A PHENOMENOLOGICAL STUDY OF INDIVIDUAL STRATEGIES FOR MARKETING STEM TO 4-H AUDIENCES AS TOLD THROUGH THE LIVED EXPERIENCES OF 4-H STATE STEM SPECIALISTS

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Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
MASTER OF SCIENCE
May, 2019

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Major Field: AGRICULTURAL EDUCATION

Abstract: The 4-H organization is striving to ensure that more youth receive science, technology, engineering, and math (STEM) educational programming in order to provide 4-H youth with the knowledge and skills to advance in a STEM workforce. To ensure more youth are impacted by STEM programming proper marketing strategies must be employed. A phenomenological research design was used to capture the marketing strategies of 4-H State STEM Specialists which are currently being used. Through in-depth interviews with 4-H State STEM Specialist throughout various regions of the United States. This research study illustrates how 4-H State Specialist within the 4-H organization are marketing their STEM programming. The findings suggest a lack of marketing strategies to market STEM programs. Strategies relied on by 4-H State STEM Specialist are developing and building relationships, directly reaching audiences, eliminating fear from gatekeepers, making curriculum, fun, unique, or creative, and considering potential missed markets.

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CHAPTER I

INTRODUCTION

Background

It is projected that future careers will require a higher degree of content knowledge in the areas of science, technology, engineering, and mathematics (STEM) (SFAC, 2014). To meet this need, an increasing number of STEM educational programming has formed in the U.S. throughout K-12 (Dugger, 2010). Supported by educators and the United States (U.S.) legislators have pushed for the significant expansion of STEM integration within the classroom and out of school time programs (OTS) (Bequette & Bequette, 2012). Integrated STEM curriculum engages youth to learn subjects fluidly, allowing students the opportunity to understand and apply content knowledge in their daily lives, when compared to traditional learning environments in which learning occurs in fragmented pieces (Dugger, 2010).

STEM

According to Dugger (2010), a popular buzzword with parents is the STEM acronym; a large proportion of parents agree that future careers will demand higher STEM skills. Surveys indicate that parents favor curriculum enhancing STEM education and hands-on learning (Simmons, 2017). The development of STEM skills will only be increased through the expansion

of quality and quantity STEM curriculum (Marginson, Tytler, Freeman, & Roberts, 2013). Marginson et al. (2013), found a general decline of students enrolled in STEM disciplines in English-speaking countries, excluding Canada, have reported a "STEM crisis" (p. 55). This decline represents ineffective programs and their inability to foster positive experiences and influence youth, ultimately hindering youth's performance in STEM education (Xue & Larson, 2015). Dugger (2010) reports more than 90 percent of all scientists and engineers live in Asia, to assist the U.S. in producing an increased number of domestic scientists an emphasis is placed on STEM education and programs.

Higher education and leaders in the U.S. STEM industry have expressed a rising concern that STEM education is inadequate when compared to international educational programs (Xue & Larson, 2015). STEM education was intended to support and advance students in their future workplace by developing STEM programs. STEM education programs are meant to lay the groundwork for students entering high-tech work environments (Bequette & Bequette, 2012).

4-H STEM Programs

According to Hendrix and Williamson (2017), U.S. workforces have faced shortages of qualified professionals in STEM-related fields and is currently being addressed through Extension programming. The 4-H provide hands-on and experiential experiment for students to engage in STEM learning, the 4-H Science Initiative has increased science literacy and the number of youths pursuing STEM careers (Mielke, Lafleur & Sanzone, 2010). A national 4-H science mission mandate expands programming and opportunities for youth to feel a sense of mastery and increasing youth's self-efficacy (4-H Science Program Design, 2013). Self-efficacy is the perceived capability of an induvial when performing tasks to achieve their goals (Ashford, Edmunds, & French, 2010). Self-efficacy is believed to impact individual choices and the level of

task performance (Ashford et al., 2010). Cooperative Extension and 4-H have undertaken this challenge by offering STEM workshops and programming (Hendrix et al., 2017).

The 4-H organization provides youth the opportunities to experience new skills among peers by encouraging youth to learn through inquiry-based project learning (Sallee et al., 2014). Projects connect science skills through practical applications with hands-on projects completed with an adult or parent; youth can participate in the following project areas science, agriculture, healthy living, and citizenship (4-H, 2016). Not only is 4-H available to youth in every county or parish in the U.S., but also it is offered through in-school programs, after-school programs, clubs, or camps (Simmons, 2017). With a lack of a cohesive marketing plan, STEM programs within the 4-H organization have not established effective channels of communication, including techniques and strategies to assist in the planning, implementing, and evaluating programs (Whitaker, Leggette, Barbeau, 2018). Telg, Iranim Hurst and Kistler (2007) states, "Extension agents would benefit from the development of marketing and promotional tools that would help them to disseminate information to the public," and "maintain their presence" as an information source ("Introduction" para. 1).

Statement of the Problem

There are few examples of Extension professionals successfully incorporating applied marketing tactics into their programs (Chappell, 1994). It is noted, Extension professionals are pre-occupied with program development and clients to focus on a marketing plan (Chappell, 1994). While the 4-H organizations marketing budgets will never be substantial, the lack of marketing communications have ultimately hindered 4-H STEM programming (Maddy & Kealy, 1998).

According to Locklear (2013), Americans do not understand enough about STEM to advance in their current society, as reflected in the outsourcing of domestic STEM jobs to foreign

markets. Due to a shortage of science and engineering careers in the U.S., 4-H has increased STEM programming to enhance STEM curricula, which intends to create opportunities for youth to discover and explore STEM content areas (Sallee et al., 2014). However, minimal curriculum exists for programs within 4-H (Simmons, 2017). Higher exposure to STEM education can lead to:

> STEM literacy is increased when youth participate in 4-H STEM programs. Sources for STEM self-efficacy, STEM abilities, and STEM literacy are introduced through activities that focus on real-world issues, follow the engineering design process, engage youth in hands-on inquiry and open-ended questioning, opportunities to learn to work as a productive team, apply rigorous math and science content, and allow for numerous correct responses and reframe failure as a necessary part of learning. (Jolly, 2014, p. 1)

Significance of the Study

An in-depth marketing analysis becomes critical to determine youth and educators' preferences to specific programs and curriculum (Higgins, Chazdon, Hansen, 2015). 4-H Youth Development programs can utilize information collected to determine methods of marketing STEM. This study can provide a strategy of marketing STEM programming to 4-H educators, leaders, volunteers, and teen leaders; while facilitating the distribution of accessible information regarding the marketing strategies of STEM. This study identifies new markets and tactics when promoting STEM curriculum. The ultimate goal of this research is to ensure more youth are impacted by STEM programming through marketing efforts.

Purpose of the Research

The research design for this study is qualitative, a common practice for evaluating Extension programs (Guion, Diehl, & McDonald, 2011). 4-H practitioners, decision makers, and evaluators can read emerging themes provided by participants to decide if these tactics could improve their

4-H STEM programs. As the decision makers and gatekeepers within their respected state, these 4-H STEM Specialists shared their experiences of marketing STEM programs. Gatekeepers within the 4-H organization, are typically identified as those who are willing to send information to specific audiences (Tyson, 2014).

The purpose of this study is to understand the experiences of 4-H STEM State Specialists when marketing STEM programming. An Extension State Specialist is responsible for conducting trainings and providing educational support materials for field staff, youth, and volunteers (Wise, 2019). A 4-H STEM State Specialist should provide educational leadership through the development, management, implementation, and evaluation of programs (Wise, 2019).

This study allows the reader to gain knowledge and insight of 4-H State STEM Specialists perceptions, the significance of their experiences, what influences their future decisions, and what methods are currently used regarding marketing STEM. Phenomenology research design allowed me to gain insight and understanding of the shared lived experiences faced when marketing 4-H STEM programming through the lens provided by the participants. Ultimately, the results of this study determine strategies of marketing STEM within the 4-H organization. By directly interviewing those involved with marketing STEM in 4-H, this study answers the central research questions. Creswell (2007), recommends asking questions beginning with how and what. The central research question was "*What are your strategies for marketing STEM to 4-H audiences?*"

Assumptions

Assumptions of the study are as follows

1. Participants knew marketing tactics of STEM within their particular state.
2. Participants recognized the challenges of marketing STEM within their specific region.

3. Participants had a fluent understanding of the topics discussed.
4. Participants understood the strategies used by educators, agents, and leaders when marketing STEM programs.
5. Participants answered questions honestly and to the best of their abilities.

Limitations

This study is limited to the experiences of those in 4-H STEM State Specialist positions and this study is only applicable to 4-H programs. The limitations of this study are as follows:

1. Sampling procedures utilized in qualitative research does not exhibit application further than the realm of the actual participants' lives, specific industry, and population.
2. Participants' opinions about what strategies are effective for marketing STEM.
3. Marketing techniques will be limited to the participants' lived experiences.
4. Recorded transcripts will be used for review and analysis and will be incapable of reproducing non-verbal movements.
5. Participants might not reveal their honest views and attitudes during the interview. I built the study on the honesty and reliability of the participants.
6. Issues reported may only pertain to participants setting, conditions, and programs.
7. Observations were recorded and transcribed by one researcher and documented in their point of view.

CHAPTER II

LITERATURE REVIEW

Introduction

The purpose of this literature review is to add an understanding and comparison of previous works, provide the reader with background information on the phenomenon, and add further understanding of the environments in which the participants are engaged. A literature review is crucial before initiating academic research; it is the process of analytically discovering and reporting prior research (Webster & Watson, 2002).

In a phenomenological study, the review of literature must increase the readers understanding of a phenomenon and communicate discoveries within the area of research (Kafle, 2011). This literature review outlines significant information and history to provide the reader with the environment and landscape of 4-H, STEM, and marketing to creating a dialogue of understanding of the participants' lives (Dostal, 1987). Understanding the current body of knowledge (BoK) is the first step to any research project (Levy & Ellis, 2006). A literature review builds the background and theoretical foundation of the research (Levy & Ellis, 2006).

A useful qualitative literature review will (1) methodologically disperse literature, (2) lay the foundation of the research topic, (3) provide the research design, and (4) will show the impact

and contribute to the knowledge base (Webster et al., 2002). I read comprehended, synthesized, and evaluated peer-reviewed literature (Webster et al., 2002). A concept-centric approach allows me to complete a review of literature based on relevant content to the phenomenon (Rowe, 2014).

Origins of STEM Education

The literature revealed a pivotal time for STEM originated during the space race, America's longstanding history with STEM began with the launch of the Soviet Satellite Sputnik in 1957, signifying the U.S. educational system was not competing with foreign educational systems (Jolly, 2009). With ongoing criticism of the U.S. school system, the launch of Sputnik led to unprecedented funding from the federal government (Gonzalez & Kuenzi, 2012).

Results of this additional funding provided the resources and increased the number of well-trained STEM professionals to higher education and the workforce (Thomas & Williams, 2009). These initiatives were supported by the National Defense Education Act (NDEA) and were put in place to strengthen America's educational system (Gonzalez et al., 2012). The NDEA has recommended increasing student's exposure to a rigorous science and math curriculum, to in turn increase the number of American scientist and researchers (Jolly, 2009).

Evolving from government policy, initially STEM used as the acronym SMET or science, math, engineering, and technology (Breiener, Harkness, Johnson, & Koehler, 2012). However, due to the vulgarity of SMET and urban slang, it was later changed to STEM, the acronym has now been adopted at national, state, local levels, and within scientific communities in the U.S (Breiner et al., 2012).

Importance of STEM

The current economic marketplace of the U.S. is solely dependent on the ability to educate and employ a highly trained worker to replace retiring baby boomers (Dickman,

Schwabe, Schmidt & Henken, 2009). Regrettably, a STEM industry consensus has recently experienced employees who are not prepared nor educated to enter the workplace (Cannady, Greenwald, & Harris, 2014). Fayer, Lacey, and Watson (2017) report STEM careers are predicted to be in high demand and higher paying positions when compared to non-STEM occupations.

Teachers should educate students with the intention's students will make future scientific advancements which will positively benefit our society (Cannady et al., 2014). Filling STEM positions relies on an educator's capacity to prepare the next generation for the workforce which is currently in school receiving their education and preparing for their careers (Dickman et al., 2009).

According to Metcalf (2014), today's youths are reported to be lacking in skills within the STEM pillars or content areas. Research has projected a deficit of qualified workers is holding the necessary educational credentials to fill these positions (National Academies of Sciences, Engineering, & Medicine, 2017). Future STEM careers will be divided into two categories those who will (a) require an advanced degree and (b) require middle skills which are attainable for high school graduates with proper training and certification (Dickman et al., 2009).

