens for public use as well as a passport office, post office, and a hub of organizations to streamline social services. Though the public library acts as its own individual library with its own board of directors, it is part of a larger county-wide public library system.

Confidentiality

Throughout the duration of the research, the confidentiality of the participants was protected. The documents were stored in a password protected case study database as portable document formats (Yin, 2018). The interviews were recorded and transcribed. Pseudonyms were used for the staff names throughout the coding process. Data will be kept for one calendar year after publication then responsibly deleted. The recordings, transcriptions (after member checking), and researcher notes were also stored in the case study database. All unnecessary identifiers were removed from the files.

Data Collection

The collected data for this study included relevant documentation, interviews, field observations, and focus groups. To strengthen the single case study approach and eliminate bias, multiple sources of evidence were collected to triangulate the results (Yin, 2018). Yin presented four principles of data collection: use multiple sources of evidence, create a case study database, maintain a chain of evidence, and exercise care when using data from social media sources. The first three principles were followed in this study as there were no data collected from social media sources. Relevant documents were collected as part of the study to bolster the qualitative nature of the study (Stake, 1995; Yin 2018). An individual interview with the executive director was conducted once at the beginning of the study and individual interviews with other library staff were conducted twice throughout the phases to gain personal and focused information. Each interview was recorded and transcribed. Observations and facilitation of the development process was documented by me during the design phase of the study. I worked with the public library staff to create a diffusion plan that included knowledge about prior conditions, characteristics of the social system, and an understanding of the perceived characteristics and communication

channels of the innovation after the interviews (Brooks et al., 2014; Nikolopoulos et al., 2012; Yin, 2018). Field notes were taken during each observation. Finally, focus groups were held to deliberately surface the views of all library staff and analyze results from previously analyzed data (Yin, 2018). Reflective notes were taken following each observation and focus group. Table 2 outlines the data collection plan.

Table 2

Data Collection Plan

Type of Evidence	Source of evidence	Details
Documentation	Outreach efforts; advertisements	RQ 1; RQ 2; RQ 3
Development Process	Field notes	RQ 1; RQ 2; RQ 3
Interviews	Library staff	RQ 1; RQ 2; RQ 3; RQ 4
Participant-Observation	Library staff	RQ 1; RQ 2; RQ 3
Focus Groups	Library staff	RQ 1; RQ 2; RQ 3; RQ 4

At the conclusion of the study, I continued to work with the public library to assist with implementation of the plan. Though the purpose of this study was to provide an understanding of applying DOI elements into public library outreach development and planning, the work done in this study will be implemented and used in the participating public library. The implementation and potential adoption were not part of this study, but future research can be done on the patron adoption levels based on this shift in outreach practice and promotional efforts. As of the completion of this dissertation, the public library plans to implement the developed diffusion plan beginning with the start of back-to-school season at the end of summer 2022.

Participant Information Session. Prior to the development of a diffusion plan, the library staff needed to be informed about DOI theory and diffusion elements that they aligned with their outreach and promotional efforts. During a staff meeting, I presented a ten-minute

slideshow on the fundamental components of DOI theory that I created. Particular attention was paid to the diffusion process and innovation attributes. I also provided handouts of the slides as well as a one-page quick reference on DOI (see Appendix A). An example of how DOI theory can be applied to public library outreach was included in the presentation. The informative session ended with an explanation of the imminent study. All questions and concerns were addressed before concluding. A focus group occurred two weeks after the information session and one week before development to ensure participant comprehension and serve as an additional source of data.

Documentation. Documents are relevant to every case study topic (Yin, 2018). Relevant documents included meeting notes, outreach efforts, and advertisements regarding parking lot Wi-Fi lot hotspots. The documents served to corroborate and augment information from other sources. The documents were selected by summer and fall promotional materials available in print and online. Any meeting notes about Wi-Fi parking lot hotspots from January 1, 2020, through present day were requested, but participants did not have any notes. Participants were aware of the documentation collection. The documentation collection included: advertisements for the public parking lot Wi-Fi (see Appendix B), commentary from a pastor who implemented the program, summer program catalog, and an annual report.

Interviews. Three interview rounds took place during this study. The first interviews were focused while the second and third rounds were open-ended. The first interview took place with an executive library staff member to assess current marketing efforts, discuss DOI theory and plan an informative DOI session with library staff as well as gain an understanding of what the library is currently doing as far as promotional efforts for various programs. The second and third rounds of interviews were with seven library staff during the development phase. The

aforementioned case study protocol questions above guided my line of inquiry, but other conversational questions were also used to reflect the current situation. The project's process drove the questions during the interviews in rounds two and three. The interviews did not take more than 40 minutes at a time; however, the interviews took place over multiple sittings, in prolonged interview style.

Participant-Observation. The participant-observation technique allowed me to take part in the study by assisting with the development of a diffusion plan to enhance outreach for parking lot Wi-Fi hotspots. The participant-observation model allowed for evidence to be collected that would otherwise be inaccessible or forgotten (Yin, 2018). Further, the participatory nature fostered the generation of useful information that was helpful to both me as the researcher and the participants through development (Maxwell, 2013). Additionally, I have library qualifications which allowed me to truly perceive the reality from the "inside" while working with the library staff, instead of an external observer. The participant-observation technique also allowed for manipulation of minor events such as meetings and work time as schedules and staff are often stretched thin at public libraries. I sought to remove as many potential barriers to the study as possible. The challenges associated with participant-observation (i.e., bias, assuming roles contrary to good social science, too much attention as participant) certainly exist and were accounted for during all data collection. All procedures were thoroughly documented to minimize errors and bias by using a case study protocol and a case study database. I was also explicit while conducting all research to ensure the possibility of study replication in the future.

As a participant, I used clarifying questions to ensure comprehension during interviews and focus groups.

Maxwell (2013) noted that the researcher needs to be aware of all relationships with participants, whether established prior to the study or during, and the influence that may have on the data collection. I had experience working in the public library with many of the staff who were part of the study. This study required a different relationship with the participants, as a peer and researcher, to understand the process and perspective of developing a diffusion plan for the public Wi-Fi initiative. As this does present the potential risk of bias and distortion of data (Maxwell, 2013), I believed I established a climate where the staff was not afraid to be authentic through ensuring the data were kept confidential and not used outside the study.

Prior to participant-observations, I reviewed objectives for data collection via the research questions and the case study protocol questions. During all collaborative participant-observations, I took field notes to include library staff present, work that was completed, who the work was completed by, any interactions between library staff (verbal or otherwise), as well as content tied to the DOI components of focus (DeWalt & DeWalt, 2011). Further, I paid attention to the general categories recommended by Guest et al. (2013): appearance, verbal behavior and interactions, physical behavior and gestures, personal space, and people who stand out. I maintained an awareness to the process and flow of the work time (Guest et al, 2013). The benefit of this type of evidence far outweighed any challenges for this study. The field notes drove the interview and focus group questions as they iterated (see Appendices D and E).

I assumed the role of team member in the fieldwork situation to actively participate in the development of the diffusion plan. I provided outlines for each meeting to maintain a sufficient pace of the development of the diffusion process. I provided context and served as subject matter

expert on the diffusion process as questions or concerns arose. As a participant-observer, I was also taking notes and raising questions throughout each meeting.

Focus Groups. The focus groups procedure is similar to single interviews but with a convening of a small group of people (Yin, 2018). The discussion was moderated by the subject matter expert (myself) to draw out the views of each person. In the case of the focus group meeting with library staff in the preparation phase, I was focused on the library staff's comprehension of DOI theory as it relates to outreach after the information session. The final focus group corroborated earlier findings and provided fresh commentary on the topic (see Appendix F). The data collection timeline in Table 3 outlines the phases the research followed. The study advanced as the data became saturated in each phase.

Table 3

Data Collection Timeline

Phase	Data Collection	Instruments	Data Analysis
Preparation Phase Weeks 1-2	Engage with library administration	Structured interviews	
	Present DOI information to library staff	Observational field notes	Preliminary coding of interview and field note data
	Meet with library staff about DOI	Focus groups	
Design Phase Weeks 3-8	Weekly meetings to develop diffusion plan	Observational field notes	Weekly ongoing pattern matching from all data sources
	Meet with library staff at the end of week 5 and week 8	Unstructured interviews	Identification of emerging themes
Implementation Phase Weeks 9-10	Meet with library staff and admin	Focus group	Logic model analysis

Analysis

Similar to case study data collection, there is no fixed formula to follow for analysis (Yin, 2018). I used empirical thinking and the presentation of evidence to consider all interpretations. I used an inductive strategy for analysis. Key concepts emerged from the closely examined data. Various analytic techniques were used in this study, including thematic coding and logic modeling. Thematic coding has three steps to create a categorical matrix (Maxwell, 2013). The data were coded through open, axial, and selective coding processes. The open coding occurred throughout each phase and drew attention to themes as they began to emerge. The axial coding aligned the open codes to the research questions. Lastly, the selective coding process provided the overarching category that provided answers to the research questions (Saldaña, 2016).

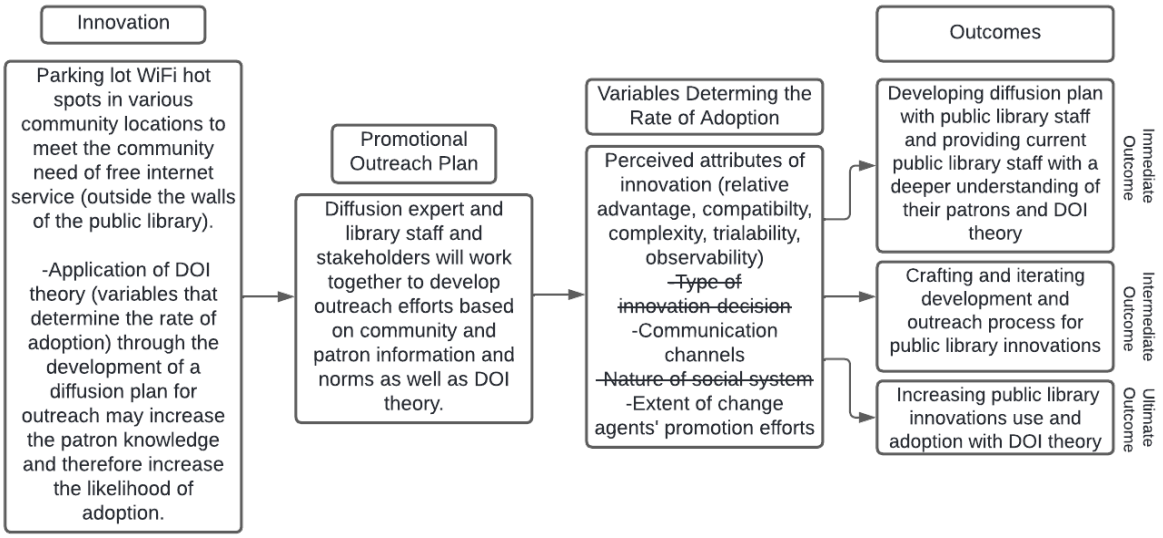
In addition to categorical coding, a logic model was developed to illustrate how a complex activity takes place over time (Yin, 2018). Public library staff applied Rogers' theory to outreach efforts with the ultimate aim at increasing the likelihood of parking lot Wi-Fi hotspots' adoption by patrons. The focus of this particular study was to analyze how DOI theory can be applied to outreach and promotional efforts for parking lot Wi-Fi hotspots. Developing the diffusion plan with public library staff and providing current public library staff with a deeper understanding of DOI theory and their patrons were immediate outcomes. Crafting and iterating a development and outreach process for public library innovations was the intermediate outcome, which was outside the scope of this single case study. The ultimate outcome will be increased parking lot Wi-Fi hotspots use and adoption, but as adoption can take years to occur (Rogers, 2003; Yin, 2018).

An individual-level logic model focuses on the stipulated sequences of boxes in Figure 3. The logic model does not include two of Rogers' (2003) five variables to determine the rate of

adoption because they are predetermined. The type of innovation decision for parking lot Wi-Fi hotspots is an optional innovation-decision. Individuals can elect to adopt or reject the innovation independent of other members of the social system (Rogers, 2003). The individual has complete responsibility for their decision which can lead to a slower adoption rate. In addition, the nature of the social system included the entire community that the public library serves. While behaviors and beliefs vary within the individuals in the community, the library does not control individuals. First round interviews with executive library staff and document collection provided data on the social system (see Appendix C). Further, all outcomes were listed, but only the immediate outcomes were produced by this study's activities (Yin, 2018). Finally, an expanded logic model was crafted to provide a visual representation of how the complex activity took place over time.

