Identifying Roadblocks and Improving Strategies to Foster New Media Technology Adoption in Extension

by

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B.S., Fort Hays State University, 2016

A THESIS

submitted in partial fulfillment of the requirements for the degree

MASTER OF SCIENCE

Department of Communications and Agricultural Education
College of Agriculture

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2019

Approved by:

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Abstract

Extension agents have been educating and serving their clientele for over 100 years. As the years have come and gone, advancements in agriculture and technology have grown immensely. With these developments, education and communication have come to the forefront of extension. New media technology, a result of technology advancements, has the potential to positively influence the way extension agents communicate and educate their targeted audience. However, new media technology adoption in extension has been a slow and tedious process. The purpose of this qualitative study was to examine Kansas extension agents' use of new media technology and their decision process behind adopting or rejecting the use of new media technology, while also identifying potential roadblocks preventing adoption. This study was guided by three separate theories: diffusion of innovations, the theory-in-use model, and the model of strategic learning. The three theories were incorporated into a holistic model of technology adoption and used to guide the research. The initial participants for the study, Kansas agricultural extension agents, were recruited using a purposive sampling method through extension contacts. A quantitative survey was sent to all 98 Kansas agricultural extension agents and was used as a tool to identify agents to participate in semi-structured interviews. Based on participants' survey responses, individuals were sorted into four groups of new media technology users (non, low, medium and high). Nine individuals were selected to participate in the qualitative semi-structured interviews. Participants were randomly selected for the low and medium user groups (the non-users and high user groups did not have enough participants for random selection). Interviews were transcribed by the researcher using the direct content analysis approach. The major themes that were discovered when it came to facilitation of new media technology in this study included: The

relationship between relative advantage, compatibility, focusing and aligning; The relationship between complexity, trialability, observability and learning; The relationship between executing and Argyris and Schon's model. While all Kansas agricultural extension agents agreed that the use of new media technologies was imperative to stay relevant, they were not equally eager to adopt the technologies. Identified roadblocks to the adoption of new media technology included: time, personal attitude, efficiency of communication, inconsistencies in new media technologies, and ethics. This study offers possible solutions for overcoming the identified barriers to implementing new media technology and also proposes a new holistic approach to technology adoption.

Keywords: Kansas agriculture extension, new media technology, technology adoption, technology adoption barriers, diffusion of innovations, communication, model of strategic learning, theory-in-use model.

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Acknowledgements

It is crazy to think how fast two years can fly by. It seems like just yesterday I was sitting in Dr. Ellis's office thinking what I have got myself into. He told me "It will be over before you know it," he was not kidding. As this chapter of my life comes to an end, I reflect on the amazing opportunities and people that have been a part of my life through this process.

I would like to first start by thanking Dr. Jason Ellis my major professor. You have been amazing throughout this entire process and I could have not asked for a better mentor. I am so thankful for the countless trips to tropical climates and the numerous opportunities to learn not only about agricultural communications but also agricultural practices not common in Kansas. I have never met a human who used analogies as much as you, but I appreciate them more than you know, it always made learning complex theories and concepts a little less daunting.

I would also like to thank my committee chair members, Dr. Jon Ulmer and Dr. Robert Weaber. Thank you for taking the time to provide me with your wisdom, patience and guidance through my master's process. It means so much to me that you both took the time to be a part of such an important moment in my life.

Finally, I would like to thank my parents Tom and Scarlett Tully. Without your relentless love and support I could have never made it this far. You both believed in me when I wasn't able believe in myself. I can never thank you enough for encouraging me to take that first step and telling me it would all work out in the end. Thank you for the countless pep talks and words of encouragement. Thank you for both being amazing role models and showing me that hard work and being true to yourself, although not always easy, pays off.

Chapter 1 - Introduction

Overview of the problem

This study seeks to shift the research field's focus from roadblocks preventing the implementation of social media in agricultural extension, to what roadblocks are preventing the implementation of new media technologies in the professional field. As extension agents continue to disseminate important information to producers, it is vital to use not just social media but also new media technology as an avenue for education. The study also looks at what can be done to overcome the roadblocks in order to establish a better presence of the use of new media technology in extension to better assist their clientele. In news coverage and academic scholastics, terms used when discussing new media technology vary by context. For the purpose of this study, new media technology is defined as an all-inclusive communication technology; new media technology encompasses a wide variety of web-related communication technologies, such as blogs, wikis, online social networking, virtual worlds and other social media forms (Friedman & Friedman, 2008). All of these terms are included under the term new media technology.