Currently, STEM careers fields are the fastest growing job market in the U.S. (Metcalf, 2014). The lack of STEM programming has caused the displacement of STEM careers being taken from the U.S. and reassigned to foreign markets such as manufacturing, financing, engineering, and research jobs (Augustine, 2005). If the U.S. is to prepare a STEM-literate employee, an increased number of youth participation in STEM educational courses and programs is required (Asunda, Kim & Westberry, 2015).

Common Trends Within STEM

America's rising concern with its current global educational position has contributed to a renewed importance placed on stronger STEM educational programming (Asunda et al., 2015).

Augustine (2005) stated, in recent history STEM education has gained momentum and appeared at the forefront of the legislative discussion to positioning the U.S. at the forefront of global education. The enhancement of STEM educational programs alike was referred to as the "Race to the Top" by the Obama-Biden plan (2009) and allocated 4.3 billion dollars to improve the current educational systems and programming (Breiner et al., 2012). Policymakers advocated for an increased number of Out-of-School-Time programs (OST) (Cohen, 2018). Congressional concern began to arise around topics like STEM education in 2007 when the National Academies published *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future*. This publication reported STEM education as a perceived weakness of the U.S. educational system and threatened national prosperity (Gonzales et al., 2012).

Integrated STEM Models

Incorporation of an integrated STEM curriculum models has been recommended for middle schools (Stholmann, Moore, McClelland & Roehrig, 2011). Integrated STEM models link multidisciplinary subjects' together (English, 2017). STEM programs are recognized as playing a vital role in filling STEM careers with qualified workers (Stholmann et al., 2011). The integration of STEM in the U.S. educational system is deemed essential in tackling societal problems of the future (English, 2017). Fully integrated STEM is frequently defined as, "more than the sum of its parts," (p.6) emphasizing on problem-solving, critical thinking, and content knowledge (Dickman et al., 2009). Comparatively, many STEM curricula are taught in stand-alone methods meaning science, technology, and math have little to no integration with each other (Blackley, Sheffield, Maynard, Koul & Walker, 2017).

In an integrated STEM environment, youth will experience a broad range of knowledge, ideas, and practices Mitchell, Wolfgram, Srisurichan, Walkington, and Albiali (2017) state, this requires learners participating in an integrated STEM program or activity to understand the

fluidness between each subject area. It is the fluidness between these subject-areas that mimic a real-life experience and how professionals work on a day-to-day basis (Blackley et al., 2017).

Contradictorily, integrated STEM program can disservice students who are not kinesthetic learners because this style of teaching relies heavily on with a hands-on approach (Fleder, 1988). Kinesthetic learning style is the process where students learn through actively performing activities rather than listening to lecture-based information (Sivilotti & Pike, 2007). Makerspaces used alongside integrated STEM education deliberately require students to merge STEM subject areas, challenging students to create products or artifacts (Sheridan, Halverson, Litts, Brahms, Jacobs-Priebe & Owens, 2014). Makerspaces are areas which offer laboratories for a self -directed inquiry-based learning (Educause Learning Initiative, 2013). Makerspaces and STEM programing engages youth in the engineering design process, reinforcing concepts of science and engineering (Guzey, Moore, Harwell, & Moreno, 2016).

Background of 4-H

The 4-H organization was developed in the late 1890s and early 1900s in response to public demand for better agricultural practices, the U.S. government ratified the Smith-Lever Act establishing the Cooperative Extension service through the land grant system (Borden, Perkins & Hawkey, 2014). The ratification of the Smith-Lever Act, allowed higher education through the land-grant university to become a public good for advancing the U.S. citizens (Augustine, 2005). With efforts from the land-grant university system, 4-H was an innovative outreach program (Borden et al., 2014). Established explicitly for adults and agricultural practitioners (Horn, Flanagan & Thomson, 1998) through a series of serendipitous discoveries, educators observed youth to be more responsive to new techniques, science, and research (Rasmussen, 1989; Reyburn, 1980). From humble rural beginnings, 4-H now reaches approximately six million youth contacts each year from rural and urban backgrounds (Borden et al., 2014). The drastic

population shift from rural to urban has generated a re-arrangement of the roles of the 4-H organization (Fritz, Karmazin, Barbuto, & Burrow, 2003).

4-H Projects and STEM

STEM has been at the foundation of the 4-H program since its beginning; today, 4-H has considerably shifted from teaching subjects such as canning and agriculture and has expanded to explore topics like computers science, coding, drones, DNA, and robotics (Kress, 2014). 4-H is attempting to bridge the gap in youth's participation in STEM projects (Heck, Carlos, Barnett & Smith, 2012). The 4-H organization has acknowledged the vital role STEM education plays in the nation's future, creating a national mission mandate striving to prepare youth for the challenges of the 21st century (Simmons, 2017). According to *Filling the STEM Pipeline* (2015), National 4-H has launched STEM programs encouraging youth to explore STEM-related fields. Contrary to belief, 4-H never stopped teaching STEM but renewed its emphasis has increased efforts to promote and STEM programming (Simmons, 2017).

Committed to advancing youth STEM education, the 4-H organization has begun to celebrate National Youth Science Day (NYSD) by creating a national 4-H curriculum pushing STEM programming (Borden et al., 2014). The 4-H organization has partnered with companies like US Cellular and Google, providing youth an opportunity to work with professionals within STEM fields (Simmons, 2017). Over the course of a year, leaders and associates from US Cellular worked with 4-Her's in youth-led STEM events. Forming a powerful intersection, these initiatives connect members of the STEM profession to local 4-H youth (Kress, 2014).

The adaptability of the 4-H programs is based on the needs of the U.S. people (Van Horn, Flanagan, & Thomson, 1998). For instance, popular 4-H projects during World War II was growing essential crops and meats for men and women serving in the war effort (Horn et al., 2014). Projects and demonstrations allowed youth to connect new practices and information

learned throughout their projects while contributing to the war effort (Hoover, Scholl, Dunigan & Mamontova, 2007). These early philosophies were developed with the expectation youth would share information learned from 4-H projects to educate their parents of new agricultural practices (Hoover et al., 2007). With the 21st-century demands for increased professionals in the STEM workforce, the 4-H organization implemented and integrated STEM programs and projects; projects allow youth to explore specific project areas and topics, that interest them (Sallee et al., 2014).

Throughout history, 4-H youth projects have been an exceedingly useful way to recruit youth to the 4-H organization programs and are currently still effective recruiting methods (Horn et al., 2014). Project-based learning allows 4-Her's opportunities to practice, learn, and apply new ideas and knowledge through a practical application (Sallee et al., 2014). The learning by doing model of 4-H provides students a relevant experience versus lecture-based materials received traditional educational settings; these experiences enhance and benefit youth learning while simultaneously creating an interest in STEM-related fields (Kress, 2014).

Declining Membership of 4-H

The declining membership of 4-H youth is not a new phenomenon according to Defore, Fuhrman, Peake, and Duncan (2011), and is not exclusive to the 4-H organization. The national percentage of 4-H members is on a steady decline from the years 1990-2014. Despite the decreasing membership, the 4-H organization can attract youth, however; 4-H significantly has difficulty holding the membership of youth as they enter high school, high-school-aged students are not opting to join 4-H programs (Connors, Moore, & Elliot, 1990). The membership decline within the 4-H organization has been linked to the traditional marketing efforts of 4-H programs through word-of-mouth between club leaders and youth peers (Wingenbach, Meighan, Lawrence, Gartin, & Woloshuk, 1999). Additionally, 4-H heavily relies on volunteers' abilities to create

clubs and program environments that are interesting, fun, and exciting as a recruitment tool for new members (Wingenback et al.,1999). To improve retention, leaders must make members feel welcome and recognized empowering youth and parents to engage with the club (Lewis, 2008).

Benefits of 4-H OST STEM Programs

Results from *4-H Participation and Science Interest in Youth* (2012) found, 4-H youth are not more interested in STEM, but have a higher likelihood of continuing their education and enrolling in higher level science courses as high-school students. According to Heck et al. (2012), in-depth STEM educational programs like 4-H have been linked to establishing an interest in STEM among youth and they are more likely to pursue a career or education in STEM.

Worker and Mahacek (2013) state, 4-H OST programs provide students an environment which is: fun, engaging, and relevant, creating a climate of advanced motivation for student learning. During OST, STEM educators can play a vital tool in addressing STEM education (Worker et al., 2013). Specifically, summer programs have been shown to significantly increase youth interest and motivations of STEM-related education and career fields (Greene, Lee, Constance & Hynes, 2013).

4-H programs which are heavy in camping project areas have incorporated STEM into the camp curriculum as an opportunity to teach STEM programming (Galloway, Bourdeau, Arnold, & Nott, 2014). Positive experiences during OST programs are associated with the higher likelihood of youth choosing STEM careers and secondary education (Dabney et al., 2012). Further explaining, OST youth participants are described as having higher work-ethic and peer interaction when compared to their peers who do not attend OST programs (Katoka & Vandell, 2013).

Kolb's Experiential Learning Theory Applied to 4-H

Several educational learning theories have been implemented throughout the 4-H organization and 4-H STEM programming (Meyers & Jones, 2015). The learning by doing motto of 4-H aligns closely with Kolb's experiential learning theory (ELT) (Kolb, 1984). Within Extension the phrase, experiential learning is a commonly used buzzword (Meyer et al., 2015). The foundation of ELT is derived from the conceptualization that knowledge is achieved through youths' experiences and active learning (Kolb, 1984). Kolb's ELT cycle may be paraphrased and interpreted in layman's terms as (a) active participation, (b) reflection of the experience, (c) evaluation of knowledge, (d) and formulation of solutions and attempting again (Kolb, 1984). Because the learning process is highly experiential; not every experience transfers knowledge (Dewey, 1938). Kolb's ELT model as interpreted using semantics or vocabulary commonly used throughout the 4-H organization: (a) learning by doing, (b) learning through hands-on experiments, (c) project work, and (d) problem-solving, aligning well with the principles project-based work.

The 4-H organization allows youth to complete hands-on projects to acquire learning (Torock, 2009). ELT is a theory embedded throughout 4-H with its unique position as being experiential, providing an effective method of content knowledge coupled with hands-on experiments (Torock, 2009). The 4-H organization allows 4-Her's to engage in learning without the conscious fear of being right, wrong, failing, or passing (Meyer et al., 2015).

ELT tends to be solely focused on activities, without the proper content-knowledge, paired activities are irrelevant; not all STEM experiences will lead to learning (Kotval, 2003). Educators must be purposeful with lesson planning and deliberately pair activities accordingly if youth are uninterested in topics or do not have previous experiences; this can hinder the learning process (Kotval, 2003).

Challenges of Building STEM Curriculum

Early adopters within educational fields are often looking for new materials and instruction methods (Smathers, Washburn, Toomey, Johannes, Iaccopucci & Johnston 2018). These new curricula and materials can produce a variety of problems including the risk of failing, because of the incompatibility of traditional teaching methods (Smather et al., 2018). The importance of the curriculum design process cannot be overlooked; an ill-designed curriculum can be the differences between positive or negative learning environments (Sandlin & Milam, 2008). To increase the success of curriculum, it should be piloted and provide hands-on training and professional development (Sandlin et al., 2008). A challenge of STEM curriculum design lies in effectively integrating each discipline (English, 2017).

An integrated STEM curriculum is not merely just the combination of two subject areas; preferably, it includes the specific intent of each subject area when teaching, context, and content are essential (Cullars, 2018). Because the term STEM is regarded as, "more than the sum of its parts" (p. 6). STEM educators must emphasize teaching without "labeling" specific subject-areas (Dickman et al., 2009).

Marketing and Digital Marketing

Marketing

According to Webster et al. (2002), a useful literature review identifies knowledge gaps and missing themes in research. No extensive literature has been found covering topics of marketing STEM education. I search the keywords, "promoting," "marketing," and "STEM" in the Journal of Extension, Google Scholar, and the Journal of Youth Development. This section is dedicated to marketing and new media environments for the reader to grasp the basic understanding of marketing and new media.

Marketing is the science of predicting a consumer's thoughts, perceptions, and responses to a new product or innovation (Hauser, Tellis, Griffin & 2006). When new or innovative products and ideas are created, marketing must follow (Harmon, 2003). Marketing strategies are continually changing with the rise of new technologies, consumer preferences, and the ever-changing landscape of digital media (Harmon, 2003).