Figure 3

Anticipated Logic Model for Public Library Outreach with DOI



Trustworthiness

According to Yin (2018), trustworthiness is enhanced by triangulating data and maintaining a chain of evidence. Yin (2018) further suggests using multiple sources of data to help capture a broad range of perspectives, behaviors, and attitudes. As case study research is a method within empirical social research, the logical tests for validity are relevant for case studies. Though qualitative research does not usually deal with validity and reliability, but usually speaks to trustworthiness, Judd et al. (1991), Gibbert et al. (2008), and Yin (2018) suggest using this criterion to judge the quality of case study design. For this study, four tests of validity were used. Construct validity was ensured by using multiple sources of evidence, establishing chains of evidence, and using experts to review the protocol, and transcriptions were validated by participants. Internal validity was ensured by utilizing a logic model (Figure 3). Yin (2018) sited logic models and their outcomes as a technique to limit the threat of internal validity as the researcher makes inferences during the analysis process. The logic model helps the researcher pay particular attention to convergent evidence and rival possibilities. External validity was ensured by using the DOI theory. Reliability was ensured by using the case study protocol, case study database, and maintaining chains of evidence. The case study database housed all data and data analysis, organized by phases (Table 2). The database was managed by manual data inspection, utilization of a codebook for data coding to help eliminate errors due to omissions or wrong data entry, weekly screens of data to detect missing data and errors of data entry, and duplicate copies in physical and digital formats; and all data were stored in secure locations and devices. I used the codebook to define and label each of the variables and assign codes to each of the possible responses. Member checking validated the data prior to analysis. A qualitative expert and member of this dissertation committee co-coded 10% of the data and

verified and negotiated codes that resulted from their analysis for further trustworthiness. The coded data were negotiated, and further validation was not necessary. The expert and I had similar results for the coded data and negotiated on the differences through conversation.

Study Limitations

The unit of analysis for this case study was the development of a diffusion plan for one innovation within the focus of one public library. I, as the researcher, assumed integrity and honesty, and commitment to the public library's mission from all participants. I have worked in a professional capacity within the public library system. The design of the study focused on one public library in South Central Pennsylvania and focused on one outreach innovation: parking lot Wi-Fi hotspots. The evidence was limited to the staff of the public library.

In addition, I played the role of a subject matter expert in assisting the library staff in the development of a diffusion plan. This specific type of data collection is called participant-observation. This role within the fieldwork situation provides opportunities for collecting unique data but does come with challenges. The study was limited by an internal view, instead of an external one. Other challenges included the participant role requiring too much attention relative to the role of the observer which would limit time to take sufficient notes or raise questions but was mitigated through focused agendas and maintaining a comfortable environment for facilitating conversation (Yin, 2018). Adoption was out of the scope of this study as adoption can occur over long periods of time (Rogers, 2003). The findings will be presented for chapter four, aligned to the four research questions.

CHAPTER IV

FINDINGS

In this chapter, I present the findings of a participant-observation case study (Yin, 2018) through the lens of Diffusion of Innovations (DOI) theory in a public library setting. Public library staff applied DOI components to the innovation of public Wi-Fi in community parking lots through extended, focused meetings to ultimately create a diffusion plan aligned with DOI theory elements. Data about prior conditions and characteristics of the social system was collected at phase one. Foundational information regarding normal communication operations for library innovations and initial informational sessions on DOI theory helped shape the participant-observation phase where I worked with library staff to home in on realistic ways to apply components of the theory. During phase two, I, as the DOI expert and facilitator, guided the group by breaking up components of DOI theory and discussing them in smaller chunks. There was a total of four focused group meetings that targeted elements of DOI theory: (a) communication channels and library promotional efforts, (b) relative advantage, (c) compatibility and complexity, (d) trialability and observability. There were also individual interviews to corroborate what I observed during the design phase. A diffusion plan was crafted, and the public library plans to implement the diffusion plan at the end of their summer reading program. The goal of the study was to determine the likelihood of public library staff applying DOI theory to outreach and promotional efforts successfully, including barriers, stimulators, and attributes of the theory that are most applicable to public library outreach.

The goal of this study was to analyze the process through which public library staff implement DOI theory elements into outreach programming and services via promotional efforts and marketing. As a community member and active librarian, I was well aware of initiatives that

this public library, as well as many others across the country, were putting together for their patrons. Though the most recent innovative initiatives were a response to patron needs during the COVID-19 pandemic, libraries have been responding to patron needs in unique ways for decades. With the frequency that public library budgets are cut, instead of matching inflated costs of books, databases and utilities compounded by staff shortages, it is not difficult to imagine that the marketing and diffusion efforts could be improved. Prior to the study, I confirmed my initial beliefs that, in general, public library programming does not reach all intended audiences through anecdotal conversations and explicitly through discussions with the executive director of the Pennsylvania Library Association. The limited resources (staff and funding) leave public libraries unable to do much about the issue. My work in the Instructional Design and Technology (IDT) field and subject matter expert in DOI theory led me to the idea of implementing DOI components in public library outreach efforts.

The purpose of the study was not to discover whether or not public library outreach followed DOI theory, because it was assumed that they do not or do not with any intention. The study was also not designed to be a measure of adoption as is typical of DOI studies. Instead, I sought to gather more information on the possibility of public library staff implementing DOI characteristics via a diffusion plan for a library initiative. A result of the study, that was expected but not the central focus, was the diffusion template the library staff crafted through their focused sessions with me as a participant-observer (see Appendix G). The template can be used in future research or by other libraries curious about this initiative but without access to an expert in DOI theory.

One public library branch was studied to determine the likelihood of implementing components of DOI theory to public library outreach. At the conclusion of this study the library

staff had generated a list of tasks assigned to specific staff members to begin implementing specific components of DOI theory into their outreach for Wi-Fi in shared community locations (see Appendix H). Though this innovation was already in existence and use, the entire staff, including the executive director, recognized that the initial unveiling of community Wi-Fi was hastily thrown together during a pandemic related shutdown to try to quickly provide internet to the community. Now that there is more time (and less pressure) to re-release this innovation and service, the library wants to make sure they reach as many people as possible. The focus for this study was on an innovation that was already designed and in use: public Wi-Fi in community parking lots. There were three phases in this study: (1) preparation, (2) design, and (3) implementation. The study took place over ten weeks with eight participants with the addition of me as the participant-observer. This chapter outlines the findings for each thematic code. The findings are presented according to the four research questions that this study addressed:

Research Questions

1. How did public library staff develop a diffusion plan to implement parking lot Wi-Fi hotspots using DOI theory?
2. How did public library staff address stimulators when developing a diffusion plan to implement parking lot Wi-Fi hotspots using DOI theory?
3. How did public library staff address barriers when developing a diffusion plan to implement parking lot Wi-Fi hotspots using DOI theory?
4. Which DOI innovation attributes did public library staff find most applicable to diffusing parking lot Wi-Fi hotspots and why?

Data Analysis

Upon completion of all three phases, determined by the completion of a diffusion plan for public Wi-Fi sponsored by the public library, I analyzed the data. There were multiple types of data collected throughout the study to increase the trustworthiness. The documents that were collected in phase one (program flyers, commentary from host site liaison, original advertisement for public Wi-Fi, and interview with executive director) were thematically coded using an inductive strategy (Saldaña, 2016). After the initial thematic codes were identified through the raw data, a secondary analysis was completed by using axial coding. The codes were matched to the research questions they seemed to provided answers to.

When working with library staff on DOI theory, they first needed a clear but concise and foundational understanding of the theory. This was necessary so staff could make connections to how they already performed outreach and promotional efforts. It also allowed time for the participants to thoughtfully consider the topic and definition before a group discussion.

The findings of this qualitative study are presented via themes that appeared throughout data collection. The data were analyzed and triangulated. The results are presented by their alignment to each research question. Not all themes aligned to one research question, but instead to two or three. The interrelationships of results that can answer multiple research questions will be addressed.

Research Question One

The first research question broadly addressed the procedural events that need to occur for public library staff to develop a diffusion plan for an innovation. Phases two and three, the design and implementation phases, were observed and examined. Themes and patterns were captured through focus groups and individual interviews. This question was a broad, overarching

question that drove the purpose of this study: to analyze the library staff and researcher perceptions of the design process (as well as the preparation and implementation).

Group Work and the Importance of People. The theme of group work and importance of selective people and personalities was perceived as vital to the success of any type of new initiative, framework, or workflow by the library staff. This theme was defined as staff working as a unified yet unique team. I noted that personalities were valued above positions and titles and that the environment had to be safe and inclusive.

The team tasked with developing the diffusion plan for public Wi-Fi in community spaces was made up of various library staff members. The team had members of the programming team which included participants with the titles of children's librarian, manager of public and outreach programs, teen programs manager and IT specialist, youth program assistant, and manager of development and community services. Additionally, the team also had two participants not from the programming team: community relations and development coordinator and acquisitions manager. The diversity of titles also means a variance in degrees and certifications. The library staff were also varied by life experience, previous positions, and personality. Four of the seven library staff highly valued the importance of having a "safe place where no one feels like they're stupid" and a team that is comfortable and openminded, "we're also comfortable with each other, we don't care what we say and even if we sound like an idiot, we're going to say it anyway." The field notes and reflection from my participant-observer role did point out that "participants weren't eager to jump into academic conversation but could use DOI elements in application during discussion." The first session did include a lot of talk from me to set the expectations and environment. Once the library staff opened up, I noted that:

The library staff were eager to talk about innovations, how to reach patrons, and

partnerships that already existed. Some staff members have worked at this library for over a decade while some had just started working there within the past few weeks. There was an easy, comfortable air in the room and everyone was comfortable chiming in on what they knew about this community, the library, and what might or might not work.

The pandemic offered new ways to find collaborative time, but personalities played a role in how successful different strategies were. Mya excitedly shared that:

> I feel like we can be ridiculous at the team meetings, but I feel like so much is developed during them. We never had team meetings before and they only started during the pandemic. They started with Tom and that wasn't very helpful because he just wasn't the right person for this job. But when they started with Halee, they were much more informative and I've learned a lot more from the group as a whole, being able to meet like that. So, yeah this kind of meeting together is definitely more helpful than anything else that I've done.

Another participant's thoughts added to the importance of open and willing personalities in library staff roles. Many library staff seemed to echo the idea that the right person in the right job allows them to utilize their strengths. Alice, the acquisitions manager, reflected:

> We work in different areas, but also we have very different approaches to how we do our work, you know? For me, I am very detail oriented; I want to get every last detail correct. Whereas other people are big picture, and you know, and the nitty gritty they leave to other people because they are good at seeing those big overview things, but at the same time aren't as good at the little things. That's why acquisitions is great for me because I am into the nitty gritty and big stuff sometimes gets overwhelming.

While dealing with a new, academic way of crafting an outreach plan, the more comfortable the library staff were with other participants and the topic the more worthwhile the conversation. The library staff also recognized the importance of crafting groups with people who have different roles and different personalities. Alice acknowledged, “I don’t think it’s necessarily the position, it has to do with the personality of the person who’s in that position.” Implementing a new way to promote and plan seems to be more likely to succeed with open minded people in a variety of roles and personalities as summarized further by Alice, “it’s the people who are the ones that make the difference.” Kayla, the social services coordinator, extended that thought by stating that “truly putting all of our heads together has helped, all of us see many more angles that we never even thought of before, of all of us. So, I love doing it.”

The code of *group work* and the *importance of people* could have likely been broken into two separate codes, but they appeared together so frequently, especially during individual interviews. Though not every participant made a direct comment on the importance of groupwork, no participant was contrary to working in a unique group. It may seem trite to explicitly state that the success of any type of implementation hinges on the people involved and personalities, but it was clearly important to the library staff. This group was successful at developing a well-rounded and DOI aligned diffusion plan because they came to each topic with different work experiences and understandings but felt safe enough to express ideas and questions that immediately came to their minds.

Extended, Focused Time. During phase two of data collection, the library staff worked with me as a participant to develop a diffusion plan for public Wi-Fi in community spaces. Phase two consisted of four focus groups. Each meeting concentrated on one or two factors that influence adoption through the lens of the innovation of public Wi-Fi in community spaces and

the library's community. The definition for extended, focused time is a viewpoint that is either global or detailed regarding the issue or initiative. Though only three participants clearly expressed the benefits of extended, focused time, the overall nature of the focus groups was jovial and positive. It appeared as though everyone was delighted to be there and participate based on the participants friendly smiles, engagement with each other, and clarifying questions, which lead me to interpret that overall, the library staff preferred the exhaustive nature of delving into each topic thoroughly. The extended focus was favorable as shown by participant quotes like Alice's, "we don't just look at the big picture, we can take that one topic and look at it and kind of delve into the real meat of the issue for each part of it," and Halee's, "we talk about the topic; we exhaust the topic," and "I think that breaking it down, I mean it's like eating an elephant, you know, one bite at a time. I think that's the best way to do it." The library staff valued having a group who does not normally work together on nuanced projects. As the participant-observer I noted that the focused time "allowed for a focused and consistent discussion on one initiative, through a bunch of lenses" during the final focus group. Despite being time intensive, the ability to focus and discuss and exhaust one topic in one sitting allowed this type of planning to be perceived well. As the participant-observer, I also noted that "at this point, I think this shift in thinking, specifically from a programming team perspective, is a good exercise to generate ideas to reach marginalized groups."