Introduction

Agriculture extension began in the early 1900s with the passage of the Smith-Lever Act, which created a cooperative extension program linked to land-grant universities (Gould, Woodrum & Steele, 2014). The founders of agricultural extension quickly realized that if they wanted to stay relevant and be sustainable, they would have to cater to a broader audience in order to influence the rural society (Gould, Woodrum & Steele, 2014). Many individuals relied on the expertise and assistance of extension agents to keep them informed on crop diseases,

livestock diseases, food preparation, homemaking and many more topics in the realm of agriculture. Extension was a lifeline between individuals and the agriculture research and knowledge at the universities.

The overall role of extension is essentially the same one hundred years later; extension agents are the communicators/educators who disseminate information to individuals about the new research and information being explored at the land grant institutions. However, the situation differs immensely from a century ago. Through the years, more and more individuals have moved away from agriculture. Now, less than two percent of the population is directly involved in agriculture (USDA, 2012). This creates a divide between the industry and consumers. According to the Kansas City, Mo.-based Center for Food Integrity, there is a dangerous trust deficit that breeds increased public skepticism and highlights the need for increased consumer engagement by the food system ("Survey shows trust," 2018). Agriculture extension plays an essential role in bridging the gap of trust between producers and consumers by providing producers with the right tools and knowledge to better produce what the consumers want. The new challenge facing extension is staying relevant through the use of new media technology and being able to reach a vast and diverse group of producers while still catering to individual needs.

Through the years, the concept of education has expanded and evolved, just as extension education has. Education began in the traditional classroom setting, moved to the digital age of computers, and now has progressed into new media technology (Shipla, 2014). The expansion of technological advancements in the 20th century has permitted access to an abundant amount of information and data readily available, pushing the boundaries of traditional education delivery systems (Shipla, 2014). These new technologies have created opportunities for extension

educators to disseminate information more quickly and effectively. However, this increased access to information has created a new set of roadblocks for extension agents (Guenthner & Swan, 2011). Funding and staffing cuts seem to be a persistent problem, and when coupled with increasing workloads, time constraints, and learning new technologies to enhance extension, many agents are reluctant to take on the added stress (Kinsey, 2010). Short lifespans of technologies, ideological generational divides and technology issues can be barriers too preventing the adoption of new technologies (Seger, 2011). Time, money spent on training and technologies also can be roadblocks to new media technology adoption (Diem, Gamble, Hino, Martin & Meisenbach, 2009). Previous studies have looked at the broader use of social media and the associated roadblocks that follow, but they have not explored the use of new media technology and the roadblocks that arise when implementing them within the agricultural extension system.

While there are many foreseen roadblocks similar to those identified in social media implementation and there are a number of reasons why implementing new technologies is no easy task, the advantages to agriculture extension can be beneficial. Most generations are now using the internet and rely on it for much of their informational needs. The Pew Research Center found that 88% of 18-to-29-year-olds, 78% of 30-to-49-year-olds, 64% of 50-to-64-year-olds, and 37% of Americans 65 and older use some form of social media on a regular basis (Smith & Anderson, 2018). With a growing younger generation becoming the new clientele, agents must find a way to cater to multiple generations at once while also keeping within their resources. The use of new media technology would allow agents to interact with more individuals, disseminate more information to a larger population of clientele, reach a broader range of clientele, and

potentially save money and time through the use of virtual meetings, virtual documents (flyers, invites, pamphlets) and more (Toelle & Harris, 2014).

Guiding Theory

There are multiple theories that will guide this study, with the primary one being Everett Rogers' diffusion of innovations theory. Rogers' (2003) theory explains how an innovation or technology diffuses through a society over time. Adoption of an innovation requires a set of circumstances to take place prior to acceptance of a new technology (Rogers, 2003). Individuals in a society do not simultaneously accept or refuse an innovation; depending on their role in the adoption of a technology, individuals are categorized as innovators, early adopters, early majority, late majority, or laggards (Rogers, 2003).