Marketing plans serve as a road map to the marketing process; without these plans, strategies could potentially become ineffective (Chappell, 1994). The purpose of a market planning is to develop a cohesive approach to reaching an organization's goals and objectives (Chappell, 1994). Marketing does not just happen; it is a process; which should be planned, organized, and controlled (Nehiley, 2001). Marketing research should be used as a tool to identify key publics and practical outreach efforts (Larson, 1997). Marketing researchers must identify new techniques to address this problem by segmenting consumers into potential key publics or target audiences (Harmon, 2003).

Digital Marketing

Popular marketing mediums of the last century were television, radio, mail, or face-to-face communication; however, the rise of digital media has given more power to the people, revolutionizing the way consumers obtain and spread information (White Meyers, Doerfert & Irlbeck, 2014). Digital media platforms have the conceivable potential to reach millions of viewers Wickstrom and Specht (2016), explained social media networks could gain and influence followers through various platforms. Although nothing can replace face-to-face communication, social media platforms have adapted for the decreased emphasis on personal communication (Pritchett, Naile, Murphrey & Reeves, 2014).

Digital marketing reaches consumers with greater effectiveness, efficiency, depth, and speed (Harmon, 2003). The 4-H organization has utilized digital marketing to disseminate

research-based information, not only is online marketing seen as a necessity for organizations but also it remains pivotal to a successful marketing campaign (Kinsey, 2010). Digital media has allowed 4-H professionals the tools to reach a broader audience using web-based marketing (Kinsey, 2010).

The past several years has brought about various types of social networking to create an engaging two-way conversation (Bowen, Stehpens, Childers, Avery & Stripling, 2013). Throughout the past decade, 4-H professionals are faced with the challenge of adopting digital communication strategies such as social media (Bowen et al., 2013). Research has found Cooperative Extension has yet to find its role marketing in the digital world and is often defined as unpopular (Arnold, Hill, Bailey & Meyers, 2012). The lack of digital media raises concerns youth will not fully experience all of the benefits of 4-H programs (Arnold et al., 2012). Fuess and Humphreys (2011) said,

> As a non-profit organization, the Cooperative Extension Service currently uses social media to provide research-based information to a wide variety of clientele to increase its outreach and impact (Fuess et al., 2011). The Cooperative Extension Service can utilize social media to "raise awareness about programs, help educate the public, attract new constituents, and enhance communication" (Fuess et al., 2011, p. 9).

Phenomenological Research

A phenomenology is a qualitative research method utilized to define "the common meaning for several individuals of their lived experiences of a concept or a phenomenon" (Creswell, 2009, p. 57). For this study, a phenomenological approach was chosen to explore the essences of the phenomenon of marketing STEM programming from the perspectives of 4-H STEM State Specialists and their shared experiences of marketing STEM curriculum and

programming. This study will form a better understanding of how and to what extent do these shared experiences explain the phenomenon (Creswell, 2012).

The phenomenological research design is suited for this study, and it allows me to be "present throughout the process and, while understanding the phenomenon with increasing depth, the researcher also experiences growing self-awareness and self-knowledge" (Moustakas, 1994, p. 17). The qualitative research designs allow for the participants' collective voice to lead to discovery's and ideas through thematic analysis (Koltx, Odegard, Provost, Smith & Kleist, 2010).

I must follow a three-step procedure described by Moustakas (1994), as (a) determine a phenomenon to study, (b) record my assumptions and biases, and finally (c) begin data collection from individuals and participants who have all experienced the same phenomenon. Phenomenological research produces rich description and account of a specific phenomenon by glimpsing into the life of the individuals who can connect to it (Koltx et al., 2010). A phenomenological researcher ensures all information is analytically and systematically reviewed (Creswell, 2012). The quality of the research process is the most crucial aspect of the phenomenological research process (Creswell, 2012). The four standards of producing reliable research in phenomenological research are identified by Guba and Lincoln (1999) as credibility, transferability, dependability, and conformability. Langdridge (2007), describes the analytic rigors and persuasiveness the research must hold for the quality of the phenomenological analysis. Analytic rigors refer to my ability to distinguish themes from collected data (Starks & Trinidad, 2007). Data analysis will either confirm or disconfirm themes found in the collected data (Straks et al., 2007).

Phenomenological Writing Style

Data collection and gathering in qualitative research is preferred to be collected through informal interviews and observations (Creswell, 2007). Phenomenological research commonly

uses an informal reporting style because of the informality of interview techniques; this ensures participants semantics remain constant throughout the research study (Kafle, 2011). The only guidelines are as follows, “commitment to an abiding concern, oriented stance toward the question, investigating the experience as it is lived, describing the phenomenon through writing and rewriting, and consideration of parts and whole.” (Kafel, 2011 p. 191).

Since a phenomenology study is reporting the essence of participants lived experiences, everyday language may not express the essence intended by the participant (Armour, Rivaux & Bell, 2009). The interpretation of data must remain true to the linguistic style of the participants' language (Pehler, 2003; Chan, 2001; Moran, 2000). It is critical that the phenomenological researcher, to pay attention to the semantics or language used by the participants (Koltz et al., 2010). Semantics may not adequately describe or represent other verbiage used in different cultures or industries; for example, in some cultures, the word “cow” is referred to as the female bovine species it also may be used to related to female elk, whale, elephant, and camel (Lehrer, 1986).

CHAPTER III

METHODOLOGY

Introduction

Chapter III is dedicated to research design, appropriateness of the research design, sample, recruitment, data collection procedures, data analysis, textual description, composite description, quality and ethical standards, and reflectivity statement. All methods were approved by the Oklahoma State University Institutional Review Board (IRB). This chapter will describe the research design and methods used to understand the essences of experiences of marketing STEM 4-H by State STEM Specialists.

Research Design

To capture the essence of the shared experiences of marketing STEM programs in the 4-H organization a qualitative phenomenological research design was selected for this study. In this phenomenological study, I will seek to describe the meaning of participants shared lived experiences regarding the phenomenon (Creswell, 2007). This research design allows the participants to share their lived experience of marketing STEM programs within the 4-H organization.

Appropriateness of the Research Design

The majority of agricultural education research uses quantitative research designs, as noted by Dooley (2007), but to effectively serve Extension educators, qualitative methods should be incorporated into research studies. A phenomenological research study allows me to adequately analyze data by becoming immersed in the culture and literature of 4-H (Hathaway, 1995). In Extension, in-depth interviews are used to identify needs, program refinement and issue identification (Guion et al., 2011).

Sampling

A standard sampling method within phenomenological research is purposive sampling, which is often used when the characteristics of a specific group of individuals match the characteristics of the phenomenon being researched (McMillan and Schumacher, 2006). Purposive sampling guarantees data-rich responses from a knowledgeable audience (Higginbottom, 2004).

Participants were selected based on their knowledge of the phenomenon, this establishes credibility in qualitative studies by using participant criteria and by focusing on experts within their relative fields (Lincoln et al., 1985). The target population for this study was 4-H STEM State Specialists. The 4-H State STEM Specialist plays a significant role in marketing STEM education and programs within their state. Thus, this study carefully examined 4-H State STEM Specialist shared experiences of marketing STEM to 4-H audiences.

Recruitment

Participants were recruited through professional networks. I asked for participant recommendations from the National Association of Extension 4-H Agents (NEA4-HA) STEM Workgroup Chair. NEA4-HA is a professional organization dedicated to promoting,

strengthening, and advocating for the 4-H youth development organization and its professionals (NEA4-HA, 2019). The regions utilized by NEA4-HA are Southern, Northeastern, Western, and North Central (NEA4-HA, 2019). I set the following criteria for participants:

- participants must hold a state-wide 4-H STEM position
- participants must be geographically dispersed by regions throughout the U.S.
- participants must have attended the 2018 NEA4-HA annual conference
- participants must have marketed 4-H STEM as part of their job requirements

A purposive sample of 26 participants was recommended for inclusion of this study. Those who were recommended for this study received a personalized email inviting them to take part in the study, following a recommendation by Creswell (2007). This was important to ensure participants were comfortable and willing to share their story. Once participants agreed to participate in the study, a follow-up email was sent with a link to an online scheduling tool to schedule an interview time convenient for them during the 2018 NEA4-HA conference. However, during data collection some participants were unable to participate in their scheduled interviews due to changes in their availability. At that time implemented a snowball sampling technique to meet the planned criteria. I asked participants who had successfully completed an interview to identify potential participants who also meet the identified criteria.

Data Collection Procedures

In a phenomenological study, data collections techniques have the flexibility to allow participants to provide detailed accounts of their own experiences (Smith, 2004). Phenomenological research methods use a systematic method to analyze shared experiences' and gain meaning from them (Watson, Mazur, & Vincent, 2015). Following the recommendations of Geertz (1973) and Patton (2002), I collected various forms of data, which allowed for an in-depth study of the participants.

Open-ended interviews were my primary source of data collection used for interpretation. Standardized open-ended questions allowed me to probe the participants' for more in-depth information and reduced bias (Boyce & Neale, 2006) and allowed the participants to divulge information they felt was relevant. Questions topics ranged from marketing, educational background, STEM programming, STEM programming in the state they work, and job responsibilities. According to Smith (2004), the ordering of questions during an interview is not important. Interviews lasted an average of 30 to 45 minutes and were audiotaped.

During the data collection phase, participants were allowed to decide the venue for interviews. Interviews were a total of 13 questions were asked following the recommendations of Boyce et al. (2006). During in-depth interviews, I held an interview protocol for participants. I also asked probing questions about topics that arose during the interview. Protocol contained information regarding scripts and interview questions (Smith, 2004).

Data Analysis

Data analysis in a phenomenology attempts to analytically present the lived experiences of those who are participating in the study (Moustakas, 1995). The data analysis process heavily relies on the participant's dialogue to process and understand what is unique to the specific individual, their shared experiences, and the participant's views (Creswell, 2007). I followed the data analysis defined by Moustakas (1995) (a) data collection, (b) horizontalizing, (c) thematic clustering, (d) textual descriptions, (e) structural descriptions, and (f) meanings and essences. The bulk of the data consisted of the participants' interviews. Interviews were kept on a password protected recorder only accessible to me. Audio interviews were then transcribed word for word into interview transcriptions and all identifying data was removed. Transcribed interviews were sent to the participants to review the accuracy of their statements.

During the thematic review of interviews, I searched for relationships from participant transcriptions. I followed the recommendations of Creswell (2007), by highlighting quotes and statements related to the phenomenon. Highlighted quotes found were then cross-analyzed to find reoccurring themes, following the protocol designed by Straus and Corbin (2007). I then, clustered statements into recurring themes. A theme represents common or recurring patterns across data, themes are used to describe the different facets of a pattern (Connelly & Peltzer, 2016). Moustakas (1994) recommends these themes reveal the setting and the collective experiences concerning the phenomenon and individuals' experiences.

Participants' dialogue was triangulated; meaning more than one point of data was used to prove or disproved the participant found from secondary sources such as digital mediums and peer-reviewed literature (Wilson & Hutchinson 1991). Triangulation finds independent measures to validate participants' data (Wilson et al., 1991). Data triangulation ensured the validity of participants through various forms of digital media, literature, and participant interviews. Supporting data was retrieved from online databases of participants' digital media defined as state 4-H websites, Twitter, Facebook, and Instagram.

Triangulated data was collected and analyzed throughout the coding process to support themes further as the recommendations of Creswell (2007). Secondary data was collected by analyzing data to confirm participant's dialogues using digital media and peer-reviewed literature. Supporting data was compared across all interviews to support recurrent themes. The re-examination of collected data from peer-reviewed literature, digital media, and participants' accounts further clarified themes; this pattern must be repeated until no new themes emerge.

Textual Description

In phenomenological research, the textual description explains the phenomenon in a way applicable to outside the lives of the participants' "…a phenomenological description is an

example composed of examples" (van Manen, 1999, p. 122). According to Langdridge (2007), the textual description is designed to understand the lived experiences and make it somehow tangible. I must use a variety of examples so the reader can fully understand the phenomenon and applicable to the real world.

Composite Structural Description

The composite structural description was the last step in this phenomenological study and provided an example of how the 4-H State STEM Specialists could experience the phenomenon experience. This imaginative analysis component of a phenomenological research study relies on my imagination rather than data (Eddles-Hirsch, K 2015). This process as defined by Moustakas as:

> The task of imaginative variation is to seek possible meaning through the utilization of imagination, varying the frames of reference, employing polarities and reversals' and approaching the phenomenon from divergent perspectives, different positions, roles, or functions. The aim is to arrive at structural descriptions of experience, the underlying and precipitating factors that account for what is being experienced; in other words the "how" that speaks to conditions that illuminate the "what" of experience" (p. 85)

Ethical and Quality Assurance

Validity, quality, rigor, and trustworthiness must be addressed in all studies establishing reliability as the foundation of sound qualitative research (Koch, 1994). Not only does the evaluation of qualitative data analysis differ from quantitative data, but the standards are also rigorous (Kornbluh, 2015). Creswell and Miller (2000) explained researcher reflectivity is the process where I communicate my personal beliefs that may shape my research and findings.