All library staff were not used to implementing a new, academic-style theory into their work. Unpacking the key components of the theory and providing examples in the library field and a bit of time to process was helpful for library staff. Kayla shared:

> As convoluted as I think it felt in the beginning, because we were like, "What was she talking about? This isn't even a language," but I think that you making us walk through

> it, the way you did gave the whole team… we were able to see it, step by step. And that was super helpful because I think had you not done it the way you did it… because, in the middle, I was like, "Why is she doing it that way?" I really was like, "This has nothing to do with what we're talking about and whatever," but then I waited two minutes and then realized it totally did. I hope that we can adjust future projects based on this, and I hope it's well received.

Terminology. Similar to communication, it is important to incorporate globally understood terms and definitions. Early in the diffusion plan development process, the library staff and I noticed that there were many terms that library staff and the public were using that had varying definitions. It was also clear that I, in the role of participant-observer, needed to be explicit when using DOI terminology to minimize confusion. Linda, the only participant with an information technology background, routinely brought up the importance of using appropriate and shared terms. Three other participants brought up the impact incorrect terminology could have on a program like this. If there is not a shared and understood common vocabulary, this is something that should occur at the start of the diffusion planning process. Especially with new innovations, or with innovations that are technological, it seems that there is a strong need for clear and concise language and definitions; for example, some library staff were really struggling with the term *hotspot* and asked, "…what should we call [sic] a hotspot…what are we going to name each hotspot?" and "we really need to retrain everyone to stop saying hotspot." It seems like especially in the world of technological terms there needs to be clear, shared definitions as

Linda, teen librarian and IT specialist, contributed their belief that "where we started going wrong was terminology."

As the participant-observer, I also noted that during the focused meeting for compatibility and complexity that the library staff were very focused on terminology. I wrote,

> It was so interesting to me today how the conversation continually circled around imaginary groups of people who may use the Wi-Fi. It seemed like there was a strong connection and concern about words like 'free' or 'public' and how that might impact someone's decision to use a hotspot. I think because there is an idea of a few specific demographic groups that will utilize this innovation, there are assumptions made on what would make something compatible or complex varies.

Future. The importance of seeing how the innovation impacts the future of the library and the community often came up during the diffusion planning phase. Any thoughts, concerns, or questions about sustainability, staff turnover, exploring predicted impact and any plans that looked beyond the initial implementation of an initiative were tagged with the *future* code. Seven of the eight participants thought beyond the present project and implementation while considering the outlook of this project and similar innovations. The executive director noted that as a library, "we try to be responsive. We also pay a lot of attention to emerging trends in cities." Kayla, with a social service lens, pointed out that there are "concerns about the sustainability of this, you know, the future lens, because, I'll just say any director worth their salt would have a future vision, right? We're not just going to take the thing and move on." Considerations were also made for how society's expectations may be shifting into a post-pandemic world and questions were asked like, "how socially acceptable will it be to just go to the parking lot to finish the paper?" It was also clear that public trust, which will be discussed in the next section,

overlaps a lot with what the future of the library looks like. Through that futuristic lens, the library staff could agree that today's children will grow into tomorrow's adults, so it is important to build trust and relationships with young patrons. The children's librarian, Mya, stated:

> It's hard because it's so far in the future. You have to get the kids on board now and try to lean into that, but at the same time I've always felt like that's the most important part. Getting them to continually come or see the signs and be like, "Oh it's a library thing, yeah, it'll be good."

Procedural Details. It was clear that there was a desire for a more defined workflow in all aspects of the library because items regarding project management, needs assessments, job descriptions and duties, and new ideas for specific innovations constantly came up during phases two and three. It appears a lot of the desire to produce procedure and protocol was driven from a lack of structure and familiar workflow. Six of the eight participants could relate the importance of not only the need for procedural, but a specific need for detail when discussing procedure. Items that related to the procedure that the library staff alluded to in getting an initiative off the ground and items that related to the overarching procedure of how library staff were designing an initiative with DOI elements were tagged with the code of *procedural details*. This code often appeared with the *terminology* and *communication* codes, and even sometimes *barriers*.

Although technology did not specifically come up as a standalone code, the procedural details code was the most closely related to the topic of technology. Linda, who serves the library in an information technology role took a hard stance on the importance of procedures multiple times by stating, "I would say, if you want to be a partner, the requirements are this: you are willing to plug in the device and check it weekly…" and "the most important thing when you're doing a tech initiative is procedure. This is how it works, this is what we do, this is how someone

gets to it." Having the specific lens of information technology presented a more nuanced discussion regarding what is possible when promoting and planning an initiative. The importance of clear procedure prior to unveiling a project was paramount when even the dream scenarios began with procedure as Linda further stated, "here's the dream scenario where I could meet all your needs because we have money…I would start building procedures like how they work."

Barriers. Although instances of barriers and potential barriers can be found thematically to support how library staff develop a diffusion plan, this theme will be fully addressed in the section on research question three.

Ease of Implementation. The ease of implementation plays an important role in how library staff develop a diffusion plan; however, it will be holistically addressed in the section on research question two.

Summary of Themes. In order to provide an overview of the process through which the library staff was introduced to DOI theory and how they developed a diffusion plan based on the innovation of public parking lot Wi-Fi, it seemed that the categorical codes provided three themes: dedicated people and time, clear directions with defined tasks and roles, and a consideration of the sustainability and continuation of the innovation. Though these themes could likely be applied to almost any new initiative or technique for library outreach, it's important to note that even when applying more academic theories in the field of librarianship, it was necessary to include staff with different roles who were dedicated to trying something new. The time to work through a new initiative was also vital for the staff to process the information about DOI theory and think and express in ways that would translate into library outreach. Also applicable to any new initiative are shared definitions and clear tasks. After numerous sessions my notes included that the library staff shared that it was common for them to be working on

something without clear directions or goals. Especially when dealing with technology initiatives or with realms that some patrons may not be as comfortable or familiar with. In some sessions, I noted that library staff made it apparent that clear definitions were needed for terms, phrases, and tasks. Lastly, there was a considerable amount of concern regarding the sustainability of the structure of innovation as verbalized by the participants during sessions and noted in my field notes. Library staff echoed thoughts regarding staff turnover, equipment wear and tear, and other longitudinal concerns. Library staff agreed that the longevity of any innovation would be determined by the clarity of the tasks, roles, and procedure outlined during the development. It was clear that the library staff believed that programs and initiatives are more tenable if the youth are on board and could work to promote the library in unintentional ways.

Research Questions Two and Three

The second and third research questions focus on the stimulators and barriers while developing a diffusion plan for an innovation, respectively. All three phases were observed and examined to answer these questions. Themes and patterns were captured through focus groups, individual interviews, and various documentation. These questions provide information to help answer concerns regarding the feasibility, sustainability, and replicability of implementing this structure.

Cost. The theme of cost is often cited as a barrier regarding why public institutions cannot achieve goals. Although cost is generally related to the financial burden projects or initiatives may incur, for this study the manpower and staff time was included in the theme of cost. Taxes and grants also were grouped into this theme as both positive and negative costs. My notes and reflections highlighted that there was a lot of concern about whether or not initiatives or programs were worthwhile. Library staff members mentioned concerns about the return on

investment or analyzing actual need by asking questions like, “is it enough payback?” and wanting to consider “analyzing need versus cost…” as well as the quality of the initiative. Alice put it succinctly by stating that “free doesn’t necessarily mean good or worthwhile.” Cost was a concern brought up often among participants in managerial and administrative roles.

Public Trust. The trust the public has in the public library is an oft-cited stimulator for broadening public library services into other social services and health services. For this analysis, anything regarding the general population’s interaction (positive or negative) with the library was coded as public trust. The definition of this code was expanded to include how the general population may communicate about or feel toward an organization.

The executive director, LeAnne, recognized that there has been a lot of public trust built between the community, the patrons, and the library. They used specific examples of past programs, such as “our medical partners… find that when they do those things at the library, they have a much larger reach. Because people are comfortable coming to the library. It's not as scary as going into the hospital.” Mya, the children’s librarian, also continued to echo thoughts of generational trust through creating solid relationships with the young patrons of the library. They felt that “you have to get the kids on board now…I’ve always felt like that's the most important part.” Concerns about the public’s overall trust of public Wi-Fi came up during the development phase which is specific to this innovation.

Though only two participants definitively brought up the idea of public trust, all members of the focus groups could relate and resonate with the idea that there is a general trust within the community and the public library. As a subject matter expert, I reassured them that many studies reflect the same belief. As a participant-observer, I interpreted that many, if not all, library staff

operated under the assumption that the general public held the public library in high regard and as trustworthy.

Barriers. Barriers to make a behavior change can be expected in most situations. The theme of barriers included obstacles that potential adopters may face, obstacles that staff may face to get innovation up and running, and most importantly, communication barriers which impact the entire implementation of an innovation and the systematic workings of an institution. All eight participants were able to verbalize and discuss current and potential barriers regarding the innovation or the overall workflow system. There are many different types of barriers and obstacles that were brought up by library staff. Some barriers had to do with initial ideas and how to communicate the transformed idea to the public, noting that "following through with all our great ideas is a more difficult thing," and "we are providing people with what they want. But it's the [communication]..."

Beyond organizational obstacles, library staff recognized barriers for this specific innovation that ran the spectrum of technological problems to lack of confidence. Alice noted that "we're afraid of looking like we don't know what we're doing or like we don't know what we're talking about," while some other library staff worried about the patrons who "might not have the time or wherewithal to be able to troubleshoot." Halee shared concerns about patrons and new technological offerings that are not on library property with library staff support:

> I worry about the people not willing to try. I would worry about people thinking that it's going to be too complicated and have no idea where to do it. I think that would be something that I would be concerned with.

Adjacent to lack of confidence, it was noted by the participant-observer that "another barrier that was mentioned was the embarrassment that may come along with needing free Wi-Fi. Students

and adults alike may feel embarrassed if they don't have the internet at home so making sure there are passive ways to get information without shaming someone was brought up."

The final category of obstacles included how community members might react to programs that are not directly related to library materials. For instance, this library has taken on a role referring patrons to various social services. This interpretation of their mission statement has been met with some negative responses such as "there's so many people in the community who think the library is doing too much or it's not their responsibility."

Ease of Implementation. Like the barriers theme, it was valuable to recognize what made this type of development easy, possible, and perhaps even generalizable to other, similar institutions. The perception of the library staff to implement suggestions made during focus groups and interviews were coded under this theme. A positive association with time and cost associated with implementation was also coded under this theme. Similar to cost, only three participants noted the how easy it was to implement DOI elements into general outreach and the specific steps of the implementation plan, but the general stance toward the project and plan was positive and met with agreeable attitudes.

There was a futuristic lens through which some library staff considered implementing the same protocol at different libraries. LeAnne, the executive director was pleasantly surprised by the amount of work completed but said, "I think [it's] all very doable and when you're presenting things like this to public libraries if it's not easy, they won't do it." She expanded further by stating after she reviewed the developed plan that:

> It's not a ton of work. We just have to make it a priority, and I'm certainly willing to make it a priority with Megan and those people who I speak for that aren't in the room. Because I give them their to-do list so I'm happy to do that. I think it's important enough.

Halee, the public program and outreach manager, mentioned that “it would be a really good framework to kind of get [library staff] thinking about what is the best way to get this idea out there and to make sure that it spreads.” There was genuine pride in the work that was completed as the staff excitedly approached me outside of sessions about the project and eagerly participated in the final focus group with the executive director. Some of the other library staff considered the direct result of the work they did and the impact it will have after implementation. Eliana recognized:

> We already have, you know, like the bones; we have the framework, you have the structure there. I do think we need to give it some more love and to make it become more, you know, just pick it up a little bit, but I think it's there.

It should also be noted that, as the participant-observer, I noticed a perceived genuine connection between the library staff and their patrons. I wrote, “because the public library staff is well versed with various community partnerships and knows their patrons well, they are able to recognize specific groups (even if they don’t come to the library) and their potential needs."

Summary of Themes. Research questions two and three focused on the obstacles and support the participants perceived during the development phase. The barriers the library staff were able to acknowledge included cost (both time and money), communication, and lack of community support. Although the financial and labor cost are likely obstacles, these are specifically important to public libraries where budgets are generally very tight. It was surprising to me as these types of decisions or obstacles are usually made at administrative levels of library staff, but all levels of staff had a general awareness and worry of spending time or money inappropriately. The library staff also recognized the difficulty of successfully doing anything without clear and transparent communication from all stakeholders. Though this appeared to be

an issue throughout the organization regarding a variety of initiatives, I found the continual mention of clear communication, or lack thereof, a barrier in the ability for the library staff to develop a clear diffusion plan without distraction or worry of how it would truly be implemented. Finally, some library staff expressed a concern about whether or not their community would support programs and initiatives that were not typical or historically provided by library services. Many libraries include mission statements that allude to the library being a community center, or hub for all to learn, enjoy, or enhance their lives through curated resources. Although many initiatives beyond books seem to fit into mission statements, the addition of public social services has not been positively received by all community members.