The second theory used to guide this research is Argyris and Schon's theory-in-use model. Argyris and Schon's theory offers a framework for understanding resistance to the adoption of a digital mindset (Murdoch & Fichter, 2017). In Argyris and Schon's (1974) *Theory in practice: Increasing professional effectiveness*, they introduce the notions of theory-in-use (our actual behavior) and espoused theory (how we think we behave). Reflecting on the differences between theory-in-use and the espoused theory allows learners within organizations to evolve. This theory is an extension of the diffusion of innovations and addresses the linear limitations of the diffusion of innovations theory.

The third and last theory used to guide this research is Willie Pietersen's (2010) model of strategic learning. Pietersen's model explores the role of strategy and the power of adaptability (Pietersen, 2010). Pietersen looks at how the right strategy can provide organizations with the appropriate tools to be adaptable. Pietersen's model encompasses five competencies (insight, focus, alignment, execution and renewal) that allow for the continuation of the capacity to be

adoptive (Pietersen, 2010). The model of strategic learning will help to not only further the diffusion of innovations by creating a built-in process for continuous reevaluation but also provide insight into the challenges of learning and change.

Significance of the Study

This study will help to provide extension agents with information pertaining to the use of new media technology that can be used to disseminate information to their client base more efficiently, as well as be able to provide a wider range of producers' access to more information. The research will identify major roadblocks that are preventing the use of new media technology in Kansas agricultural extension. More specifically, the study will examine extension agents' current use and implementation of new media technology and identify barriers as well as ways to overcome them and implement new media technology in everyday extension use. In doing so, this study will seek out individuals who have overcome these roadblocks to identify positive, realistic solutions to being able to successfully implement new media technology within an extension setting. Conversely, the study will also identify individuals who are struggling to implement new media technology and identify what they convey to be their biggest hindrances.

This study will benefit agricultural extension because it will help facilitate agents reaching more people in a shorter amount of time while saving money by utilizing new media technologies. This study also has the potential to help all individuals affiliated with extension. By using new media technology to disseminate information, producers will have better access to information in a quicker, more accessible manner.

Purpose of the Study and Research Questions

The purpose of this study was to find effective and realistic means to overcoming roadblocks that prevent the use of new media technology as a tool for disseminating information

in extension. For the purpose of this study, effective technologies are defined as new media technologies that the agents can successfully implement and disseminate information through to the clients, and the clients are able to have better access to and learn effectively from the new forms of technology. Realistic means to implementing new media technology consists of easy, time-efficient training for the agents to learn how to properly use the new media technology, cost-efficient new media technologies, and technologies that clients will have easy access to. This qualitative study was exploratory and descriptive and provided an increased understanding of how Kansas extension agents could realistically and effectively implement new media technology in their roles as agents.

The study investigated the following research questions:

- RQ 1: What elements foster adoption of new media technology in agricultural extension by Kansas agents?
- RQ 2: What roadblocks prevent the implementation of new media technology use in agricultural extension?
- RQ 3: Why do Kansas agricultural extension agents continue to use new media technology in agricultural extension?

Chapter 2 - Review of Literature

Introduction

In the United States, less than two percent of the population is directly engaged in agriculture (USDA, 2012); however, the entire U.S. population relies on some sort of agricultural product on a daily basis. With agriculture being intertwined into so many different industries, one might assume that public opinion is in favor of the agriculture industry, in the sense that the industry produces products that every individual uses on a daily basis. Conversely, the vast gap between the minority of the population directly involved in the industry and the majority of individuals who lack an understanding of agricultural practices creates a disengagement of the general public and leads to a level of distrust (Woolpert, 2015). This is where the role of the extension agent and the need for dispersing information comes into action. The title of extension agent comes with multiple "hats" so to speak: educator, communicator, researcher, coordinator, and more (Conglose, 2000). Agents help to educate all social, racial, and economic backgrounds on all aspects pertaining to agriculture, through numerous traditional and nontraditional settings (Oakley & Garforth, 1985).