Commonly, researchers use their experiences as a tool for a richer interpretation of experiences. Phenomenologists agree researchers' subjectivity in qualitative studies is

inescapable an implicates research and its findings (Cresswell et al., 2000). The reflexivity statement provides the readers with background information and viewpoints for the interpretation of this study (Kafel, 2011). I must recognize and describe through writing, the potential influences to data analysis. To remain true to phenomenological methods, my experiences were written in the reflexivity statement below.

Reflexivity Statement

I am a graduate student in the OSU Department of Agricultural Education Communications and Leadership. I serve as a graduate research assistant in the 4-H Youth Development office, directly working for the Oklahoma 4-H STEM State Specialist and assisting with designing and teaching STEM subjects. This study is used to complete graduate course work for the completion of my master's degree in agricultural education. Predominantly, my projects are to promote STEM on digital mediums. As such, I may have involuntarily reacted to statements by the participants, with which I may have familiarity.

My novice experiences and capabilities as a phenomenological researcher may influence answers and inhibited the full exploration of questions. I was vigilant when using both verbal and nonverbal communication. However, I cannot rule out the probability of allowing personal views to present during the interviews.

I believed it was a convenient opportunity to investigate 4-H STEM Specialists, at the NEA4-HA annual national conference in Columbus, Ohio. This opportunity allowed me to collect detailed descriptions and observations of participants throughout the conference. This study is completed with the supervision of a faculty advisor and follows the standards of the Oklahoma Institutional Review Board for the ethical conduct of research.

CHAPTER IV

FINDINGS

Introduction

This chapter is dedicated to the analysis and interpretation of data collected from nine 4-H STEM State Specialists. The purpose of this study was to identify the essence and experiences of participants' and their strategies of marketing STEM. Mainly, data relied on nine interviews from 4-H STEM State Specialist. This chapter will answer the central research question and offer insight into marketing STEM programs in the 4-H organization. The findings represent the collective "voice" of the s lived experiences of nine 4-H STEM Specialists from all Extension regions of the U.S. to represent a national perspective of STEM marketing.

Data Description

A phenomenological study explores the lived experiences of a homogenous group of participants chosen by me (Kafle, 2011). Bamberger et al. (2012), explained that qualitative research is designed to create an understanding unlike quantitative data, which is constructed to explain. This qualitative data highlights essential experiences as it is related to the participants and their lives.

Characteristics of the Participants

The size of qualitative studies is typically small and ranges from one to 20 participants (Creswell, 1998). Polkinghorne (1989) suggests a pure phenomenological study consist of the researcher interviewing five to 25 individuals who have all experienced the phenomenon. A total of nine extensive in-depth interviews with 4-H STEM Specialist were conducted. Participants were geographically dispersed from all four regions of the U.S., representing a national sample. Five of the participants were from recommendations of the NEA4-HA STEM Working Group Chair, and four were referred from snowball sampling. The total years in within their current STEM professions varied among participants from 2-40 years, averaging 14.5. All participants held a master's degree and higher. Five participants were male and four were female.

Table 1

Selected Participants

Participant	*Educational Level*	*Region*	*Gender*	*Years of Experience*
1	Ph.D.	Southern	Male	40
2.	Ph.D.	North Central	Male	15
3.	M.S.	North Central	Female	7
4.	M.S.	Southern	Female	2
5.	M.S.	Western	Male	18
6.	M.S.	Southern	Male	13
7.	M.S.	Western	Female	23
8.	Ph.D.	North Eastern	Female	6
9.	M.S.	North Eastern	Male	7

Data and Analysis

I transcribed each interview and uploaded into the computer software, ATLISTI, for further analysis. During open coding, constant comparative analysis of all nine interviews helped me compare all interviews with each other. This process enabled me to remain consistent in the data analysis process, by examining key points from one participant to another. Open coding was

then formed into emerging themes and subthemes. During the selective coding process, I searched to find themes emerging from the commonalities within open codes.

Theme 1: *Develop and use relationships*

Participant dialogue demonstrated personal and professional relationships as marketing tools. This central theme speaks the power of human connections and relationships. Relationships as a means of marketing is based on building relationships with specific target audiences; relationship marketing is the key to successful businesses models (Byington, 2012). Often in an attempt to reach audiences, Extension professionals forget the most important marketing strategy lies within pre-built relationships (Kraenzel, 2001). Ironically, these relationships did not need to be personal and could be fostered through networking sites. Participant 3 said, "*You almost need to build your own network, you know, and I think [stutters] I think that's what Twitter does, that's what Facebook does, is that you can target and build that group of people that want to hear that information*."

Triangulation of literature found, 4-H clientele are using more technology than college students (Guenthner & Swan 2011). According to Ellison, Steinfield, and Lampe (2007), Facebook has the potential to heighten the 4-H organizations' and its ability to strengthen relationships and establish networks. Developing and using relationships is a stand-alone theme not to be converted into other themes; ironically; it lies at the core of all marketing tactics in this study. Reading through interview transcripts, participants language made it apparent relationships prevail throughout the 4-H organization and all themes. This is because the 4-H State STEM Specialists shared experiences' of using specific relationships to build and market STEM programs to 4-H educators. Participants are using established relationships as a means to market STEM programming.

Table 2

Participants Quotations

Quotations
"I depend on my colleagues, statewide, now locally, and I depend on my contacts with the schools. My contacts with the local community colleges, my contacts locally are different. I depend on my colleague statewide; I depend on my colleagues nationwide. So locally, I find in contact with science teachers, club leaders, community leaders with maker space, you know, people like that" (Participant 9)
*"Yeah, I mean, I really think that personal interaction, sometimes we are just quick to send an email, whereas had I made a phone call to have a conversation about it, or met face to face with them, that actually changes the entire dynamic" (*Participant 3*)*
"They'll come and they [stutter] they get a refresher, we teach them about new strategies and new educational curriculum. And so it seemed like those face to face trainings for agents to go far" (Participant 6)
"The types of relationships that I have with people in regards to sharing our resources and utilizing our equipment and things." (Participant 4)
"I do think that face to face is how you nurture the relationship with volunteers" (Participant 2)

Professional developments and conferences foster relationships between peers within the 4-H organization (Thomas, Stephens, Stripling & Stephenson, 2018). The working values of these relationships are used to an extent, which is essential for 4-H State STEM Specialists. Coherently, the participants discussed how relationships could provide opportunities to work collaboratively with peers and educators. Participant 9 evaluated their experience when working on 4-H National Youth Science Day curriculum; and explained, it would not have been possible without her ability to build relationships with peers at conferences. The inner workings of these professional relationships as a marketing tool within itself for State STEM Specialist. When probed, the participants were asked where resources and curriculum are obtained each participant named an individual state and began to refer the specialist by name and the great work they are doing.

"*I would say one of the places that I start is looking at folks who are effective leaders in those states. So, for instance, [NAME], was at [STATE]. Moreover, so that was one place where I looked to find a curriculum*" (Participant 9).

Data collected found relationships through digital mediums and face-to-face can provide a framework for marketing STEM educational programs. Throughout the 21st century relationships have ultimately changed with technological advancements (Ballouli, & Hutchinson 2010). Participants shared the importance of using connections to market information. The significance of building relationships with people who are interested in information to be marketed is critical. Participants ensure the information is targeted to an audience who wants to know the information and targeting these groups with information relevant to them through Twitter or Facebook is essential.

Participant 2 explained, through relationships, he learned 4-H educators struggled understanding STEM curriculum. Knowing this he re-designed curriculum to fit the needs of these educators. Participant 2 said,

Curricula are not designed for non-STEM experts the engineering design curriculum we have is designed for people that might not understand STEM. I mean, we might have an engineer or STEM professionals, but they're not trained educators, we needed something that would be able to support those people. So our strategies for marketing to get those volunteers involved was to make it realistic. (Participant 2).

Participants shared the power relationships could make or break 4-H STEM programs. Participant 5 said, "*I believe if we nurture the relationships between volunteers we're going to be successful.*" Throughout interviews participants shared a sense that careers and programs depend on their abilities to build relationships with 4-H educators and peers. Participants described

relationships are a marketing strategy centered on participants being good listeners, offering resources and information, being approachable, and kind. Participant 5 said,

> *One of my superpowers is that whenever I sit down and talk with a teacher, or an educator or an agent, is that when I start talking I can immediately start making connections with but I can't have a conversation one on one with everybody, right? And how can I transfer that knowledge into you can do that too, right? So I don't make those connections for you. I want to show you how to make those connections* (Participant 5).

These reoccurring statements suggested the participants believed positive personal relationships are essential. All the 4-H State Specialists interviewed suggested the functions of these relationships with educators are important regarding the projected scope of their programs. I began to recognize similar stories between each participant which expressed the stronger connection you have with educators, volunteers, and youth; participants believed it was equivalent to multiple opportunities to network and share events and programs.

With great detail, one of the participants explained, developing face-to-face relationships with volunteers, I can encourage them to become more involved if they become disinterested. Participant 2 said,

> *But what I found useful is that relationships with the volunteers again, in [STATE] our volunteers are often the ones recruiting the youth and actively recruiting families in their communities and I see our staff's role to be to recruit those volunteers to help them understand what it is that they're going to do because then they're willing to go* (Participant 2).

Face-to-face relationships can form an intimacy and sense of trust with people. It is from relationships where participants learn people's hobbies, strengths, and interest, implicitly functioning as a market tool. Participant 3 said,

> *I really think that personal interaction, sometimes we are just quick to send an email, whereas had I made a phone call to have a conversation about it or met face to face with them, that actually changes the entire dynamic.*

Another Participant explained,

> *the only reason I have an active volunteer group is we meet face-to-face, and it's this connection making volunteers want to participate as well as adds a level accountability. When I notice a volunteer not attending meetings, I will call them an ask if there is something is wrong or is there something we can change* (Participant 2)?

Personal and professional relationships emerged as a channel, which STEM specialists can market STEM. Another Participant 9 explained, "*I could call a school and ask if I can come present as simple as that.*"

Theme 2: *Directly reaching audiences*

The discussion of marketing strategies inevitably brought the conversation to the theme *directly reaching audiences*. Participants' described the most commonly used tools and mediums to directly reach audiences were Facebook, Twitter, Instagram, videos, Pinterest, state 4-H websites, Listservs, Facebook groups, and Digital Chat groups (Zoom). During interviews, participants outlined ways digital medias have changed marketing strategies, concepts, and practices resulting as the conventional approach to directly reaching audiences. I decided to investigate this topic deeper and probe participant's, which revealed an appreciation for digital mediums in their daily roles to directly reach audiences.

Table 3

Participants Quotations

Quotations
"You almost need to build your own network, you know, and I think [stutters] I think that's what Twitter does, that's what Facebook does, is that you can target you can build that group of people that want to hear that information" (Participant 3)
"And so if you actually want to know that something's received, that would be need to be a direct communication with your specific audience." (Participant 7)
"So an effective strategy to do that is ironically one, and this one isn't one that I would say would be one that gets them a lot of details, but that is exposure is Twitter [pause] Twitter, and Facebook." (Participant 3)
"Twitter as your where your professionals are, I feel like at least for me, that's where my teacher friends and parents." (Participant 4)
"And so, I can get some information out to teachers that way, a whole lot easier directly, I try not to go over the county agent, if that makes sense. I tried to go through those channels, and let the county agent those relationships and not myself."
"To create digital content for [stutter] because that's the nature of the world today. Digital technology is all around us and is continuing to evolve and advance it just make sense for us [4-H] to have a presence there. One of 4-H frustrations is a barrier is 4-H so caught up in producing traditional programs." (Participant 1)
"let's come to a one, [stutter] one, stop [stutter] shop, or you think [stutter] get everything that you need to get your curriculum, you can get your competition information, you can get your resources that you need one top one stop shop, social media, you got to go there anyway…" (Participant 4)
"Get those volunteers involved was to make it realistic, something they can see themselves doing and supporting us to use any digital marketing or traditional marketing as well. We do use some digital and traditional marketing [pause]. We did a really kick ass video on trying to recruit adult volunteers and partners do our engineering and it is a beautiful video." (Participant 2)

Without digital tools to directly reach audiences, participants collectively felt programs would frequently become forgotten about or become irrelevant. Participants all shared digital mediums could instantly reach thousands of 4-H youth, volunteers, educators, and members STEM programs have gained popularity. Participant 4 spoke to the importance of segmenting

audiences, "*the most effective strategy is getting the word out to the people that need that information*."