It was the general perception among library staff that going through the process of learning about DOI theory and how it can be applied to public library outreach seemed nebulous at first, but once the group discussions began the commonalities were apparent and were often applied in unconventional ways. For example, a participant thought it would be great to highlight trialability by creating a tutorial video for the potential adopters. This idea was not new for library staff as they often create tutorials for a variety of initiatives, especially since the pandemic began. Additionally, the entire study took about ten weeks to complete and at least five of those weeks included intensive meetings with library staff and the work of developing a diffusion plan with DOI components. The work was not easy, but the perception was that it was easy to implement through a design process of extended meetings on focused topics with staff from various departments.

Research Question Four

The last research question aligns DOI theory with the work the public library staff was doing during phase two, the design phase. The library staff did not have background knowledge

in DOI theory and were introduced to it through foundational presentations that included handouts during phase one, the preparation phase. As DOI theory is known as a communication theory, data tagged with the *communication* code were also tagged as *result* for this question. All three phases were observed and examined. Themes and patterns were captured through focus groups, individual interviews, and documentation. This question directly supports results from research question one to further reinforce the purpose of this study. The library staff were most comfortable with crafting promotional efforts but could easily discuss and implement ideas to honor DOI characteristics such as relative advantage, compatibility, and complexity. It was more difficult for the library staff to actualize examples or efforts of trialability or observability.

Communication. This theme is defined by the communication (or lack thereof) within an organization. This code also included communication with patrons. Communication could occur via mass media or through word of mouth. This theme was prominent in almost every phase and every data collection opportunity, whether it was a researcher memo or during a focus group. Six of the eight participants mentioned communication despite the clear overlap that communication has with working on promoting, marketing, and advertising a program. Additionally, there appeared to have been pre-existing communication gaps within this public library staff.

Some of the reflections regarding communication and broken communication chains were fraught. Mya emotionally stated that “we want this to be part of the community, but in order to do that, we have to have open communication and, obviously, that was lacking incredibly.” Mya further considered that idea by demonstrating how they considered communication one of the most essential components of whether or not a good idea can be carried through by stating, “out of everything that has happened with all of our meetings, I really feel like that kind of communication has been the most important with what we’re doing.”

The library staff were able to recognize the need to meet patrons, potential adopters, where they are. The library staff also verbalized that different groups of patrons get their information in different ways. Eliana, who focuses on outreach, stated that "pushing that stuff out not only to mainstream social media like Facebook and Instagram, but NextDoor, you never know who's connected on that," which highlighted not only the usefulness of social media, but how it is more similar to word of mouth than mass media communication. This was emphasized through my participant-observer notes when I,

> saw the participants begin to recognize a need for interpersonal communication, again, especially with marginalized groups and those who do not consistently have access to the internet or library announcements. For instance, if someone learned of the Wi-Fi program, they could let a neighbor who doesn't have the internet know.

The library staff also recognized the importance of valued opinions throughout the community, especially with nuanced populations. Field notes from the participant-observer included comments from library staff such as "this is where the 'hook up' person came into play…the Russian 'cheese' guy or someone else that has an in with a particular community and could share information and be trusted." This compounded the importance of word-of-mouth communication with the public trust element.

Other important subtopics came out of data collection opportunities including using common vocabulary and clearly defining what elements of the initiative are, both for staff and the public; the recognition that interpersonal communication is more time intensive, but has more return on the investment; the need for universal design; the desire for a town crier in the 21st century; and advertisements that lacked detail or other languages.

DOI Characteristics. At the core of this study is the ability for public library staff to implement DOI theory elements into the design and implementation of an innovation and subsequent diffusion. A few examples of what an innovation could be at a public library are: a new program, a new service, or an update to rules and expectations. The complexity of this theory can be concentrated into a few key elements that may make it easier for the layperson to interpret and apply. The focus of the public library staff implementation was on three of the variables that determine the rate of adoption, including the five characteristics of DOI theory. The variables studied were communication channels, extent of change agents' promotion efforts, and innovation characteristics. The five characteristics are (1) relative advantage, (2) compatibility, (3) complexity, (4) trialability, and (5) observability.

The characteristics are also what drove the focus groups during the design phase. Each focus group meeting was centered around one or two characteristics to allow for a concentrated conversation. The final diffusion plan was also tagged with the characteristics to align the plan to DOI theory. While the diffusion plan may vary for different libraries and different innovations, the library staff were able to develop outreach strategies that were rooted in DOI theory by crafting a template that included phrases like "all efforts should state clear expectations to ensure the *compatibility* and low level of *complexity* of the innovation," and "programs for targeted audiences should include 'field trip' opportunities to promote *trialability* and *observability*."

The unique nature of working on a diffusion plan for an innovation that is already available to potential adopters gave the library staff a singular lens through which to gauge what was working well and what could use improvement. In my role as participant-observer, I noted that library staff were able to identify flaws in the current set up like:

Some people don't want to go to churches for Wi-Fi, or perhaps because there aren't

lights. But mostly, it's hard for people to know where these little corners are. A suggestion of yard signs pointing people in the right direction would also serve to inform all citizens of the service and potentially share with others. Awareness would go a long way.

Summary of Themes. At the core of the public library's work are the patrons. Many public library mission statements include words like "everyone," "community," and "all patrons" in an effort to be clear on the inclusive work and services they offer. While crafting important messages is important, the patrons need to know the library staff cares about them. The library staff proved their desire to put patrons first when they constantly worried about the complexity of the innovation. Most of the library staff's woes stemmed from communication errors that would result in a patron having a bad first interaction with the innovation and giving up or technical malfunctions that would result in a frustrated and angry patron never trying a library service again. The second most important element was meeting the needs of the community (in this case, providing internet access at public and safe locations in the community) by making sure the potential adopter perceives positive benefits with parking lot public Wi-Fi, which once again put the patrons at the heart of the diffusion plan. Compatibility, trialability and observability were not among the most applicable or urgent DOI components when diffusing parking lot Wi-Fi.

Summary

The library staff provided data through three phases and multiple techniques were employed to collect data such as interviews, participant-observation, and field notes. Specifically, during phase two, the library staff were eager to discuss ways to enhance their promotional efforts and were encouraged by the opportunity to learn and use new strategies to

inform and attract more potential library users. Despite DOI theory coming from an academic lens, the library staff was able to process and apply most components to a diffusion plan specific to the innovation of parking lot public Wi-Fi.

CHAPTER V

DISCUSSION AND CONCLUSIONS

In this chapter, I will examine the result of this case study. The results of the study provided valuable insights into the expansion of library outreach and promotional efforts by utilizing components of the DOI theory. As DOI theory is primarily a communication theory, the use of its elements in public library outreach can have a positive impact on the strained budgets and staff of public libraries in America. Relatively easy-to-implement changes to promotional efforts and communication plans by building a diffusion plan could allow for exponential spread of library services.

Discussion

The qualitative nature of this study provided copious amounts of data to help provide answers to the research questions posed at the beginning of this study. The research questions focused on the potential ability of library staff to implement elements of DOI theory into their outreach efforts. Specifically, I sought to find data to explore the process through which public library staff develop a diffusion plan to promote an innovation, in this case parking lot Wi-Fi hotspots while using DOI theory components by addressing the following research questions: (a) how did public library staff develop a diffusion plan to implement parking lot Wi-Fi hotspots using DOI theory?, (b) how did public library staff address stimulators when developing a diffusion plan to implement parking lot Wi-Fi hotspots using DOI theory?, (c) how did public library staff address barriers when developing a diffusion plan to implement parking lot Wi-Fi hotspots using DOI theory?, (d) which DOI innovation attributes did public library staff find most applicable to diffusing parking lot Wi-Fi hotspots and why? At an even more granular level, I sought to find data on how public library staff addresses stimulators and barriers during

the development process as well as which DOI innovation attributes public library staff find most applicable to diffusing public parking lot Wi-Fi. As noted above, through this study I sought to provide a foundational understanding regarding the ability for public library staff to use DOI theory elements in promotional efforts. In order to analyze the process of using DOI elements while developing a diffusion plan for public parking lot Wi-Fi the library staff had to go through the process of developing a diffusion plan. Although the template (see Appendix G) the library staff created is not analyzable data for this study, it serves as evidence that this type of implementation is possible by following the steps I outlined in the design of this study.

Various studies support the fact that libraries find innovative ways to meet the needs of their patrons (Potnis et al., 2019; Huwe, 2020). Especially when dealing with budget limitations, pandemic restrictions and staff turnover, libraries were almost forced to make lemonade out of the particularly sour situation many of them faced. Majority of libraries responded to needs that were specific to the COVID-19 pandemic and related needs (Wyatt, 2021). Although it could be argued that internet access is an essential utility, the fact is that it is not currently acknowledged as such in the United States and public libraries are often the location where many people go for internet access, whether with their own devices or by using computers in the library. The pandemic related shutdown highlighted the number of people who do not have reliable access to the internet at home. Libraries continued to be responsive to their community needs throughout the pandemic, but there were many potential adopters (not yet library patrons) who were unaware of the innovative solutions available to them in their community.

Diffusion Plan Process

The three-phase process through which the library staff in this study worked to learn about DOI theory, develop a diffusion plan, and fine tune it with an intention of implementation

brought forth clear themes in order to achieve desired outcomes. There is a need for dedicated people and time, clear direction that includes shared definitions, and a consideration for sustainability.

The process used in this study allowed staff time to understand and apply DOI elements in a safe environment. The development stage was designed to provide long periods of focused time on specific elements to draw out and exhaust conversation, but also to allow thoughts and conversations to marinate and be applied to later concepts. The process also aligned with the instructional design process of analysis, design, develop, implement, and evaluate (ADDIE). The library staff were able to analyze, design and develop an initial diffusion plan over about four weeks. Implementation was discussed and planned during the final phase and evaluation is forthcoming.

Dedicated People and Time. When designing for diffusion, there must be clear priority setting from the beginning (Brownson et al., 2013). This type of prioritization can be addressed through multiple, focused meetings with internal stakeholders (i.e., library staff). Early developmental phases may not include external stakeholders, potential adopters (library patrons) as diffusion plans are iterative and will likely change throughout the course of diffusion (Dearing & Cox, 2018). Including library staff from various departments, many of whom have diametrically different personalities served to increase the viewpoints and angles with which the discussions evolved. Library staff were eager to discuss ideas and innovations, ways to improve current offerings, and how they communicate with library patrons. Their open nature emphasizes the importance of capitalizing on the opportunity to align the familiarity library staff has with communicating with the public and their knowledge of community needs. This is a thematic

topic that can be layered on most answers to the research questions and will appear throughout this chapter.

Due to the nature of library staff generally being well acquainted with library patrons and the general community through other social service programs, the library staff were able to act as proxy stakeholders during this iteration. Though the theme of dedicated people and time originally had more to do with making sure the library staff had specific people consistently associated with the project and were given paid time to work, it started to become clear that dedicated people and time had an alternative, and just as important, meaning. Because this specific innovation was targeted towards potential adopters who may not use the library or who may not consistently think to come to the library for social services, it became a challenge for the library staff to act as proxy for the stakeholders who were not present. It was also a challenge for library staff to empathize or imagine during some focus group exercises when they did not have a full understanding of a program or innovation themselves.

The importance of understanding information seeking behaviors, or the time and ability to have exercises dedicated to thinking about how a specific individual might try to locate free Wi-Fi was essential to the credible creation of a diffusion plan. McKenize's model (2003) of information seeking behaviors outlined four practices. Two of those modes are highly applicable and similar to the efforts made by the library staff in this study. The first mode, non-directed monitoring, can be identified as an individual who serendipitously came across helpful information (for themselves or someone they know). McKenzie (2003) provides the example of chatting with acquaintances in her work which is exactly what the library staff discussed amplifying through social media or change agent promotional efforts. The second mode that is

applicable is by proxy which the library staff also discussed as ways to target non library users through other social service organizations.

As mentioned in chapter four, there was a consistent concern about terminology, both within library staff and with potential adopters. The staff could recognize the value in DOI theory in other programs, but because there was a looming worry about terminology, conversations often circled back to communication. Many public libraries do not have the budget to employ full time communications departments, so library staff are comfortable with communication, but that doesn't mean their efforts are effective or efficient. The very fact that the library staff in this study could recognize the value of DOI components as well as the importance of utilizing mass media in certain situations and seek to enhance interpersonal conversations in others was another step towards effective and efficient public library outreach.