The following chapter will look at the current literature available to help develop the research questions. First, the extension agents and individuals they serve will be examined to look at how the current trends of extension may or may not be best suited for meeting the needs of their clientele. Then, literature focusing on the theories and how they have been applied to new media technology and agricultural extension will be examined. Finally, the major theories used to guide this research will be described and assessed.

Audiences

Farmers as clients. As technology has changed over time, so has the "farmer." Since 1900, the number of farms has fallen by 63 percent, while the average farm size has risen 67 percent (Dimitri, Effland & Conklin, 2005). This consolidation of farms is coupled with advances in technology (Dimitri, Effland & Conklin, 2005). Technological advances in machinery are not the only advancements changing the way farmers practice agriculture. Media technology advancements have now made consumers more affluent and curious than ever when it comes to how their food is being produced; they are wanting products that meet convenience, ethnic, and health-based preferences (Dimitri, Effland & Conklin, 2005). As consumers turn toward new media technology for their food information, it is important for farmers and agents to understand the importance of new media technology as a way of not only obtaining information, but also disseminating information. With that being said, it is important to note that the average age of the farmer is increasing. Among principal operators, 6 percent are under 35 years old, 61 percent are 35 to 64 years, and 33 percent are 65 and older (USDA, 2012). According to the Pew Research Center, young adults were among the earliest and highest users of social media, but usage by older adults has increased in recent years (Jiang, 2018). More than nine-in-ten Millennials (92%) own smartphones, compared with 85% of Gen Xers (those born between 1965 and 1980), 67% of Baby Boomers (those born between 1946 and 1964) and 30% of the Silent Generation (those born between 1928 and 1945) (Jiang, 2018). All generations are utilizing the benefits of new media technology to some degree. Agriculture is no longer a simple way of life. As agriculture continues to lead the way in science and technology, it is vital that extension stays significant in order to provide relevant information to the farmers that allows the industry to continue to grow and prosper.

Kansas extension agents. Over the years, extension has become a generic term to notate a copious amount of systems and providers that have come about while communicating an abundance of information, technology and techniques to farmers and individuals in rural locations (Rivera & Sulaiman, 2009). Extension agents play a role in educating the public and the methods in which they do so vary immensely based on the county, agent, material being communicated, and clientele being served (Gibson, 1992). There are many types of extension agents who specialize in areas such as horticulture, livestock, 4-H, and more (Gibson, 1992). Just as agriculture has expanded and grown over the years, so has the role of extension; the emphasis has grown from agriculture production and assisting farmers in the fields, to now helping farmers go digital (Swanson, 2006; Shepherd, 2007). While agriculture and the material covered has changed, extension's primary role is still education.

Agents. In the last decade, technology has grown and become integrated in almost every aspect of an individual's life. Technology is used for communication, entertainment, business, education, and more. With information dissemination being at the core of extension, it is vital for agents to embrace technology and use it to their advantage, for not only individuals learning the content, but also for all that technology can provide for the extension learning environment (Woods & Langcuster, 2014). Kinsey (2010), identifies five social media tools: blogs, Wikis podcasts, Facebook and YouTube, which could greatly enhance extension services and the learning environment for clients. Kinsey (2010) also iterates the importance of expanding on these five tools and implementing tools such as free online services and engaging individuals in asynchronous learning. These technologies allow for the widest outreach possible for the time extension agents have available. Technology has advanced so quickly that the concern of a digital divide between individuals who had access to technology and those who did not has gone

mute in the past five years because the majority of individuals do in fact have access to a computer (Kudryavtsev, Krasny, Ferenz & Babcock, 2007). This concern has nearly eradicated itself, as computer access is no longer a problem in low-income communities and newer concerns have emerged such as the speed and cost of internet (Kudryavtsev, Krasny, Ferenz & Babcock, 2007).