Digital media as a tool to directly reach audiences has impacted 4-H State STEM Specialists and their marketing efforts and aided in the dissemination of STEM information. Each participant proudly boasted marketing 4-H events through digital media brings more significant numbers to events.

Participant 6, explained their mixed-method strategy of using digital mediums and relationship marketing to reach audiences directly.

> *It's actually figuring out how you can get your information out to a network of people that need to know that information. And so that's a barrier, right? And so those networks don't really exist, you either have to create those networks or figure out the delivery method that's going to get your message to the right people.* (Participant 6)

Participant 4 added more detail of her strategy to directly reach audiences.

> *I retweet things, if there's a really good idea that I see come across, like, you know, way to go. I also do a lot of positive reinforcement. So if I see my agents posting about some great side things, I may either comment on their posts or retweet with their posts and say "hey, great job!"* (Participant 4).

A powerful statement supported through triangulation of literature and participant dialogue. For the 4-H organization and STEM programs to maintain their relevancy among audiences by participating in platforms such as Twitter, Pinterest, YouTube, and listservs, explaining eXtension to needs to build popularity with these sites (Arnold et al., 2012).

Although the participants used and discussed different tactics to reach audiences directly, it has become an overall central theme. A common perception from participants explained the

inclusion of digital technology is an inescapable tool in our society with its increasing popularity, there is no ignoring its effectiveness to directly reach audiences. Participants 3 shared their tactics to reach segmented audiences,

> *Make the message appropriate for the audience. You know, if it's teens, you know, having it be kid friendly, using QR codes, having it, you know, go out on the Snapchat pages and, you know, different things like that, if it's adults, it's more, I would say, probably more electronic email, PDF, and publications* (Participant 3).

A majority of the respondents established how directly reaching audiences have increased participation and recognition of STEM programming. These channels have the unique capability to reach segmented audiences interested in STEM. Participant 3 explain their tactic to reach targeted audiences,

> *All of that, I think we use all forms again, depending on you know, if I'm trying to attract teen teachers, you know, it's texting and it's, you know, Twitter and, you know, more of a social media feed, if it's an adult volunteer than it might be a little bit more traditional that we're using depending on you know, as you said they use Facebook's will use Facebook for that audiences.* (Participant 3).

Participant 1 is pushing for digital learning spaces and resources urging the 4-H organization to exist in the digital world by creating digital learning spaces. This tactic would provide direct interaction with youth, without the time constraint of scheduled 4-H events. The participant emphasizes the 4-H organization must become relevant by using innovative approaches. Furthering his idea 4-H should initiate a step to becoming digital he stated,

> *To accommodate kids in a different way means we're going to have to change the way we've always done things so what the content digital content looks like how it's*

presented… a digital badge it would have the evidence and the information embedded in so it makes in the digital that's the neat thing about being in the digital environment (Participant 1).

Theme 3*: Reduce fear and apprehension from gatekeepers*

From initial interviews, it became a clear pattern or theme from the participants' experiences *reducing fear and apprehension from gatekeepers* was significant to marketing 4-H STEM programs. As a mean to reduce this reported fear, in-services were a primary tactic used to market 4-H STEM programming. An in-service is a professional training effort to learn about new and updated programs and activities (Smith, & Enfield, 2002). Reflecting upon post-interviews, all participants had marketed their STEM programs by reducing fear and apprehension of gatekeepers. Participants' has reported an increased number of youth participants and the longevity of programs. Participant 8 commented on the essence of this theme and said,

the adults are the gatekeepers to what happens, right? You know, so if you have an adult who's unsure of themselves about STEM, or doesn't really quite understand it, or feels like they're not competent enough, they might not even extend the opportunity to kids, right? So I give the information to you, if you're a project leader, or a club leader, or whatever, that we've got a workshop or a training coming up, they might make the decision at their level that this isn't going to be right for my kids, because I can't do it. So I think we need to kind of think about those experiences relative to. (Participant 8).

In-services provide educators with hands-on experiences, collaborations, and brainstorming with peer educators. When new programming and curriculum are released, without proper trainings educators can become overwhelmed leading to fear. In-services allow 4-H educators to learn the skills through step-by-step instructions, ultimately; reducing insecurities and incorrect teaching methods. Participant's expressed comments such as,

So, it might seem really scary to people, you know, I don't know anything about genetics, I don't know anything about, you know, these kinds of things, but demonstrating, that there's training, there's support, there's materials, there's resources, and they are not going to be just left out there to figure it out by yourself. I can, I think can be really reassuring for people (Participant 8).

Table 4

Participants Quotations

Quotations
"One of my observations is that much of the STEM curriculum is not for a novice audience. It's for STEM educators, it's for science teachers in school adapted for them to teach it after school. And that often is not our audience. I mean, we might have engineer or STEM professionals, but they're not trained educators, we needed something that would be able to support those people." (Participant 2)
"I don't want them to have to sit and study for two hours to figure out what is this lesson, I want them to be able to look at a glance at it for about 30 minutes. Okay, I can do this." (Participant 4)
"Getting those resources in the hands of agents, I have figured out that the agents are in a dire need of good grab and go lessons, not necessarily lessons that they have to come to me to get a piece of technology or some equipment." (Participant 4)
"So I have a lending library where people can kind of come in and either have professional development with that, or if they feel competent, they can just borrow the kids those things" "...in-service for agents that would [pause] that educates the agent on what the program is, gives them a step by step process of here's how you do it." (Participant 7)
"We're here to help you succeed. But part of the success has to come from failure. And that's where their learning process comes from." (Participant 5)
"they do trainings with us, that's where they kind of get them more hands on experience in a safe environment, then they feel more confident of doing it by themselves in their own County, and we've got to provide a safe environment for them." (Participant 9)
"Hey, this was great, you know, I really enjoyed using in a classroom or I felt like it was easy to do, sort of empowering educators to feel comfortable science with kids, because I can't be everywhere. So it's kind of the same thing, but, you know, different groups." (Participant 6)

"So I guess a great sense of accomplishment is when a colleague of mine or volunteer or teen leader understands the information, project information and then carries [stutters] carries it on successful." (Participant 9)

"A volunteer leader or the local agent, volunteer leader may be intimidated about STEM but the teen isn't. So, if you have some teen leaders that are [pause] interested in STEM topics, keep them engaged. The next thing you know they're leading the club [stutters] the [stutter] the club. They're doing the learning, helping to learn I don't have to know about robotics neither does the volunteer leaders. They can be facilitators." (Participant 2)

"And so I'm really excited about producing a product that other people want to do, and then collaborating with others to make it happen. And I actually went to [STATE] and went to [STATE] went to [STATE] to help train their teen leaders" (Participant 3)

"I'm working with some teens as teachers is as a pretty popular program in [STATE] we use a lot of modules and curriculum for that. And, you know, it's great, again, for skill building and leadership opportunities. So kind of depends on what the audience wants." (Participant 8)

From interviews, each participant customizes programming to their states educational level and available resources. In-service events provide benefits to 4-H State STEM Specialists, the opportunity to access the needs of 4-H educators. Participants offered examples of these steps taken to reduce fear such as providing resources, grab and go STEM kits, and re-written curriculum for novice STEM educators. Participants shared *"We're here to help you succeed. But part of the success has to come from failure. And that's where their learning process comes from"* (Participant 4).

All participants emphasized the value of reducing fear and its impacts on 4-H STEM curriculum and programs. Further reinforced through triangulation of literature indicates an increased curiosity of subject matter after training (Konen & Horton., 2000). Professional developments provide an opportunity for 4-H educators to build an understanding and skills with new STEM curriculum and activities (Konen et al., 2000).

Reducing fear and apprehension from gatekeepers can ensure 4-H educators return to their counties excited to teach programs, volunteers, and teen leaders. Participant 9 said, "*Our in-*

services are rated highly, and they go to their home counties and engage in the same activities in the same project. So I would say that's, that's how I interpret to my advantage, personally with the program."

Participants shared the importance of teen leaders to reduce fear as an essential asset of 4-H, especially in STEM program areas covering topics such as computers, robotics, or technology. Participants shared, while adults may fear technological projects, teens may have a better understanding of these topics can easily teach it to others. Participant 1 described experiences with hands-on training and the importance of teen-leaders,

> *Well locally, our county office does a training [pause] for say robotics and rocketry or drones. I'll do training at a local setting [pause] and encourage them to invite [umm] of course the staff, the volunteer leaders that are interested but also teen leaders that are interested because teen leaders can help my whole thing happen* (Participant 1).

Participant 1, comments were supported the through triangulation of digital media specifically a state 4-H Facebook page. For example,

> *"[youth name], [youth name] and [youth name] are having a great time at the 4-H STEM & CS Training!! Today we are learning more about robotics*. (Participant 1, state 4-H Facebook Post)

One participant explained their open-door policy to reduce fear from 4-H educators. Participant 5 described their relationship with 4-H educators, educators are always welcomed to email, call, and come in their office. Sitting down with a 4-H educator can eliminate any fears they may have — especially educators who are not active in specific subject areas. *I made a phone call to have a conversation about it, or met face to face with them, that actually changes the entire dynamic* (Participants 3).

For example, many 4-H educators' fear of technology and breaking devices used to teach youth. From interviews, each participant mentioned fear as a barrier of STEM for many educators, in-services reduce this fear. According to Konen et al. (2000), the reported value of hands-on is a decreased level of anxiety, and increased educator confidence. Participants of professional development experiences have reported decreased fear or intimidation when teaching.

Theme 4: *Make curriculum, fun, unique, or creative*

Make curriculum, fun, unique, or creative as a theme is established around the inclusion of youth learning in unique, fun, and creative ways. Data analysis provided sub-themes, which were the infusion of STEM into non-STEM projects, using pop-culture topics, and fun activities.

Participants are using the culturally relevant curriculum as a vehicle for youth learning such as Zombie Training Guides, AL's Spells and Potions, Monarchs on the Move, Dinosaur Camp, and traditional 4-H camps. Participant 4 explained curriculum topics of high interest to youth will always be the easiest to promote, especially if there is an opportunity for experience. Continuing to add, "*and I would say that, that hands-on things that the kids are going to be doing and experiencing those are, you know, people want to do those things*" (Participant 4).

Triangulated and supported with the philosophical underpinnings of Kolb's ELT, that learning is enhanced through active experiences. 4-H State STEM Specialists capitalizes on these experiences by transforming them into knowledge. Patton (2002) and other phenomenologist report the importance of these experiences in a specific time and place. To capture the attention of youth whom may not be typically interested in traditional STEM curriculum, 4-H STEM State Specialists have implemented creative curriculum (Defore et al., 2011).

Table 5

Participants Quotations

Quotations
"I think our biggest effective strategy is we've got to do [pause] is make it a little more market driven. And by that what I'm is figure out what are some pop culture things within reason that we can spin it as, so for example, we can't call Harry Potter camp, or we can call it Al's Spells and Potions and that our spells and potions." (Participant 5)
"All of a sudden kids, are like "oh, this is a Harry Potter camp". And that's where we can do things like dissect owl pellets, do kitchen chemistry experiments, those kinds of things that are STEM but they attract a broader audience, and it had to be a science camp." (Participant 5)
"And sometimes, you know, like stem camp like that. Does it sound fancy? Do we need to give it another name or, you know, using certain visuals to get people attracted, or do you have a Harry Potter camp?" (Participant 8)
"New formats, a twist on angle regarding science that may not have been explored before. Or, for instance, I'm doing a new renewable, sustainable energy I was doing a project called the Science of Fire. I've taken some of the old, old, old 4-H activities that used to be outdoor cooking, you know, burning with wood outdoors. I mean, I did it as a child taking some of the fun stuff related to that. But then plugging in the science, bio gasification, complete combustion, a lot of things that that people may not have understood before. But it's significant now because the same concepts the science behind that fire is helping companies to build extremely efficient stoves that are saving lives." (Participant 9)
"..new formats, a twist on angle regarding science that may not have been explored before." (Participant 9)
"Camping centers also do quite a bit of science and nature education. So that's, that's the biggest push right now" (Participant 6)
"..hands on the curriculum is concerned, if it has a real fun element, we can demonstrate that the youth and the adults to teach it not having a good time and enjoy the project. I think that's [stutter] that's important as well." (Participant 7)
"And so [curriculum], for instance, that's, that's on people's radar, and everybody wants to do monarch programming, and so identifying what's of high interest, and then creating or offering opportunities for those experiences? (Participant 3)
"We will make a bag. So that's the textile project. But then we're going to add an LED screen that has your message board name going across it and all the sudden now becomes a technology project" (Participant 5)

"..let's just go bake cookies. Well, let's make it a science experiment. Let's go from there and see if we can create our own recipe that's going to be even better, right? So that's where I want to take it moving forward" (Participant 4)

Triangulation of literature and with previous research in educational settings has found pop-culture topics will increase teacher participation and overall likability of the curriculum and activities (McKnight, 2015). Most importantly STEM curriculum should allow youth to investigate topics, which interest them, in formal and informal settings (Baker & Robinson, 2016).