Clear Directions and Definitions. Although it seems intuitive, the need for clear direction and shared definitions are necessary to make progress when developing a diffusion plan. Identifying stakeholders, tools, systems, and standards are key principles when designing diffusion (Brownson et al., 2013). Though much of the desire to have clear direction and shared definitions was born out of frustration due to communication breakdown and systematic issues, it is a valid point to consider when undertaking the design of a diffusion plan, especially in early stages.

The innovation being developed needs to have a reason for being pushed out, or there will be little buy in from anyone. The decision makers and implementers need to have a frank discussion that outlines the reasons for the innovation. The library staff clearly recognized a need, especially during the pandemic, that the community needed to have more options and locations to be able to connect online for school, work, health, or social reasons. Once clear

directions, tasks, roles, procedures, tools, and techniques have been clearly defined for the innovation during a preparation stage, the stakeholders involved with the early diffusion should consider and discuss who the audience is. Next, they should list possible community partners while keeping in mind why the innovation is necessary and who the library is trying to reach. Just as libraries create innovative solutions to their community's problems, they are also innovative when it comes to ways to communicate (Charles, 2012). The importance of utilizing various communication methods and community partnerships to help meet the audience can serve to increase the impact of the innovation itself (de Greef et al., 2020). The importance of interpersonal communication also helps impact the likelihood of adoption (Bonnici & Ma, 2019; Chatman, 1986; Katz & Lazarsfeld, 2017; Kreps, 2005; Malachowski, 2014; Morgan et al., 2016), which the library staff sought to do through social media as well as social services and well known and trusted individuals serving as change agents.

Sustainability. Sustainability does not often come up in the literature for diffusion design. In fact, widespread diffusion is not the typical outcome for most innovations (Dearing & Cox, 2018). The ability for the library staff in this study to consider the future during the development phase spoke to their loyalty to the library and the innovation. Despite the odds of many of the library staff likely being in a different position, perhaps in another library, within the next two years, there was an authentic consideration of how parking lot Wi-Fi hotspots could be better for this community. This type of compassion is likely why so many individuals have trust in their local libraries (Cabello & Butler, 2017; Costello & Keyser, 2016), which gives libraries the ability to attempt new and sometimes unlikely solutions to problems the staff recognizes in the community. Furthermore, the fact that this library already had partnerships with many community organizations works to strengthen the public's attitude toward libraries providing

social services or being a service point and work to build social capital (Johnson, 2012; Johnson, 2019). Dearing and Singhal (2020) noted how often implementation and sustainability factors are overlooked in diffusion design, but this study did include those factors to strengthen the diffusion plan.

An element that could have been more direct during this study is the focus on audience. Library staff were able to come up with many different groups of people who could potentially need to access free, public Wi-Fi but the discussion generally ended with naming the group. Although there was some consideration for the audience, the groups the library staff came up with have very different needs, information seeking behaviors, and communication preferences. Buchanan et al. (2018) and Chatman (1986) both highlighted the need to identify key communication channels or the target audience to increase the likelihood of diffusion and adoption. Buchanan et al. (2018) found that by focusing on the audience it also serves to minimize concerns of information literacy and misinformation. Although it was briefly mentioned at the start of the study, there was a lack of substantial consideration to a potential adopter group that is not typically marginalized, such as the "smart cousin" who pays for a subscription service instead of utilizing free library digital audiobooks.

Applicable Elements of DOI Theory

The more specific use of DOI as public library outreach and promotional efforts during this study echoed what Beaunoyer et al. (2020) found while trying to minimize digital inequities, especially in times of crisis. Beaunoyer et al.'s work highlighted that digital inequities do not just include access inequality, but also technical means, autonomy of use, social network support, and experience. Those inequities were of constant conversation and concern during the development of the parking lot Wi-Fi diffusion plan. That led the library staff to focus on the

DOI elements of complexity and relative advantage, which are two common focal points that affect adoption (Brooks et al., 2014; Valier et al., 2008).

The library staff were good community listeners. They often showed up to development meetings with new ideas and more information about the community. Sometimes their ideas came from attending an event and just listening, other times questions were born from a discussion with community partners or an informal analysis of sociological community data. Though not explicit, these are all behaviors that align with diffusion development (Dearing & Kreuter, 2010; Valier et al., 2008). In fact, Rogers (2003) stated that community behaviors, system norms, and social networks all play into the likelihood of adoption. The library staff's relational awareness of community needs helped drive the diffusion plan which should lead to a more successful implementation (de Greef et al., 2020). The library staff's focus on the community is a clear example of them targeting the relative advantage of public Wi-Fi in community parking lots.

The constant conversation about communication with attention placed on both internal and external issues highlights the desire to mitigate the complexities that arise when implementing technology with live support. Rogers (2003) posited that the naming and positions of an innovation can be viewed as a compatibility factor which the library staff brought up at almost every development session. The collaborative design of library staff from varied departments with different personalities, perspectives and experiences enhanced the diffusion plan. Hartzler (2015) found that this type of collaborative design also has a positive impact on implementation and effectiveness. Furthermore, as mentioned earlier, the explicit focus on an audience's interpersonal communication channels could have been more detailed to align with other DOI studies (Bonnici & Ma, 2019; Chatman, 1986; Katz & Lazarsfeld, 2017; Kreps, 2005;

Malachowski, 2014; Morgan et al., 2016). The library staff did acknowledge the importance and timing of both mass media and interpersonal communication and came to the conclusion that they constantly need to offer both as this particular innovation does not have a firm start and end date, so potential adopters could always be at the persuasion state of the innovation-decision process.

The diffusion plan that the library staff created is set to be implemented by the public library in the coming months. Most library staff agreed that this type of process and using a DOI template is easy to implement if time and clear direction are provided. Barriers can vary in different locations, but barriers regarding cost and community support are likely to be present in other locations. Systemic and structural issues, such as communication breakdowns and unclear workflows are known barriers to innovation in libraries (Zbiejczuk Suchá et al., 2021).

This study contributes to the field of instructional design and technology by providing an example of the process through which DOI theory can be applied to education-adjacent fields. The three-step process proved to be successful in providing layperson understanding, development, and implementation of an academic theory. As mentioned in the introduction, the ADDIE process could expand the research done in this study to further mitigate implementation challenges. In addition, this study expands DOI theory in a conceptual manner by applying DOI theory outside the communication field and in the field of librarianship. Furthermore, the application of DOI theory to public library outreach contributes to the field of librarianship by offering an alternative technique to expand library users and broaden the scope with which services and programs are currently benefiting. This technique could be applied with relative ease and little resource and financial commitment. Combined with the core function of libraries providing resources and cultivating relationships between community partners and individuals,

the additional layering of DOI components will strengthen library communication efforts and increase library outreach.

IDT in Public Library Programming. Librarians are generally not drawn to the field for fame and riches. Like many public facing and pubic serving positions in American society, it is a career that focuses on serving others by providing resources to enhance their lives at no cost. Public libraries are situated to be able to serve all community members and visitors, and many library staff have the experience and or training to be able to meet the needs of library patrons on the spot. One discernable implication from this study is that library staff are not only well equipped to recognize the needs of library users, sometimes even before the individual does, but they are prepared to assist to find a possible solution.

Libraries have struggled with minimal budgets, staff turnover, and extended needs in their communities for years (Howard, 2019). While their best efforts at communications, marketing, and other promotional strategies have skimmed the surface, in order to be as efficient as possible, public libraries need to strongly consider implementing theories, models and approaches rooted in the field of IDT. As the breadth of services and resources offered at local libraries continues to span a wide spectrum that includes educational, entertainment, and social services there needs to be a way to streamline communication and promotional efforts to reach as many potential library users as possible. The benefits of implementing IDT processes and theories into library systems would have an exponential impact not only on the communication and promotional efforts of public libraries, but on the creation and design of library programming. This study can be used a model for libraries to begin implementing DOI and ADDIE components.

Applying elements from DOI theory and the ADDIE process can not only reach more community members but can reach other community members who may be able to support the library in a variety of ways, including but not limited to financial and in-kind donations. Reaching more community members can also support libraries by creating a snowball effect on the way information about library programs and services are spread through interpersonal communication, reaching some of the more exclusive members of the community. At the heart of both librarianship and instructional design is learning. An important component of learning is communication. The principles of both learning and communication are not often, if at all, taught in library science programs in a way that aligns to the field of IDT. The depth that DOI theory and the ADDIE process could add to the field of librarianship through changes in outreach could have an expanding impact on individuals by making efforts more effective and efficient while highlighting other areas within the larger library staff workflow system that could be streamlined.

The systematic approach that is centered in IDT can be applied to realms outside academia (and often is applied to less structured environments). Libraries are central hubs for learning, whether the learning is an academic lens, or more informal, perhaps even unknowingly. Training library staff to use their knowledge of the needs of a learner to develop specific intervention to help the learner meet their end goal will result in a more efficient way for libraries, particularly those under tight budget and staff restraints, to run. It will also result in a more pleasing and successful learning opportunity for the library user.

Conclusion

The purpose of this study was to determine the possibility of non-DOI experts', in this case public library staff, ability to apply DOI theory components to promotional efforts, in this

case outreach for parking lot Wi-Fi hotspots. Public libraries have been known to respond to the needs of their patrons, well beyond academic or literary needs (Horrigan, 2016; Howard, 2019; Zalusky, 2020). Although public libraries have creatively come up with temporary and permanent solutions to problems faced by community members, not all community members are always aware. Some libraries have marketing teams and social media has helped democratize the ability to spread information, but still many libraries do not have a high percentage of community adoption for any program. It is important to note that some community members may not have a need or desire to participate in some programs, such as children's story time or a health screening as patrons may not have children or have other access to healthcare. Public libraries are sustained on the foundation of serving all members of society and that includes social services. As public libraries are generally trusted institutions (Howard, 2019; Zalusky, 2020), they are great community centers to provide not only educational and entertainment resources to their patrons, but also to provide social services such as tax preparation or internet access.

In an attempt to stretch already thin library budgets further, components of communication theory, DOI, can be applied to the communication efforts to enhance the diffusion of a public library program or initiative. Furthermore, DOI components can increase the likelihood of adoption. Although DOI has many complex nuances and academic implications, there are many elements that can be understood and adopted by individuals who are not familiar with DOI theory or may not have a subject matter expert available. This study focused on two elements and five characteristics that have been shown to increase the likelihood of adoption: (a) communication channels and promotional efforts, (b) relative advantage, (c) compatibility and complexity, (d) trialability and observability (Rogers, 2003). The important

ones to focus on during public library outreach and associated promotional efforts are relative advantage and complexity.

Many innovations fail to diffuse and even those that do diffuse are not widely adopted (Dearing & Kreuter, 2010). Although the goal of any library programming department is not to host one program that's perfect for everyone but to host a wide variety of programs that are individually perfect to some people, a more robust diffusion plan would allow for more opportunities for interpersonal communication to occur and target by proxy information seekers (McKenzie, 2003) creating an accelerated improvement on library promotional efforts as well as increasing the trust in libraries and general awareness of expanded services.

Even a small increase in diffusion of library services, programming, and innovations by aligning library outreach and promotional efforts with DOI theory can prove to have exponential impacts on many individuals' lives by providing vital information and services for free to individuals in need while also increasing the word-of-mouth communication about such services. Budget cuts, staff shortages, and other library challenges were mentioned many times in this dissertation, but these issues are not limited to just public libraries as many school libraries face similar challenges (Kachel & Lance, 2021). To exemplify the importance of effectively diffusing library services, programming and innovations can provide students who may attend school without a certified school librarian with resources to even the playing field for every student's educational journey. In current events, the trend of book challenges and censorship may restrict access to important resources, but many public libraries are responding with expanded offerings such as digital library cards for all teens (Shivaram, 2021).

Future Research

This study demonstrated that public library staff can implement DOI elements into their promotional efforts for a technological innovation. However, this study included a researcher who also played the role of participant-observer and subject matter expert. Additionally, this study focused on the design of a diffusion plan, not on the implementation or adoption of the innovation. Future research includes many avenues for perusal including replication of the study with a non-technological innovation, replication of the study without a subject matter expert, evaluation of the implementation of the diffusion plan, and of course, the adoption rate of the innovation.

Recommendations

First and foremost, this study ends with the development of a diffusion plan. It seems that the first next step would be to evaluate the implementation of the diffusion plan and to analyze the adoption rate of library patrons based on changes to the innovation and communication efforts. Initially, many DOI studies were focused on adoption rates so a study on patron adoption rates, likely tied to the individual's adoption categories, would not be difficult to design. The results of an adoption study would help solidify the impact DOI elements can have on public library outreach efforts, with or without a subject matter expert. Studies that include stakeholders like potential adopters would also serve to solidify the positive impact of DOI in public library outreach and promotional efforts.