With such a wide acceptance and growth of new media technology, the need for implementing it into daily use in extension is growing in order to be able to keep up with the growing demands of clients. While research identifying roadblocks to implementing new media technology in extension is lacking, there have been studies that examined the roadblocks preventing the use of social media in extension. The lack of control over content and the amount of time allotted to keep pages up-to-date were leading barriers in Wisconsin and New York extension (Newbury, Humphreys & Fuess, 2014). Ill-prepared organizational structure for short turnaround technologies, ideological generational divides and general technology issues were main barriers for Ohio State University Extension (Seger, 2011). While roadblocks varied from state to state and were numerous, realistic solutions for overcoming the barriers were limited. Trainings and education were noted as the very few viable solutions to tackling encountered roadblocks (Newbury, Humphreys & Fuess; 2014, Segar, 2011).

While new media technology has existed for several years, relevant research in the context of extension is lacking. Social media use has been covered most extensively within the realm of new media technology and leads the way for future research. For extension to stay relevant, continue to cater to the needs of its clients, and further the agriculture industry, it is imperative that extension adopt the use of new media technology and implement it in their day-

to-day functions. As once stated by Ezell (1989), “The future of extension is the sum of several independent innovations coming together”

Social media led to the creation of what is known as new media technology. New media technology is diversely defined and relatively new; little research has been done on individuals’ engagement with these platforms. However, one encompassing element of new media technology, social media, has been studied in-depth and can offer insight into individuals’ use of new media technology. Social media and new media technologies are both considered information and communication technologies (ICTs), and when correctly embedded in the agriculture industry, can provide improved communication, engagement, and a boost in productivity (Steinmuller, 2001). There is a growing number of farmers who now actively engage in social media for both personal and business use (Walter, 2017). This growing trend of farmers going digital has peaked at 70 percent of farmers acknowledging they go online at least once a day, and 28 percent of those farmers are online multiple times a day (Miller, 2017). Farmers cited YouTube as being their top social media channel, with 51 percent of farmers being active on this platform. Facebook came in second at 34 percent, Pinterest third at 9 percent and Twitter was last with 8 percent of farmers active on the platform (Miller, 2017). Farmers are not just using social media for personal use but are now invested in it for obtaining general news and information to improve their operations (Walter, 2017). Agricultural businesses are also employing social media to engage with the growing number of farmers on social media. Connections made through social media can help businesses promote their brand and products to farmers. Live updates on events like field days, farm tours, trade shows, and conferences are great ways to make connections with farmers in a fast and inexpensive way (Martin, 2017). Not only are farmers and business professionals utilizing social media, but so are extension agents. In

order to stay relevant to the clientele they are reaching, extension agents in the United States can use social media applications to reach the growing population of farmers going digital (Gharis, Bardon, Evans, Hubbard, & Taylor, 2014).

Education

History of education. In the United States, the first form of a public education can be dated back to the 1600s in the New England colonies of Massachusetts, Connecticut and New Hampshire (Thattai, 2011). Up until the 1840s, education was still rather selective and catered toward the wealthier class of individuals (Thattai, 2011). Since this time period, the educational system has made major improvements to inclusion, regulations, and overall quality of education. Through the years, the concept of education has expanded and diversified vastly, similar to that of the information extension disseminates. With such an immense spread and accessibility to education, multiple avenues have come available for individuals of all backgrounds and ages to receive an education. For individuals trying to gain knowledge to better themselves from a social, civic, or occupational standpoint, they can pursue one of three methods: formal, non-formal, or informal education.

Non-formal education, while still structured, is not enforced by the government nor a linear curriculum, as in formal education (Dawson, 1998). Non-formal education is the deliberate action of an individual to gain more knowledge or experience for personal gain (Dawson, 1998). Non-formal education, like formal education, is comprised of organized systematic education. However, it can be administered not only by educational systems but also agencies or organizations (Dawson, 1998). Education in a non-formal setting is more need-based and can be considered an alternative training that often includes education in the form of professional development, workshops, seminars or community education initiatives, amongst many others

(Schwier & Seaton, 2012). The importance of non-formal education was revealed in a survey done by Richmond (1997), which showed practicing teachers gain much needed skills, knowledge, and experience through various non-formal education settings (Galbraith & Zelenak, 1991). This type of education plays a vital role in teaching through the process of need-based, life-experience training. Extension education is classified as non-formal education and designed to help individuals of all backgrounds gain knowledge pertaining to topics such as agriculture (Etling, 1993).