The movement which purposely adds STEM into a traditional project is called the Maker Movement. Makers encourage the use of new technology to make an innovative product on the topics of recipes, gardening, and sewing. Makers facilitate popular projects of the last century such as sewing and gardening into popular projects of this century such as drones and coding, creating relevancy of the 4-H organization. For example, one participant added to their STEM program the Science of Cookies curriculum, as part of an everyday STEM challenge this project blends 20th and 21st-century projects. Youth bake several batches of cookies adding and subtracting certain ingredients to each batch such as baking powder and baking soda, allowing youth to see the effect of each element visually. This project incorporates the project areas food and nutrition and STEM.

> *So we have two different groups, each group is going to eliminate one ingredient from the cookie. And let's see what the results are. And let's compare and contrast. Right? So like taking that idea, let's just go bake cookies. Well, let's make it a science experiment. Let's go from there and see if we can create our own recipe that's going to be even better, right? So that's where I want to take it moving forward* (Participant 4).

The idea of infusing STEM into non-STEM projects has caught the attention of 4-H. Now, 4-H is encouraging Makers to share their creations by joining 4-H and entering their projects in their county and state fairs. These efforts will increase the reach of 4-H to a new audience and bring 4-H to a place of relevancy in the 21st century.

> *The opportunity is Makers overlaps with existing programming, consumer science, woodworking, sometimes urban agriculture garden, there's a lot of projects and Makers overlap with that, and so people are confused.* (Participant 5).

During my research, 4-H STEM State Specialists consistently mentioned transitioning curriculum into an innovative format without the complete re-designing curriculum. For example, Al's Spells and Potions Camp curriculum involves youth to dissecting owl pellets with a wizard theme. For this camp, no new curriculum was required only "*twisting*" the facilitation and teaching methods. Participants 10 said, "*I love, the idea of not having to recreate the wheel each time."*

Participants are attempting to become relevant to youth with the programs as mentioned earlier. To overcome the challenge of becoming relevant to youth's interest and needs are essential. Findings from this study, have shown the ability of participants to change and be connected to youth's interest in the 21st century. The demanding pressures to increase STEM education, it is often overlooked youth want new and fun experiences. Literature supports fun and engaging activities tend to hook youth or keep bringing them back to 4-H (Ferrari & Turner, 2004).

As participants shared their experiences working with an innovative curriculum, it is clear the impact 4-H can have on youth; participants want to provide youth with once and a lifetime experience. Discussion of these programs made participants feel a sense of achievement. Participant 8 shared a story of a 4-H group was going to a mall for the first time. "*Kids were so*

excited; they kept asking to ride the elevator because they have never seen one in person. 4-H provides youth the opportunity to see travel with others who share a common interest." Participant 4 said, "*we target events around college locations in hopes of getting students on a college campus, helping youth to envision themselves as future as a college student.*"

Participants also shared stories of revitalizing curriculum through creative, fun, and unique efforts. Specific curriculum and events can be reinvigorated when they are renamed or used in a different context. Triangulation through social media post revealed further evidence from Participant 6, "*Groot, Geek, or Fortnite? We'll be giving away all of these 4-H donated quilts tomorrow at Code Camp. Looking forward to seeing you all bright and early for check-in at 7 am at the [LOCATION] Gardner Center."* This is an ordinary camp with a twist or theme to attract youth.

Large camping states have begun to incorporate STEM into camping activities. Many participants took this same approach with traditional camping; Participant 9 teaches the Science of Fire an older bioenergy curriculum, which has new relevancy by adding it to a traditional camp. Triangulation from Participant 9 found, from the 4-H state website promoting nine accredited 4-H camps described in the "about us" tab as "*Being one of the oldest 4H camp in the state, we are dedicated to ensuring your child's safety and fun while offering high quality 4H educational programs"* (Participant 9, state 4-H website).

Participant 9 claims he has had much more success with the curriculum when taught as a camping event. Participant 7 described camps electricity curriculum is more commonly used as a camping curriculum, "*And so because camps are seen as a fun activity, it's easier to promote STEM activities that we have.*" Participant 9 recognized the value of these camps and offers scholarships for low-income youth. Breaking away from the conventional 4-H model, Participant 6 said, "*4-H is more than cows and cupcakes*", the purposeful integration of STEM into

traditional projects is essential, by adding value to traditional 4-H projects youth can still learn STEM concepts. Interestingly, every participant's most popular STEM project is agricultural projects, but youth do not make the connection between agriculture is a science and a STEM project area.

> *A livestock project is more than just raising an animal, it involves genetics, biology, math, engineering, critical thinking, and much more* (Participant 5).

Theme 5*: Consider potential missed markets*

During interviews participants share the details of how to reach their current target audience, but shared little detail of reaching those not involved with 4-H. In phenomenological research studies, it is my role to not only to search for data emerging from themes but to analyze an overwhelming amount of data not found in participant narratives. This central theme reveals potential missed marketing segments (Ryan & Benard, 2003). Bogdan and Taylor (1975) suggested as a researcher you should be "alert to topics that your subjects either intentionally or unintentionally avoid" (p. 82).

The last step in the thematic review process is to identify themes from missing data of the participant's narratives. During the analysis of data, I looked for not only looked for data to emerge but observed data which had not surfaced. Missing data in the collective participant's narratives lead me to find potential missed markets. The data is missing in a sense as the participants excluded to mention marketing strategies and to reach diverse audiences and those who are not involved with the 4-H organization.

It should be noted the term underserved and diverse includes various audiences (rural audiences, girls and women, those with disabilities, the homeless, veterans, and LGBT populations). For this study, it will be describing racial/ethnic audiences which are 'underrepresented' in STEM programming. The National Science Foundation recognizes three

groups which are underrepresented in STEM including— Blacks, Hispanics, and American Indians. These gaps in data require investigations into further research questions and theories (Singh et al., 2003). As outlined by the National 4-H Learning Priorities Steering Committee a core philosophy state,

> *For youth development professionals to be successful in our multicultural society, they must have a deep understanding of the impact of limited access and opportunities and inequities on the lives of many cultural groups living in the U.S. today* (National 4-H Learning Priorities Equity, Access, and Opportunity, 2008, p. 1).

The ability to recruit and maintain missed markets such as diverse populations within the National 4-H organization remains low. Because images on the state 4-H websites for the sate included in this study did not accurately reflect the demographics of those state, I concluded it is possible those state are missing opportunities to more effectively market to these audiences. Below you can see the actual representation of state demographics versus 4-H demographics.

Table 6

Participants State demographics from the U.S. census in comparison to ES 237 information collected from the participant's state.

Top five State Demographics %	*Top five 4-H Demographics %*
Participant 1	
White 68.4	White 64.82
Black 26.5	Black 29.54
Asian 1.3	Asian .97
Native American .5	Native American .79
Other 3.2	Other 3.9

Participant 2

White 83.7	White 87.5
Black 6.0	Black 4.01
Asian 4.7	Asian 1.15
Native American 1.0	Native American .59
Other 4.5	Other 2.45

Participant 3

White 90.6	White 89.5
Black 3.4	Black 6.2
Asian 2.3	Asian 1.45
Native American	Native American .72
Other 2.1	Other 2.03

Participant 4

White 77.3	White 72.81
Black 15.4	Black 19.23
Asian	Asian .77
Native American	Native American .95
Other	Other 6.12

Participant 5

White 86.8	White 91.22
Black 1.1	Black 1.71
Asian 2.3	Asian .81
Native American 1.1	Native American 1.5
Other 8.7	Other 5.2

Participant 6

White 77.8	White 84.6
Black 16.8	Black 11.81
Asian 1.7	Asian 1.8
Native American .3	Native American .96
Other 3.4	Other 1.46

Participant 7	
White 60.6	White 76.23
Black 5.8	Black 4.60
Asian 14.1	Asian 7.01
Native American .7	Native American 2.16
Other 32.1	Other 9.23
Participant 8	
White 93.3	White 88.6
Black 3.6	Black 4.38
Asian .8	Asian 4.85
Native American 0	Native American 0
Other	Other 2.1
Participant 9	
White 63.8	White 84.79
Black 15.7	Black 11.36
Asian 8.3	Asian 3.17
Native American .4	Native American .35
Other 11.7	Other 3.92

U.S. Census Bureau (2019) *2019 Population by Race.* Retrieved from http://worldpopulationreview.com/states/.

Table 6 contains ES 237 and census data to represent factual demographics and information from the youth reached within each state. The ES-237 data is an annual enrollment report for individual participants' states, which include information regarding youth participants race, ethnicity, and gender. Findings from ES 237's found the majority of the participants reach higher numbers of primarily white youth when compared to their state demographics. Inferring a missed market of diverse audiences. For example, participant 6's home state is 77.6% white; however, the 4-H organization in states its reach is approximately 88.6% white youth.

According to *Engaging Audiences Underrepresented in STEM Fields* (2015), to attract the missed market of diverse youth STEM programs should, draw on cultural practices, implement programs with cultural groups in mind, and reflect social structures of cultures.

Previous research found to engage culturally diverse audience's to programs you must (a) build relationships among the target audiences, (b) ensure target audience are active partners, (c) understand participants' cultural identity/practices, (d) integrate culturally relevant and meaningful experiences, (e) utilize bilingual or bicultural educators if appropriate, (f) use family-oriented curriculum, (g) emphasize educational skills learned, and (h) identify potential barriers to participation (Zeigler, 2015).

In many underrepresented audiences especially black males, are faced with familial problems, discrimination, and racism (Caldwell, Kohn-Wood, Schmeelk-Cone, Chavous, & Zimmerman, 2004). A feeling of racial discrimination is the number one factor of low-engagement in after-school programs and is often a contributing factor to poor grades and violent activities (Caldwell et al., 2004). According to LeVergne (2013), the lack of irrelevance and information about 4-H programs is the most significant barrier to the inclusion of missed markets within the 4-H organization programs. Alston and Crutchfield (2009) stated, that the 4-H organization and its programs are not equipped to handle the growing needs of a diverse population. The 4-H organization must develop a marketing program which can reach diverse audiences (LeVergne, 2013).

The 4-H State STEM Specialists from this study STEM programs include, Computer Science, Entomology, Meat Science, Rocketry, Robotics, Biological Science, GPS, Photography, 4-Hi Does Ag, 4-Hi Feels Great, 4-Hi Flies High, 4-Hi Goes Fast, 4-H Innovators, Aerospace and Rocketry, Drone Discovery, Geospatial Technology, Animal Science, Backyard STEM, Electric Camp, Rocketry, Machines, Electronics, Woodworking, 4-H First Lego League, AgriSTEM, Code Camp, Plant Science, Astronomy, Climatology, Water Education, Gardening, R.O.V., 4-H Maker, Kitchen Science, Plant Energy, Tractor Small Engines, Bicycling, Wildlife, Water & Wetlands, Vet Science, Bee Challenge, and Agovation. I concluded a large missed market of STEM programming lies with the lack of cultural relevance of 4-H STEM programs.

According to Zeigler's (2015) criteria to engaging underrepresented audiences, these aforementioned programs fail to include, standard cultural practices, a reflection of social structures within cultures, the understanding of participants' cultural identity/practices, integrate culturally relevant and use a family-oriented curriculum. Findings by Cano and Bankston (1992) participants agreed that more minority role models should be incorporated into 4-H programming.

Summary

The summary is composed of a textural and structural description of the phenomenon structural description and the essence of lived experiences of marketing STEM curriculum, program, and events.

Textual Description

In the first-person narratives, it should be noted that participants are under pressure to increase participation STEM curriculum, program, and activities with decreased budgets in their positions. These experiences often impact every participant's choice of how they market curriculum, program, and events.