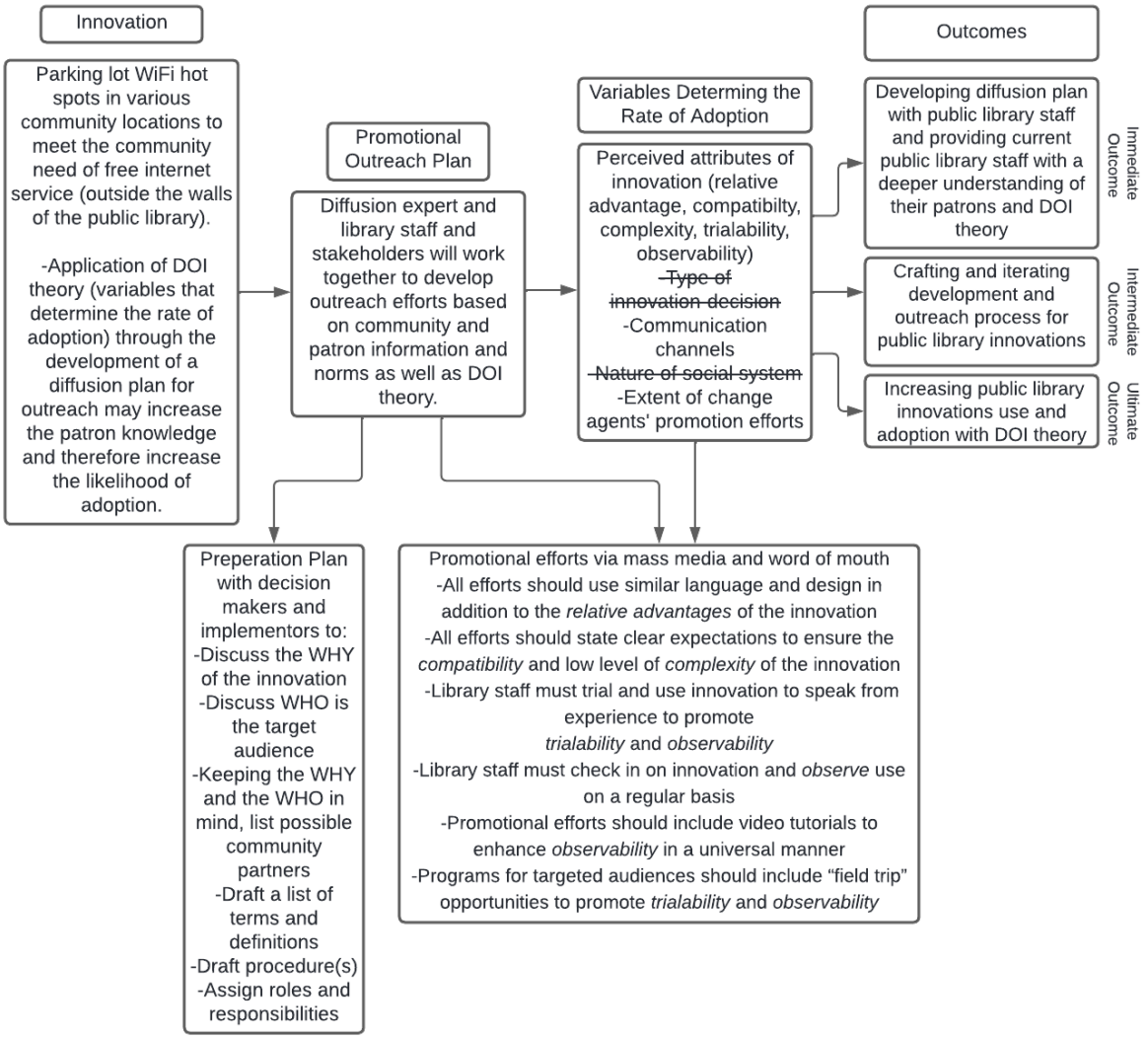
Logic Model

A logic model helps visually represent the process through which the library staff developed the diffusion plan for public parking lot Wi-Fi. While the logic model was initially developed as a form of analysis, the model now serves to illustrate the process of development

throughout the study. Figure 4 below extends the anticipated model to highlight the steps library staff perceived as necessary. The logic model was used in this study to highlight the process and provide a template for future studies or implementation.

Figure 4

Logic Model for Public Library Outreach with DOI



To further illustrate the impact of DOI elements in public library promotional efforts for initiatives and programs, additional research could focus on non-technological innovations and

innovations for varying target audiences. The nature of public libraries is to provide and as long as there is some type of funding, be it local taxes, federal grants, or generous donations, the public library system will continue to do what they can and prioritize offerings to best match the perceived needs and wants of their communities. In a world where needs, educational, social, vital, entertainment and otherwise, are increasingly not being met by traditional means, the library, a democratized and communal center of many towns and cities, can help meet those needs. So as to stretch budgets and staff time, implementing DOI elements in promotional efforts could be a small way to offer assistance and enrich many people's lives.

References

ALA Office for Diversity, Literacy and Outreach Services. (2019). *Keys to engaging older adults* [Guide]. American Library Association.

Ashworth, B. (2020, March 25). *Covid-19's impact on libraries goes beyond books*. Wired. https://www.wired.com/story/covid-19-libraries-impact-goes-beyond-books/

Atske, S., & Perrin, A. (2021, July 16). *Home broadband adoption, computer ownership vary by race, ethnicity in the U.S.* Pew Research Center. https://www.pewresearch.org/fact-tank/2021/07/16/home-broadband-adoption-computer-ownership-vary-by-race-ethnicity-in-the-u-s/

Beaunoyer, E., Dupéré, S., & Guitton, M. J. (2020). COVID-19 and digital inequalities: Reciprocal impacts and mitigation strategies. *Computers in Human Behavior*, *111*. https://doi.org/10.1016/j.chb.2020.106424

Benson, D. (2022, January 3). *Why your local library might be hiring a social worker*. NPR. https://www.npr.org/sections/health-shots/2022/01/03/1063985757/why-your-local-library-might-be-hiring-a-social-worker

Boekesteijn, E., Wilms, L., & Kleppe, M. (2017, December). From idea to implementation: How the Dutch national library is championing innovation. *Information Today*, *34*(10), 28-32.

Bonnici, L. J., & Ma, J. (2019). Public library engagement in diffusing a planned community health initiative: A dual case study. *Public Library Quarterly*, *38*(2), 160-178. https://doi.org/10.1080/01616846.2018.1559713

Brooks, S., Brown, S., Davis, D., & LeBeau, J. (2014). Adoption of technological innovations: A case study of the ASSESS website. *Advances in Engineering Education*, *4*(1), 1-24. https://files.eric.ed.gov/fulltext/EJ1076074.pdf

Brownson, R. C., Jacobs, J. A., Tabak, R. G., Hoehner, C. M., & Stamatakis, K. A. (2013). Designing for dissemination among public health researchers: Findings from a national survey in the United States. *American Journal of Public Health*, *103*(9), 1693-1699. https://doi.org/10.2105/AJPH.2012.301165

Buchanan, S., Jardine, C., & Ruthven, I. (2018). Information behaviors in disadvantaged and dependent circumstances and the role of information intermediaries. *Journal of the Association for Information Science and Technology*, *70*(2), 117-129. https://doi.org/10.1002/asi.24110

Cabello, M., & Butler, S. M. (2017, March 30). *How public libraries help build healthy communities*. Brookings. https://www.brookings.edu/blog/up-front/2017/03/30/how-public-libraries-help-build-healthy-communities/

Casucci, T., Gregory, J. M., & Shipman, J. P. (2016). Appy hour: Health sciences professionals learn about apps. *Medical Reference Services Quarterly*, *35*(3), 251-258. https://doi.org/10.1080/02763869.2016.1189777

Charles, C. (2012, November 15). *Can I check this out? : Circulating collections beyond books, CDs, and DVDs*. Public Libraries Online. http://publiclibrariesonline.org/2012/11/can-i-check-this-out-circulating-collections-beyond-books-cds-and-dvds/

Chatman, E. A. (1986). Diffusion theory: A review and test of a conceptual model in information diffusion. *Journal of the American Society for Information Science*, *37*(6), 377-386. https://doi.org/10.1002/(SICI)1097-4571(198611)37:6%3C377::AID-ASI2%3E3.0.CO;2-C

Corbin, J. M., & Strauss, A. L. (2015). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (4th ed.). SAGE.

Costello, D., & Keyser, C. (2016). Meet them in the moment: Engaging public library patrons when it matters most. *Weave: Journal of Library User Experience*, *1*(4). https://doi.org/10.3998/weave.12535642.0001.404

Dali, K., & Brochu, L. K. (2020). The right to listen. *Library Resources & Technical Services*, *64*(3), 106-119.

Dearing, J. W. (2009). Applying Diffusion of Innovation theory to intervention development. *Research on Social Work Practice*, *19*(5), 503-518. https://doi.org/10.1177/1049731509335569

Dearing, J. W., & Cox, J. G. (2018). Diffusion of innovations theory, principles, and practice. *Health Affairs*, *37*(2), 183-190. https://doi.org/10.1377/hlthaff.2017.1104

Dearing, J. W., & Kreuter, M. W. (2010). Designing for diffusion: How can we increase uptake of cancer communication innovations? *Patient Education and Counseling*, *81*, S100-S110. https://doi.org/10.1016/j.pec.2010.10.013

Dearing, J. W., & Rogers, E. M. (1996). *Agenda-setting*. Sage.

Dearing, J. W., & Singhal, A. (2020). New directions for diffusion of innovations research: Dissemination, implementation, and positive deviance. *Human Behavior and Emerging Technologies*, *2*(4), 307-313. https://doi.org/10.1002/hbe2.216

de Greef, M., De Donder, L., Lambotte, D., Huysmans, M., Duppen, D., Hoens, S., Croux, F., Switsers, L., Pan, T., Colpin, N., Petti, S., & Kish, I. (2020). Increasing the impact of innovation and advocacy in public libraries across Europe. *World Studies in Education*, *21*(1), 25-44. https://doi.org/10.7459/wse/21.1.03

Developing and implementing a simple media/communications plan. (2020). American Library Association.

https://www.ala.org/advocacy/advleg/publicawareness/campaign%40yourlibrary/prtools/handbook/media-plan

DeWalt, K. M., & DeWalt, B. R. (2011). *Participant observation: A guide for fieldworkers* (2nd ed.). Rowman & Littlefield.

Dixon, J. A. (2017, November 28). National library partnership tackles health literacy gap. *Library Journal*, *143*(1). https://www.libraryjournal.com/?detailStory=national-library-partnership-tackles-health-literacy-gap

Dowdell, L., & Liew, C. L. (2019). More than a shelter: Public libraries and the information needs of people experiencing homelessness. *Library & Information Science Research*, *41*(4), 100984. https://doi.org/10.1016/j.lisr.2019.100984

Doyle, G. J., Garrett, B., & Currie, L. M. (2014). Integrating mobile devices into nursing curricula: Opportunities for implementation using Rogers' Diffusion of Innovation model. *Nurse Education Today*, *34*(5), 775-782. https://doi.org/10.1016/j.nedt.2013.10.021

Fallows, D. (2020, March 31). Public libraries' novel response to a novel virus. *The Atlantic*. http://theatlantic.com/notes/2020/03/public-libraries-novel-response-to-a-novel-virus/609058/

Forsyth, S., Penzkover, K., Davis, P., & Matty, I. (2020, July/August). Design thinking in public library: Makerspaces. *Public Libraries*, *59*(4), 58-64.

Garmer, A. K. (2014). *Rising to the challenge: Re-envisioning public libraries : a report of the Aspen Institute dialogue on public libraries*. The Aspen Institute. https://csreports.aspeninstitute.org/documents/AspenLibrariesReport.pdf

Gibbert, M., Ruigrok, W., & Wicki, B. (2008). What passes as a rigorous case study? *Strategic Management Journal*, *29*(13), 1465-1474. https://doi.org/10.1002/smj.722

Gibson, J., Fitzgerald, B., & Fisher, C. (2019, May/June). Alice Springs library exploring service with Mobile Max. *INCITE*, *40*, 26.

Giesler, M. A. (2017). A place to call home?: A qualitative exploration of public librarians' response to homelessness. *Journal of Access Services*, *14*(4), 188-214. https://doi.org/10.1080/15367967.2017.1395704

Giesler, M. A. (2019). The collaboration between homeless shelters and public libraries in addressing homelessness: A multiple case study. *Journal of Library Administration*, *59*(1), 18-44. https://doi.org/10.1080/01930826.2018.1549405

Goldman, K. D. (1994). Perceptions of innovations as predictors of implementation levels: The diffusion of a nation wide health education campaign. *Health Education Quarterly*, *21*(4), 433-445. https://doi.org/10.1177/109019819402100406

Gorham, U., & Bertot, J. C. (2018). Social innovation in public libraries: Solving community challenges. *The Library Quarterly*, *88*(3), 203-207. https://doi.org/10.1086/697701

Goytia, E. J., Rapkin, B., Weiss, E. S., Golub, D., Guzman, V., & O'connor, M. (2005). Readiness and capacity of librarians in public libraries to implement a breast cancer outreach and screening campaign in medically underserved communities. *Cancer Control*, *12*(4), 13-20. https://doi.org/10.1177/1073274805012004S03

Guest, G., Namey, E. E., & Mitchell, M. L. (2013). Participant observation. In G. Guest, E. E. Namey, & M. L. Mitchell (Authors), *Collecting qualitative data: A field manual for applied research* (pp. 75-112). SAGE.

Hartzler, B. (2015). Building a bonfire that remains stoked: Sustainment of a contingency management intervention developed through collaborative design. *Substance Abuse Treatment, Prevention, and Policy*, *10*(1). https://doi.org/10.1186/s13011-015-0027-0

A History of US public libraries. (n.d.). Digital Public Library of America. Retrieved September 3, 2020, from https://dp.la/exhibitions/history-us-public-libraries/segregated-libraries

Hoenke, J. (2021, April). A day in the life: Queen of makerspaces. *Information Today*, *38*(3), 4-5.

Horrigan, J. B. (2016, September 9). *Libraries 2016*. Pew Research Center. https://www.pewresearch.org/internet/2016/09/09/libraries-2016/

How Americans value public libraries in their communities. (2013, December 11). Pew Research Center. https://www.pewresearch.org/internet/2013/12/11/libraries-in-communities/

Howard, J. (2019, November). The complicated role of the modern public library. *Humanities*. https://www.neh.gov/article/complicated-role-modern-public-library

Huang, L.-Y., & Hsieh, Y.-J. (2012). Consumer electronics acceptance based on innovation attributes and switching costs: The case of e-book readers. *Electronic Commerce Research and Applications*, *11*(3), 218-228. https://doi.org/10.1016/j.elerap.2011.12.005

Huwe, T. K. (2020, March). Building digital libraries. *Information Today*, *37*(2), 9-11.

Johnson, C. A. (2012). How do public libraries create social capital? An analysis of interactions between library staff and patrons. *Library & Information Science Research*, *34*(1), 52-62. https://doi.org/10.1016/j.lisr.2011.07.009

Johnson, S. C. (2019). MSW interns and public libraries: Enhancing services through interdisciplinary collaboration. *Public Services Quarterly*, *15*(1), 13-23. https://doi.org/10.1080/15228959.2018.1541332

Joplin, J. (2020, April 24). *Libraries are helping bridge the digital divide during COVID-19*. Google Fiber. https://fiber.google.com/blog/2020/libraries-are-helping-bridge-the-digital-divide-during-covid-19/

Judd, C. M., Smith, E. R., & Kidder, L. H. (1991). *Research methods in social relations* (6th ed.). Holt, Rinehart and Winston.

Kachel, D. E., & Lance, K. C. (2021). The status of state support of school library programs. *Teacher Librarian*, *48*(5), 8-13.

Katz, E., & Lazarsfeld, P. F. (2017). *Personal influence: The part played by people in the flow of mass communications* (2nd ed.). Routledge.

Kimball, S. (2020, April 14). *Library parking lots become WiFi hotspots in response to COVID-19 closures*. WhoFi. https://whofi.com/blog/analytics/library-parking-lots-become-wifi-hotspots-in-response-to-covid-19-closures/#:~:text=They're%20transforming%20parking%20lots,connect%20to%20online%20learning%20portals.

Kirchner, L. (2020, June 25). *Millions of Americans depend on libraries for internet; Now they're closed*. The Markup. https://themarkup.org/coronavirus/2020/06/25/millions-of-americans-depend-on-libraries-for-internet-now-theyre-closed

Kreps, G. L. (2005). Disseminating relevant health information to underserved audiences: Implication of the digital divide. *Journal of the Medical Library Association*, *93*(4), S68-S73. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1255755/

Lin, H.-F. (2011). An empirical investigation of mobile banking adoption: The effect of innovation attributes and knowledge-based trust. *International Journal of Information Management*, *31*(3), 252-260. https://doi.org/10.1016/j.ijinfomgt.2010.07.006

Makse, T., & Volden, C. (2011). The Role of Policy Attributes in the Diffusion of Innovations. *The Journal of Politics*, *73*(1), 108-124. https://doi.org/10.1017/s0022381610000903

Malachowski, M. (2014). Public libraries participating in community health initiatives. *Journal of Hospital Librarianship*, *14*(3), 295-302. https://doi.org/10.1080/15323269.2014.924754

Maxwell, J. A. (2013). *Qualitative research design: An interactive approach* (3rd ed.). SAGE.

McDonald, H. (2020, March 25). *More than books: How Pa.'s libraries are connecting with communities during coronavirus shutdowns*. Pennsylvania Capital Star. https://www.penncapital-star.com/covid-19/more-than-books-how-pa-s-libraries-are-connecting-with-communities-during-coronavirus-shutdowns/

McKenzie, P. J. (2003). A model of information practices in accounts of everyday-life information seeking. *Journal of Documentation*, *59*(1), 19-40. https://doi.org/10.1108/00220410310457993

Moore, G. C., & Benbasat, I. (1991). Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation. *Information Systems Research*, *2*(3), 192-222. https://doi.org/10.1287/isre.2.3.192

Moorefield-Lang, H. (2019). Lessons learned: Intentional implementation of second makerspaces. *Reference Services Review*, *47*(1), 37-47. https://doi.org/10.1108/rsr-07-2018-0058

Morgan, A. U., Dupuis, R., D'Alonzo, B., Johnson, A., Graves, A., Brooks, K. L., McClintock, A., Klusaritz, H., Bogner, H., Long, J. A., Grande, D., & Cannuscio, C. C. (2016). Beyond books: Public libraries as partners for population health. *Health Affairs*, *35*(11), 2030-2036. https://doi.org/10.1377/hlthaff.2016.0724

Musa, A. I., Ezra, G. S., & Monsurat, M. F. (2015). Perceived attributes of diffusion of innovation theory as a theoretical framework for understanding the non-use of digital library services. *Information and Knowledge Management*, *5*(9).

Neo, E., & Calvert, P. J. (2012). Facebook and the diffusion of innovation in New Zealand public libraries. *Journal of Librarianship and Information Science*, *44*(4), 227-237. https://doi.org/10.1177/0961000611435038

Nguyen, L. C. (2020). The impact of humanoid robots on Australian public libraries. *Journal of the Australian Library and Information Association*, *69*(2), 130-148. https://doi.org/10.1080/24750158.2020.1729515

Nikolopoulos, H., Farmer, A., Berry, T. R., Mccargar, L. J., & Mager, D. R. (2012). Perceptions of the characteristics of the Alberta nutrition guidelines for children and youth by child care providers may influence early adoption of nutrition guidelines in child care centres. *Maternal & Child Nutrition*, *11*(2), 271-282. https://doi.org/10.1111/j.1740-8709.2012.00460.x

Olin, A. (2019, December 5). *Public libraries are the crazy, radical ideas that might save society*. Rice Kinder Institute for Urban Research. https://kinder.rice.edu/urbanedge/2019/12/05/public-libraries-are-crazy-radical-ideas-might-save-society

Patton, M. Q. (2015). *Qualitative research & evaluation methods: Integrating theory and practice* (4th ed.). SAGE.

Perrin, A. (2021, June 3). *Mobile technology and home broadband 2021*. Pew Research Center. https://www.pewresearch.org/internet/2021/06/03/mobile-technology-and-home-broadband-2021/

Philbin, M. M., Parker, C. M., Flaherty, M. G., & Hirsch, J. S. (2019). Public libraries: A community-level resource to advance population health. *Journal of Community Health*, *44*, 192-199. https://doi.org/10.1007/s10900-018-0547-4

Pichman, B. (2019, November/December). Beyond makerspaces: How to create a solverspace. *Information Today*, *36*(9), 4-8.

Potnis, D. D., Winberry, J., & Finn, B. (2020). Best practices for managing innovations in public libraries in the USA. *Journal of Librarianship and Information Science*. https://doi.org/10.1177/0961000620948567

Potnis, D. D., Winberry, J., Finn, B., & Hunt, C. (2019). What is innovative to public libraries in the United States? A perspective of library administrators for classifying innovations. *Journal of Librarianship and Information Science*, *52*(3), 792-805. https://doi.org/10.1177/0961000619871991

Provence, M. A. (2020). Encouraging the humanization of patrons experiencing homelessness: A case study of the role of the US public library social worker. *The Library Quarterly*, *90*(4), 431-446. https://doi.org/10.1086/710258

Public Library Association. (2020, April 1). *Public libraries respond to COVID-19: Survey of response & activities results*. http://www.ala.org/pla/sites/ala.org.pla/files/content/advocacy/covid-19/PLA-Libraries-Respond-Survey_Aggregate-Results_FINAL2.pdf

Raynard, M. (2017). Understanding academic ebooks through the diffusion of innovations theory as a basis for developing effective marketing and educational strategies. *The Journal of Academic Librarianship*, *43*(1), 82-86. https://doi.org/10.1016/j.acalib.2016.08.011

Reid, I. (2017, December 4). The 2017 public library data service report: characteristics and trends. *Public Libraries Online*. http://publiclibrariesonline.org/2017/12/the-2017-public-library-data-service-report-characteristics-and-trends/

Rogers, E. M. (1995). *Diffusion of innovations* (4th ed.). Free Press.

Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). Free Press.

Rogers, E. M., Singhal, A., & Quinlin, M. M. (2019). Diffusion of innovations. In D. W. Stacks, M. B. Salwen, & K. C. Eichhorn (Authors), *An integrated approach to communication theory and research* (3rd ed., pp. 415-433). Routledge.

Saldaña, J. (2016). *The coding manual for qualitative researchers* (3rd ed.). SAGE.

Savolainen, R. (1995). Everyday life information seeking: Approaching information seeking in the context of "way of life." *Library & Information Science Research*, *17*(3), 259-294. https://doi.org/10.1016/0740-8188(95)90048-9

Savolainen, R. (2017). Everyday life information seeking. In J. D. McDonald & M. Levine-Clark (Eds.), *Encyclopedia of library and information sciences* (4th ed., pp. 1506-1515). Taylor & Francis.

Shivaram, D. (2021, April 15). *New York Public Library makes banned books available for free*. National Public Radio. https://www.npr.org/2022/04/15/1093095474/new-york-public-library-makes-banned-books-available-for-free

Sikes, S. (2019). Rural public library outreach services and elder users: A case study of the Washington County (VA) public library. *Public Library Quarterly*, *39*(4), 363-388. https://doi.org/10.1080/01616846.2019.1659070

Stake, R. E. (1995). *The art of case study research*. Sage.

Stevenson, S. A., & Domsy, C. (2016). Redeploying public librarians to the front-lines: Prioritizing digital inclusion. *Library Review*, *65*(6/7), 370-385. https://doi.org/10.1108/LR-02-2016-0015

Sundstrom, B. (2014). Breaking women's health taboos. *Social Marketing Quarterly*, *20*(2), 87-102. https://doi.org/10.1177/1524500414525774

Swenson, A. (2019, August 9). *Librarians facing new tasks say crisis isn't in the catalog*. AP. https://apnews.com/article/nyc-wire-health-us-news-opioids-libraries-ae0e76071cbc49bd844163bf7617cc8a

Tornatzky, L. G., & Klein, K. J. (1982). Innovation characteristics and innovation adoption-implementation: A meta-analysis of findings. *IEEE Transactions on Engineering Management*, *29*(1), 28-45. https://doi.org/10.1109/TEM.1982.6447463

Valier, F. M., McCarthy, R. W., & Aronson, J. E. (2008). A primary study of innovations during the prediffusion stage. *Journal of International Technology and Information Management*, *17*(3), 219-234.