Because of these threats, every participant is continually adapting and changing their marketing practices; one strategy is to reduce fear and apprehensions of gatekeepers. In-service events attract educators and provide the opportunity for hands-on learning. In-services reduce educator fear and increase the longevity of programming. Many participant's targets these in-service opportunities toward teen-leaders, because of their lack of fear in regards to technology.

With the help of digital mediums to directly reach audiences, educators have increased STEM curriculum, program, and activities through these efforts. Digital mediums effects have resulted in efficient and concise marketing — the primary medium used in Facebook and state 4-H websites. Data collected implies Twitter, Instagram, videos, Pinterest, State 4-H Websites,

Listservs, Facebook groups, and Digital Chat groups (Zoom) are tools utilized by 4-H State STEM Specialists to a lower extent.

Another reality of marketing is the effect relationships play in their ability to promote curriculum, programs, and events. 4-H STEM State Specialists interactions and relationships with educators offer an insight into the needs of educators. Data revealed individual states require different resources to reduce fear from the re-designed curriculum, grab and go kits, and resources.

Looking forward, 4-H State STEM Specialists focus on creative curriculum. These curricula offer youth the chance to learn in new and fun ways. This idea provides youth a once in a lifetime opportunity. Finally, from the lack of data, I found the importance of marketing to underrepresented audiences. The audience could be untapped resources and potential 4-H members.

Composite Structural Description

All the participants openly struggle to market STEM programming. Sitting at their computer a new curriculum catches the eye of the 4-H STEM State Specialist. Looking to pop-culture and Google search engines, they find a themed curriculum is popular. He or she feels this would succeed in their state, based on their relationships with educators. Knowing there is a lack of female youth in the state attending STEM events, a Princess Themed curriculum, could attract potential missed audiences. Relying on relationships, the STEM Specialists calls a local volunteer to see if their club would be interested in teaching the curriculum. The event draws a large number of youths.

The STEM State Specialists is shocked; the program was a huge success and thought the program should be implemented across the state. First, they decide to teach an in-service over the curriculum. An email is sent over the educator listserv promoting the in-service. Unknown if the

listserv was effective, to increase attendance, the State Specialist directly reaches its audiences and calls several educators to give them more details and raise interest. The State Specialist posts the event on the local STEM Facebook groups, to reach an audience who might be interested. Except for female youth, the State Specialist forgets to reach underrepresented audiences.

A large number of educators attend the event, but the educators aren't excited to take it to their home county. The State Specialist ask 4-H educators; why don't you think this will be popular? The 4-H educator explains the pieces needed are costly and breakable. They do not believe it will work. Not ready to give up the State Specialist creates a grab and go kit, for educators with extra pieces free to check out at the convenience of 4-H educators. It works, educators take the kits to their home county with the resources and training. The next day the state 4-H Facebook post photos and details about the event. The post is printed as a flyer and posted on message boards and given to volunteers and teen-leaders.

CHAPTER V

CONCLUSION, DISSCUSSION, AND IMPLICATIONS

Introduction

This chapter is dedicated to the conclusions, implications, and recommendations of the findings. This study investigated the lived experiences of 4-H STEM State Specialists through phenomenological methods. These 4-H State Specialists are actively marketing and promoting STEM curriculum, programs, and events as part of their job responsibility. The purpose of this study was to understand and find strategies of marketing STEM through the experiences of the 4-H State STEM Specialists.

Overview of the Study

This was a qualitative study, to analyze marketing strategies of 4-H State STEM Specialists. I adopted a phenomenological research design to achieve the objectives of the study. Open-ended qualitative interviews were conducted with nine 4-H State STEM Specialist which met the criteria selected. The interviews were conducted at the NEA4-HA annual conference and tape-recorded, then transcribed, and analyzed. Themes that emerged from the data were triangulated to ensure validity with literature and digital media. The trustworthiness of the data was assured through triangulation and member-checking (Lincoln & Guba 1985).

Summary of the Data

Five themes emerged from the data collected from the participants. The findings were discussed in Chapter IV, which were:

Theme1: Develop and use relationships

Theme 2: Directly reaching audiences

Theme 3*:* Reduce fear and apprehension from gatekeepers

Theme 4: Make curriculum fun, unique, or creative

Theme 5: Consider potential missed markets

Summary of Results

The data within this study relied heavily on participant interviews to develop emerging themes. The five emerging themes that emerged from this study were described in detail in Chapter IV. These themes revealed a deeper understanding of the strategies used by the 4-H State STEM Specialist. The results should be interpreted as relevant to the context and population. It is essential to reiterate the themes and patterns only apply to the participant and their specific context, but the information can frame the readers understanding.

The Essence of Lived Experiences

The essence of the lived experience would best be described as if it is not broken don't fix it. The marketing strategies chosen by the participants are often tactics that feel safe and have been previously used. 4-H STEM Specialists have yet to spend the resources to find the most effective marketing strategies, but use resources available to them. Participants do not approach STEM as a product which needs to be marketed. Only using previous methods of marketing and

do not want to step out of their comfort zone to explore new marketing options mostly because these new efforts could prove to be ineffective.

Theme 1: *Use and develop relationships*

At the time of this study, 4-H State STEM Specialists speak volumes to relationships as a marketing tool. Relationships serve as a broad base and resource for 4-H State Specialists in their marketing efforts. This central theme expresses the power of human connections and working values of relationships. Participants explicitly stated that the power of relationships is of high priority to 4-H State STEM Specialist. A commonly reported feeling their networking abilities impact their career and STEM programs. Relationships are centered on the participant's skills to be: good listeners, being approachable, and respect others. Suggesting that the participants believed that positive personal relationships with 4-H educators are essential.

Conclusions

4-H State STEM Specialists relationships are an essential element of marketing. Similarly, to this study research from Gould-Williams (2007) showed negative relationships: increase stress, reduced motivation, and increased employee attrition whereas positive relationships contribute to positive attitudes and an increase in work-related activities benefiting an organization. According to research, reasonable working relationships are critical to the success of 4-H STEM programs. Data indicate that interactions with professional colleagues are essential to the success of STEM programs. Also, 4-H STEM State Specialists need guidance when choosing marketing strategies. An important note, participants recognize the importance of communicating through relationships and its part in being essential for effective marketing within the 4-H organization.

Implications

Participants have reported a positive correlation between their ability to market and using their relationship. Meaning steps should be taken towards providing positive networking opportunities for educators, volunteers, 4-H State STEM Specialist, members, and teen-leaders. There is a need for interested 4-H STEM State Specialists to become directly involved by sponsoring STEM activities with educational partners to network and build relationships with youth, volunteers, educators interested in STEM activities. The functionalities provided by these relationships will ultimately help youth become engaged with the 4-H organization. Relationships can be leveraged for these primary practices: identifying target audiences, listening to stakeholders, determining resources needed by educators, and developing working relations.

Recommendations

This study begins to reveal the educational potential--and pitfalls--of effective marketing strategies for STEM educational programs. Unanswered questions have been exposed such as the connection between professional relationships and their effectiveness. Given the complex construct of relationships, continued research should be conducted to unravel and improve these relationships throughout the 4-H organization.

Further research needs to access 'relationships' between 4-H State STEM Specialists and volunteers, educators, and teen-leaders and their overall importance. It has become evident to me; positive relationships are essential to the success of 4-H STEM programs. However, to what degree do relationships between 4-H State STEM Specialists and volunteers, educators, and teen-leaders influence youths' level of participation? Lastly, do relationships with 4-H educators need to be fostered through direct contact with the 4-H State STEM specialist?

Theme 2: *Directly reaching audiences*

The theme of directly reaching audiences is an essential part of the participants' lived experiences. Digital media has impacted the 4-H STEM Specialists and their ability to reach audiences with STEM programs directly. Tools to do this include Facebook, Twitter, Instagram, videos, Pinterest, state 4-H websites, Listservs, Facebook groups, and digital chat groups (Zoom). Directly reaching audiences create a sense of closeness and connectivity with audiences commonly participants' feel digital technology is an inescapable tool. With its increasing popularity, adapting marketing tactics to reach audiences is hugely useful.

Frequently, in an attempt to 'reach' large audiences with digital content, the 4-H STEM State Specialists overlooked marketing to audiences, which they have previously built relationships and want STEM information. The respondent's marketing interactions with digital mediums had increased participation and recognition of STEM educational programs by using these channels to direct marketing to audiences.

Conclusions

Participants' report digital mediums directly reach audiences who are interested in STEM topics. This type of relationship marketing plays a crucial role in information delivery to critical key publics. The interaction between organizations and their stakeholders allow the 4-H organization to build their brand recognition (Vernuccio, 2014). Platforms are conducive to increasing and facilitating brand recognition through social media networks. Branding communication through social media is leveraged primarily by reaching opinion leaders, listening to members, and ensuring communication is reinforcing 4-H brand image (Vernuccio, 2014). Direct interaction offered through social media allows stakeholders to become directly involved in brand building (Vernuccio, 2014).

Each unique platform of digital media has a specific relationship between its subscribers and the preferred content and delivery. Undoubtedly, challenging the status quo is the deterioration of traditional media, which has caused a re-organization within the 4-H organizations and its marketing efforts. In today's social culture, social networking sites influence an individual's values, attitudes, beliefs, intentions, and behaviors (Lai, Zhu & Gong, 2015).

Implications

These findings have significant implications for 4-H STEM State Specialist, who overwhelming use Facebook, State 4-H Websites, and internal listservs. Divergence from traditional mediums poses a risk of potentially losing large audiences based by avoiding these marketing efforts. 4-H STEM State Specialists should attempt to find common ground between traditional and digital marketing.

Recommendations

Applied research can assist 4-H STEM State Specialists with marketing choices and actions. These actions might reveal insight into targeting key publics, improving communication tactics among various mediums and channels for communication directly with parents, families, and community members, and coordinating with other organizations or agencies. For practitioners, it is recommended to form a collaborative role with state 4-H Communications Specialists to assist in their marketing efforts. Further needs assessment and understanding of the public preferences for receiving information regarding STEM curriculum, programs, and events should be researched. Consider the influence of traditional and digital marketing and their targeted audiences and specifically market their STEM programs.

Theme 3: *Reduce fear and apprehension from gatekeepers*

As new STEM programming becomes available to 4-H educators, the participants often struggled to find cohesive marketing strategies and tactics. In a deliberate attempt to reduce fear and apprehension from gatekeepers' an in-service is typically held. In-services is a tactic to provide fundamental training for educators to ensure the competency of educators while addressing educators' fears. 4-H STEM Specialists found when reducing fear and apprehension from gatekeepers 4-H educators are often in need of grab and go kits, redesigned curriculum and resources. Ultimately, the goal of eliminating fear from 4-H educators is that a 4-H educator leaves comfortable enough to teach STEM programming to others within their county.

Conclusions

The following conclusions connect literature and what is known about the phenomenon. The participants have all experienced teaching in-services and found it beneficial to 4-H educators. Asserting Kolb's' ELT cycle positively impacts learning through the employed tactic of in-services (Kolb, 1984).

If 4-H State STEM Specialists desire to strengthen STEM programs and curriculum through experiential learning, attention should be given to curriculum and teaching approaches (Baker et al., 2016). While these methods have increased self-efficacy and decreased fear of content knowledge, the longevity and continuing success of the in-service's events depend on the effectiveness of in-services.

Implications

The future of STEM in the 4-H organization hinges on its ability to market educational programs to its members. State 4-H STEM Specialists should consider local 4-H conditions, environments of educators, and practices. Specifically, an in-service should provide a multi-

purpose opportunity for educators to learn new skills, must be broad in scope, and flexible to meet the diverse need and interest of multiple audiences.

Participants reported STEM topics increase 'fear' from 4-H educators, volunteers, and teen-leaders based on comments such as, "*They fear that they can't do, it appears that is one of the first that they say*" Participant 4. Meaning 4-H State STEM Specialists teaching in-services should consider the vulnerability and fear felt by 4-H educators feel when learning STEM topics.

Recommendations

I make the following recommendations to reduce fear from 4-H educators expand in-service events to digital formats when possible, asses the needs of educators, build new relationships, and foster old relationships. Increased attention has been devoted to STEM educational programming, strategic marketing tactics in both research and practice need to be expanded. Personnel should develop marketing plans, which serve the 4-H STEM educational system and create tactics to reduce fear from 4-H educators.