Vardell, E., & Wang, T. (2020). Public librarians connecting communities to health insurance information. *Public Library Quarterly*, 1-28. https://doi.org/10.1080/01616846.2020.1844535

Vårheim, A., Skare, R., & Lenstra, N. (2019). Examining libraries as public sphere institutions: Mapping questions, methods, theories, findings, and research gaps. *Library & Information Science Research*, *41*(2), 93-101. https://doi.org/10.1016/j.lisr.2019.04.001

Velez, L., Lyons, P., & Chow, A. S. (2020). It starts by asking the right questions: Meeting the needs of the Hispanic community in public libraries. *Public Library Quarterly*, 1-21. https://doi.org/10.1080/01616846.2020.1847631

Vogels, E. A., Perrin, A., Rainie, L., & Anderson, M. (2020, April 30). *53% of Americans say the internet has been essential during the COVID-19 outbreak*. Pew Research Center. https://www.pewresearch.org/internet/2020/04/30/53-of-americans-say-the-internet-has-been-essential-during-the-covid-19-outbreak/

Wahler, E. A., Provence, M. A., Helling, J., & Williams, M. A. (2019). The changing role of libraries: How social workers can help. *Families in Society: The Journal of Contemporary Social Services*, *101*(1), 34-43. https://doi.org/10.1177/1044389419850707

Williams, M. L., Dhoest, A., & Saunderson, I. (2019). Social media, diffusion of innovations, morale and digital inequality. *Library Hi Tech*, *37*(3), 480-495. https://doi.org/10.1108/LHT-12-2018-0192

Wojciechowska, M., & Topolska, K. (2021). Social and cultural capital in public libraries and its impact on the organization of new forms of services and implementation of social projects. *Journal of Library Administration*, *61*(6), 627-643. https://doi.org/10.1080/01930826.2021.1947053

Wyatt, N. (2021, January 25). Outreach during the pandemic. *Library Journal*. https://www.libraryjournal.com/?detailStory=Outreach-during-the-Pandemic-ALA-Midwinter-2021

Yarrow, A., & McAllister, S. (2018). Trends in mobile and outreach services. *Public Library Quarterly*, *37*(2), 195-208. https://doi.org/10.1080/01616846.2018.1436365

Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). SAGE.

Zalusky, S. (Ed.). (2020, April). *The state of America's libraries 2020: A report from the American Library Association.* American Library Association. http://www.ala.org/news/state-americas-libraries-report-2020

Zalusky, S. (2021, April). *State of America's libraries 2021 special report: Covid-19*. American Library Association. https://www.ala.org/news/state-americas-libraries-report-2021

Zbiejczuk Suchá, L., Bartošová, E., Novotný, R., Bělehradová Svitáková, J., Štefek, T., & Víchová, E. (2021). Stimulators and barriers towards social innovations in public libraries: Qualitative research study. *Library & Information Science Research*, *43*(1). https://doi.org/10.1016/j.lisr.2020.101068

APPENDIX A

INFORMATION SESSION HANDOUT

DIFFUSION OF INNOVATIONS THEORY

- Seeks to explore why, how and the rate at which new ideas or products spread through society
- Diffusion is the process of the innovation being communicated to society over time
- Five factors impact the rate of adoption: perceived attributes, type of innovation-decision, communication channels, nature of social system, and change agents promotion efforts
- Perceived attributes of an innovation include relative advantage, compatibility, complexity, trialability, and observability
- Public libraries and their resources and programs serve their communities, which can be made up of a wide range of potential adopters (in various categories)
- Using an already developed and available innovation, we will create an outreach plan together that highlight some of the innovation attributes:
- communication channels
- change agents' (library's) promotion efforts
- relative advantage (improvement over current or previous offering)
- compatibility (does it fit easily into user's lifestyle)
- complexity (how complicated is it to use)
- trialability (easy, low stakes, exploration without commitment)
- observability (results or benefits are visible to other users)

ROGER'S DIFFUSION OF INNOVATION THEORY AT WORK IN A PUBLIC LIBRARY SETTING

APPENDIX B

HOTSPOT ADVERTISEMENT

HOTSPOT PARKING LOTS

Free wifi in parking lots throughout our community

Currently available at:
Bergstrasse Evangelical Lutheran Church
9 Hahnstown Rd., Ephrata

Holy Trinity Lutheran Church
167 E. Main St., Ephrata

Hope United Methodist Church
3474 Rothsville Rd., Ephrata

APPENDIX C

INFORMATIONAL INTERVIEW PROTOCOL

Warm up questions

What are some of the public library's new offerings? Programs, resources, etc.?
- Where did the ideas for these innovations come from?
- Do you ever try to target specific patron groups or community needs?
- How do you learn about those community needs?

What silver linings have come from necessary shifts due to the pandemic?
- What did you and your staff learn from those shifts?

RQ 1: How do public library staff develop a diffusion plan to implement parking lot Wi-Fi hotspots using DOI theory?

How do public library staff create innovations or new programs?
- Are there specific staff assigned to these duties?

How do outreach staff promote new programs, initiatives, offerings?
- What types of communication channels do you use?
- How do you decide which/how many communication channels to use?

How have your communication/promotional tactics changed since the pandemic?

RQ 2: How do public library staff address stimulators when developing a diffusion plan to implement parking lot Wi-Fi hotspots using DOI theory?
RQ 3: How do public library staff address barriers when developing a diffusion plan to implement parking lot Wi-Fi hotspots using DOI theory?

What factors does the public library take into consideration when creating new programs or resources?
What factors do you wish the public library could take into account when creating new programs or resources?
What factors does the public library take into consideration when communicating about new programs or resources?
What factors do you wish the public library would take into consideration when communicating about new programs or resources?

APPENDIX D

HALFWAY INDIVIDUAL INTERVIEW PROTOCOL

What has been confusing so far?

What have you found helpful so far?

What would the ideal sign look like for parking lot Wi-Fi hotspots?

Do you feel like these topic specific exercises are fruitful? Why?

Can you see this type of development pattern be applied to other initiatives?

Is there something you would like to share here that you didn't get to in a group meeting (for whatever reason)?

APPENDIX E

FINAL INDIVIDUAL INTERVIEW PROTOCOL

Go over Diffusion Plan

What are your thoughts?

What is missing?

If you were director of the library, what concerns might you have when it comes to implementing this?

How can we make sure this works?

APPENDIX F

FINAL FOCUS GROUP AGENDA

In attendance: Kayla, Halee, LeAnne, Mya, Linda., Tori, Eliana

Welcome

Overview of work

- Introduction to Diffusion of Innovation Theory
- 4 sessions of discussion, focusing on components of DOI and their application to EPL and public Wi-Fi
- Two sets of individual interviews
- Culminated into this diffusion plan, specific to public Wi-Fi offered by EPL and available throughout the community
- A templated plan was also cultivated from this work to be used for other initiatives

Benefits

- Staff seemed to benefit from focused and consistent discussion
- Allowed staff to learn about other programs, initiatives other programs
- Allowed staff to view systemic procedures and protocols that could be updated or improved (communication, planning, etc.)

Detriments

- Time intensive, especially the first go around to learn components of DOI

The plan

- Knowing this initiative is already in place, through the discussion, questions arose about the functionality which lead to the discovery of some of the flaws of public Wi-Fi
    - Not always on/working/available

- Bandwidth limitations
- Unclear instructions on sign (to sign on and/or where to park and/or the knowledge of the offering)
- Unclear Host/Partner responsibilities
- Unclear EPL responsibilities

- The plan addresses some of these flaws and offers solutions
- The plan provides an opportunity to "start over"
- The plan is not fixed and can/should be edited through the implementation process

Go over plan

Open to discussion

- Is this implementable? On what type of timeline?
- What are some of the edits we can/should make now?
- Homeschool--scrawls
- Whistlestop as other location/host (public plaza)
- Grater Park (pool + Eicher + EPAC)
- Promote with summer reading or back to school
- Make this a priority
- Won't be the programming team, will be Eliana, LeAnne, Kayla, Megan, Alice, Linda

Next steps:

-Sloane makes a list of tasks; LeAnne assigns who and timeline

-Tasks include procedures, new sites to reach out to

APPENDIX G

DIFFUSION PLAN TEMPLATE

Preparation: *Name all necessary decision makers and implementers, invite them to the table*

-Discuss the WHY of the innovation
-Discuss WHO is the target audience
-Keeping the WHY and the WHO in mind, list possible community partners
-Draft a list of terms and definitions
-Draft procedure(s)
-Assign roles and responsibilities

Diffusion Plan: Promotional efforts via mass media and word of mouth

-All efforts should use similar language and design in addition to the *relative advantages* of the innovation

-All efforts should state clear expectations to ensure the *compatibility* and low level of *complexity* of the innovation

-Library staff must trial and use innovation to speak from experience to promote *trialability* and *observability*

-Library staff must check in on innovation and *observe* use on a regular basis

-Promotional efforts should include video tutorials to enhance *observability* in a universal manner

-Programs for audiences should include “field trip” opportunities to promote *trialability* and *observability*

APPENDIX H

IMPLEMENTATION PLAN

-Create a list of terms and definitions related to Parking Lot Wi-Fi to include with every advertisement, post, etc.

-Draft procedure(s) for Parking Lot Wi-Fi hosts

-Reach out to other potential community partners and potential new sites for Wi-Fi

-Design “story walk” on walking trail to show how to connect, contact press

-Design login pages to look identical to Wi-Fi login page at EPL

-Add locations to Wi-Fi access page on EPL’s website

-Add FAQ page to website and update as patrons ask repeat questions

-Reach out to new borough manager and library board members for support, include data on numbers of community members experiencing homelessness

-Design promotional material to include advantages of Wi-Fi (various locations, quiet, 24/7, free/no purchase, no library card), locations & promote where target audience is most likely to see multiple times and phrases like “extension of Ephrata Public Library”

-Design flyers specific to homeschool groups

-Design flyers specific for summer reading program participants

- “shareable” promotional material to increase word of mouth communication

-Create video tutorials that include someone getting to a host location, parking in the correct spot, correcting logging on, and browsing the internet

-Schedule time for staff to trial Wi-Fi to speak from experience

-Hold “field trip” programs for patrons to have assistance logging on

-Write more hotspots into collection budget

VITA

Samantha Laine Hull
Department of STEM & Professional Studies
Old Dominion University, Norfolk. VA

EDUCATIONAL BACKGROUND

- **Ph.D. in Instructional Design & Technology,** Old Dominion University, degree expected Summer 2022
- **Master of Science in Library Science,** Clarion University of Pennsylvania, Clarion, PA, 2014
- **Bachelor of Arts in English**, Lebanon Valley College, Annville, PA, 2010

LICENSURE

- **English Teacher 7-12,** Pennsylvania Department of Education
- **Library Media Specialist K-12,** Pennsylvania Department of Education
- **Supervisor Certificate: Curriculum & Instruction,** Pennsylvania Department of Education
- **Professional Librarian,** Pennsylvania Department of Education

PUBLICATIONS

- Bates, J., Fuhrman, C., Kern, E., Mackley, A., Pannebaker, S., Burrell, P., Perkins, R., Shenefiel, B., Tiger, B., Brackbill, D., Gustafson, K., Hall, C., Ward, L., Farrell, J., Hull, S., Lynch, D., Biagini, M., Boyer, B., Emerson, A., Kachel, D., Stolarski, E., Yutzey, S., Ziegenfuss, R., Zimmerman, K., Weiss, J. (2019). Guidelines for Pennsylvania school library programs. Harrisburg: Pennsylvania Department of Education

PROFESSIONAL EXPERIENCE

- Librarian, Ephrata Area School District, Ephrata, PA, 2014 to present
- Circulation Assistant, Ephrata Public Library, 2012 to present
- Teacher, Eastern Lebanon County School District, Myerstown, PA, 2012 to 2014

MEDIA & GOVERNMENT INTERACTIONS

- *Free Speech Under Attack: Book Bans and Academic Censorship: Hearings before the Civil Rights and Civil Liberties*, 117th Cong. (2022) (testimony of Samantha Hull).
- Lockwood, D. (2022, June 21). Forbidden words. *The Philadelphia Inquirer*.
- Natanson, H. (2022, March 22). Schools nationwide are quietly removing books from their libraries. *Washington Post*.

HONORS

- 2021 Ephrata Area Education Foundation Venture Grant Recipient: Applicable Escapes

- 2020 Leadership Institute for School Librarians Graduate, Pennsylvania School Librarians Association
- 2019 Ephrata Area Education Foundation Venture Grant Recipient: Virtual Reality Goggles
- 2017 Library Services and Technology Act Professional Development Grant Recipient
- 2017 Ephrata Area Education Foundation Venture Grant Recipient: A. S. King Author Visit
- 2017 Regional Leaders Academy for PA School Graduate, Pennsylvania School Librarians Association
- 2017 American Library Association Emerging Leader
- 2016 Elevating and Celebrating Effective Teaching and Teachers (ECET2) Conference Attendee via nomination
- 2015 Academy of Leadership Studies (PALS) Graduate, Pennsylvania Library Association
- 2015 Ephrata Area Education Foundation Venture Grant Recipient: Tiffany Schmidt Author Visit
- 2013 Professional Development Travel Scholarship: Peru, Education First

SERVICE ACTIVITIES

- Hosting Solutions and Library Consulting Board Member (2022-Present)
- Library of Congress Books That Shaped Me Contest Judge (2017)
- American Association for School Librarians Innovative Reading Grant Committee Chair (2018)
- Lancaster County Library Association Secretary (2015-2017)
- Pennsylvania School Librarian Association Regional Coordinator (2015-2018)
- Pennsylvania School Librarian Association Board Director (2020-Present)
- Intermediate Unit 13 Librarians' Collaborative Co-chair (2020-2022)
- Scholastic Writing Contest Judge (2012-2016)