Theme 4: *Make curriculum fun, engaging, unique, or creative*

In an attempt to combat declining youth numbers, making creative fun, engaging, unique and creative curriculum is critical to attracting an increased number of youths. Participants' primary tactics include the infusion of STEM into non-STEM projects, using pop-culture topics, and fun activities. Creating a curriculum that is a new innovative method to reach a new audience and bring 4-H to a place of relevancy for youth. Re-naming curriculum and events to appeal to pop-culture can interest new youth audiences. Participants' agreed with curriculum with relevancy to youth will always be the easiest to promote. Culturally relevant curriculum for student learning can attract youth audience which might not have been interested in 4-H before.

Conclusions

The findings of this study provide evidence that creative curriculum increases youth attention and interest, as compared to traditional instructional methods. Perhaps the attraction to an innovative curriculum is connected to Kolb's (1984) concept of creativity and hands-on learning. This study confirmed, one approach to marketing is the ability to create a curriculum which allows youth to operate creatively at high levels of integration.

Implications

Besides demonstrating the strategies for marketing STEM, this study determined specific activities and programs, which the youth liked and disliked including new experiences, hands-on activities, and culturally relevant information. As described by participants' youth enjoyed hands-on materials, culturally relevant curriculum, and new experiences. The least enjoyed activities are lecture-based activities, 4-H State STEM Specialists should keep incorporating hands-on component into curriculum and activities. This finding holds important implications for the role the 4-H organization plays in educating youth. Creating curriculum with relevancy to youth is critical to marketing efforts in attracting primary and secondary audiences.

Recommendations

This study found that creative curriculum increases youths' interest in attending STEM events. 4-H State STEM Specialists should embrace pop-culture while maintaining both a highly directive and experiential learning environment, as this combination produces high youth interest and learning most effectively. I recommend curriculum design to continue to fit experiential or "learning by doing" approaches to learning.

Theme 5: *Consider potential missed markets*

I identified themes from missing data of the participant's narratives. Missing data from participant's narratives represent an underwhelming amount of marketing efforts to reach diverse audiences. The exclusion of these audiences and marketing strategies ultimately hinder the 4-H organization ability to increase youth participation.

The vast amount of digital data collected through Facebook and 4-H State Websites failed to represent their actual membership demographics adequately; a higher percentage of images contain underrepresented audiences. Based on state demographics and ES-237's reports from participants states, I found that a majority of 4-H membership does not meet state demographic equivalents.

Images marketed to the public do not accurately represent 4-H membership in the states included in this study. Pictures found on numerous 4-H State Websites were available for download on the 4-H National Website as marketing materials. Further investigation found data from each participants' state found programming, which did not appeal to diverse audiences, because they are not culturally relevant to underrepresented audiences. These programs mainly targeted white rural audiences and lacked the appeal to reach underrepresented audiences.

Conclusions

The challenge of marketing to underserved audiences is well recognized within the 4-H organization and can be eliminated. However, it will require time, money, and effort on the part of the 4-H organization and its members, staff, and volunteers. Organized, initiatives and culturally relevant programs need cultural champions, culturally specific applications, and providing a link to science in the 'real-world' to engage youth.

It is predicted by 2050; no single or ethnic race will be recognized within the U.S., therefore failing to include cultural groups into 4-H populations, will be detrimental to the 4-H organization (Crayton, 2018). Expanding outreach to underrepresented audiences through schools, community groups, and places of worship could potentially increase participation. These programs can be implemented; 4-H will see an influx of diverse audiences.

Implications

The 4-H organization is committed to all youth and their learning. At the time of this research, none of the participants' reported or posted specific STEM programming marketed to a culturally diverse audience according to the criteria set by Zeigler (2015). This study has reported that 4-H programs are not fulfilling the needs of growing diverse populations based on ES-237 reports. This phenomenological study's findings show a need for improved 4-H STEM programs by considering minority perceptions when determining the needs of minority youth. The study has demonstrated, and increased effort is needed to reach youth regardless of their experience within the 4-H organization. America is considered the melting pot for diversity and cultural exchange, then 4-H youth programs should reflect this and encourage this by actively encouraging underrepresented youth to participate within the 4-H organization. Maker programs are open and reach a great diversity of people their pursuits and motivations (Dougherty, 2012). Additionally, programs like computer science and robotics suffer from low enrollment from underrepresented audiences (Bruckman et al., 2009).

Recommendations

This study only begins to expose the educational pitfalls of the 4-H organization such as the lack of direct marketing to underrepresented markets. It is reasonable to infer diverse parents want their children to understand STEM education to prepare for secondary education - what causes a lack of various youth participant? It is recommended that 4-H State STEM Specialists

analyze underrepresented audiences in their state and build relationships with cultural champions and stakeholder. Respected cultural members of communities attract underrepresented audiences an add a sense of relevancy to STEM programs (Zeigler, 2015).

Discussion

The discussion section is dedicated to the overall conclusions drawn from the results. This study found, shared experiences of 4-H State STEM Specialists and their marketing strategies. Overall, the attitudes and perceptions of the participants in this sample show they are using multiple marketing tactics. The practical strategies emerging from data analysis are, eliminate fear and apprehension from gatekeepers, directly reach audiences, develop and use relationships, and make curriculum fun, unique, or creative, and consider missed markets. Developing and using relationships is the central theme of this research study. Relationship marketing is a theme, which is incorporated throughout the research study.

Participants commonly shared a marketing strategy is to eliminate fear from 4-H educators. 4-H State STEM Specialist, held in-services to eliminate and reduce fear from educators. This marketing strategy held because the participants felt when educators had hands-on trainings programs were taught in higher frequencies and lasted several years. Answering with comments like, "*When they come in, and they do training with us, that is where they get them more hands-on experience in a safe environment, then they feel more confident of doing it by themselves in their own County, and we've got to provide a safe environment for them*" (Participant 9). The findings from this research revealed insight into the marketing tactics of 4-H State STEM Specialist like directly reach audiences. Participant data identified popular STEM programs throughout various states. Participants explained, hands-on activities, unique, or creative programs are popular with youth.

The 4-H State STEM Specialists in this study shared their experiences of the importance of marketing to their STEM programs. However, with the lack of STEM marketing plans available for the participants' in the 4-H organization, tactics focus on reducing fear and directly reaching audiences are the most successful and cost-effective ways of marketing STEM. These four marketing strategies previously mentioned are relatively easy to implement and require no cost to the 4-H program.

The theme consider *potential missed markets* speaks to the of the importance of reaching audiences broader than those 4-H State STEM Specialist are reaching. However, implementing the tactics found within this study could increase the reach of the 4-H organization of missed markets.

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APPENDICES

APPENDIX A: IRB Approval

Oklahoma State University Institutional Review Board

Date:	09/12/2018
Application Number:	AG-18-43
Proposal Title:	EFFECTIVELY MARKETING STEM FOR 4-H AUDIENCES
Principal Investigator:	Haley Kinney
Co-Investigator(s):	
Faculty Adviser:	JEFF SALLEE
Project Coordinator:	
Research Assistant(s):	
Processed as:	Exempt

Status Recommended by Reviewer(s): Approved

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

The final versions of any recruitment, consent and assent documents bearing the IRB approval stamp are available for download from IRBManager. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be approved by the IRB. Protocol modifications requiring approval may include changes to the title, PI, adviser, other research personnel, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms.
2. Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3. Report any unanticipated and/or adverse events to the IRB Office promptly.
4. Notify the IRB office when your research project is complete or when you are no longer affiliated with Oklahoma State University.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact the IRB Office at 223 Scott Hall (phone: 405-744-3377, irb@okstate.edu).

Sincerely,

Hugh Crethar, Chair Institutional Review Board

APPENDIX B: Participant Recommendations

Dear Jennifer Robertson-Honecker,

I am writing in regards to a study titled, Effectively Marketing STEM to 4-H Audiences, which is being conducted by Haley Kinney at Oklahoma State University with the supervising advisor of Jeff Sallee Ph.D. This study aims to identify the challenges and eases of marketing 4-H STEM curriculum in the United States. The ultimate goal of this study is to identify strategies to ensure educators have the tools to reach the maximum amount of youth.

As the chair of the STEM Taskforce, you were identified by Jeff Sallee Ph.D. to recommend 20 participants for this study. Participants in this study are preferred to be STEM educators within 4-H, five per region as defined by NEA4-HA and two years' minimal experience. Interviews will be conducted during at NAE4-HA conference in Columbus, Ohio and last between 30-45 minutes at participants convince. **Participants selected for this study are not required to participate.**

If you would be able to assist in recommending twenty participants who would be willing to take part in this study, please let me know.

Thanks, Haley!

Approved: 09/12/2018
Protocol #: AG-18-43

APPENDIX C: Recruitment Email Script

Participant,

Thank you for agreeing to participate in a study titled Effectively Marketing STEM for 4-H Audiences. I understand NAE4-HA annual conference is a hectic time. I have created a Calendly an online scheduler, which allows you to schedule an interview time of your convince. Time allotted for each interview is set at an hour this does not mean interviews will last the full hour. To schedule a time please click below.

https://calendly.com/hakinne/a-study-to-effectively-market-stem-to-4-h-audiences/10-07-2018

Thank you very much for your time and participation.

Haley

Approved: 09/12/2018
Protocol #: AG-18-43

APPENDIX D: Consent Form

ADULT CONSENT FORM

OKLAHOMA STATE UNIVERSITY

PROJECT TITLE: EFFECTIVELY MARKETING STEM FOR 4-H AUDIENCES
INVESTIGATORS: Haley Kinney
PURPOSE: This study is to address the challenges of teaching STEM across the United States researchers must systematically identify specific challenges as identified by STEM state coordinators. This study aims to identify the challenges of marketing 4-H STEM programs in the United States.
PROCEDURES: Interviews will be conducted with STEM educators in Columbus, Ohio at NAE4-HA annual conference. The location of the interviews will be in the lobby of the Hyatt Regency where the conference is held. Interviews will approximately last between 30-45 minutes and contain 13 questions. Participants will be recorded and information will be transcribed coded names will be provided to ensure no identities are protected. Participants will have the option to discontinue the interview at any point.
RISKS OF PARTICIPATION: There are no known risks associated with this project, which are greater than those ordinarily encountered in daily life.
BENEFITS OF PARTICIPATION: Oklahoma 4-H will be able to utilize information collected to determine how to effectively market and promote STEM. By providing an effectively marketing STEM to 4-H educators and leaders, access to easily accessible information and familiarity regarding the marketing strategies of STEM. The goal is to ensure more youth are impacted by STEM programing.
CONFIDENTIALITY: Research transcripts will be stored on a password protected computer in a locked office and only researchers and advisor will have access. All responses and answers are confidential and will be kept private and you will be assigned pseudonym. Interview responses are confidential and will only be used to identify how to effectively market and promote STEM.
COMPENSATION: Unfortunately, no reimbursement will be provided for the participating in this study.
CONTACTS: You may contact any of the researchers at the following addresses and phone numbers, should you desire to discuss your participation in the study and/or request information about the results of the study: Haley Kinney, Dept. of Agricultural Education Communications and Leadership Oklahoma State University, Stillwater, OK 74078. If you have questions about your rights as a research volunteer, you may contact the IRB Office at 223 Scott Hall, Stillwater, OK 74078, 405-744-3377 or irb@okstate.edu
PARTICIPANT RIGHTS :I understand that my participation is voluntary, there is no penalty for refusal to participate, I am free to withdraw my consent and participation in this project at any time, without penalty.
CONSENT DOCUMENTATION: I have been fully informed about the procedures listed here. I am aware of what I will be asked to do and of the benefits of my participation. I also understand the following statements: I affirm that I am 18 years of age or older. I have read and fully understand this consent form. I sign it freely and voluntarily. A copy of this form will be given to me. I hereby give permission for my participation in this study.

_____ _____
Signature of Participant Date

I certify that I have personally explained this document before requesting that the participant sign it.

_____
Signature of Researcher

Approved: 09/12/2018
Protocol #: AG-18-43

VITA

Haley Marie Kinney

Candidate for the Degree of

Master of Science

Thesis: A PHENOMENOLOGICAL STUDY OF INDIVIDUAL STRATEGIES FOR MARKETING STEM TO 4-H AUDIENCES AS TOLD THROUGH THE LIVED EXPERIENCES OF 4-H STATE STEM SPECIALISTS

Major Field: Agricultural Education

Biographical:

Education:

Completed the requirements for a Master of Science in Agricultural Communications at Oklahoma State University, Stillwater, Oklahoma in 2019.

Completed the requirements for a Bachelor of Science in Agricultural Media and Communications at West Texas A&M University, Canyon, Texas in 2017.

Completed the requirements for an Associates of Science in Animal Science at Clarendon Community College, Clarendon, Texas in 2015.

Experience:

Graduate Research Associate, 4-H Youth Development, August 2017– May 2019