An element of non-formal education is informal education. Informal education can result from everyday situations and is not planned prior to the event nor organized by an external institution (La Belle, 1982). Informal education can arise from daily activities, work, leisure time, or time with family, and can either be understood or accidental, depending on the individuals' desire or need to learn the information (Petnuchova, 2012).

Regardless of formal, non-formal, or informal education, all learners participate in each form of education at some point throughout their lifetime. An adult attending college courses and a youth attending class in the 5th grade are both participating in formal education. A farmer attending a seminar on artificial insemination and a 4-H member attending a meeting on how to prepare a heifer for the fair are both participating in non-formal education. While both adults and youth are participating in the same form of education, they require different processes in order to be able to learn. These differences are characterized as andragogy and pedagogy (Malcom Knowles, 1973, 1980). Andragogy is "the art and science of helping adults learn" (Knowles, 1980, p. 38), while pedagogy is "the art and science of educating children" (Knowles, 1980, p. 38). For the purpose of this thesis, andragogy is the main focus.

Andragogy. Aside from 4-H, much of extension educates adult individuals on various subjects pertaining to agriculture. It is critical to understand how adults learn best, as well as to recognize what drives them to seek out knowledge or training. Malcom Knowles (1980), one of the leading scholars for andragogy, noted four assumptions for adult learners:

> (1) his self-concept moves form one of being a dependent personality toward one of being a self-directing human being; (2) he accumulates a growing reservoir of experience that becomes an increasing resource for learning; (3) his readiness to learn becomes oriented increasingly to the developmental tasks of his social role; and (4) his time perspective changes from one of postponed application of knowledge to immediacy of application, and accordingly his orientation toward learning shifts from one of subject-centeredness to one of problem-centeredness (p. 39).

Knowles' four assumptions indicate that adult learners want to know what they are learning, how this new knowledge will benefit them in the long run, and how they will be able to relate this new information to past knowledge and experience (Knowles, 1980). This andragogical model indicates that a separate teaching method is necessary to facilitate adult learners and allow them to utilize the new information (Deveci, 2007). While the role of an extension agent is primarily to educate, it is important to note that they should be viewed as a facilitator rather than a teacher (Oakley & Garforth, 1985).

Guiding Theories

Three theories were utilized to guide this study. The next section will go into more detail about each of the three theories, starting with the history of Rogers' diffusion of innovations, the base theory utilized in this study, proceeded by Argyris and Schon's theory-in-use model, and ending with Willie Pietersen's model of strategic learning.

Rogers' Diffusion of Innovations Theory

1960: Beginning and background of theory. The main theory guiding this research is Everett M. Rogers' diffusion of innovations theory. Everett Rogers developed the theory in 1962. Rogers' theory is one of the classic social science theories that explores how new technologies gain acceptance or adoption through a social system (Garcia & Calantone 2002). The theory acknowledges the progression of how new technologies are adopted and or rejected. Prior to Rogers' first publication of the *Diffusion of Innovations,* the study of diffusion was sweeping through Midwestern rural communities in the 1920s and 1930s (Valente & Rogers 1995). Researchers were particularly interested in how farmers were adopting and implementing new technologies, such as modified organisms or equipment (Valente & Rogers 1995). One robust study that highlighted the importance of the study of diffusion of innovations in agriculture, was a study done by Bryce Ryan and Neal Gross (1943). The study looked at how residents of two agricultural communities in Iowa adopted the use of hybrid corn (Ryan & Gross 1943). As the years progressed, the diffusion of innovations has grown and been adapted to countless other areas of study, including communications, marketing, medical field and more (Dooley, 1999 & Stuart, 2000).

Rogers' original 1962 theory focused on six disciplines that utilized diffusion of technology in some form; anthropology, early sociology, rural sociology, education, industrial and medical sociology (Rogers, 1962). In Rogers' (1962) theory, there are five phases to adopting an innovation: awareness, interest, evaluation, trial and adoption. Each of these phases is important to achieving adoption of technology; however, individuals at any point may choose to reject the innovation. Individuals may even reject the technology after the innovation has been implemented and in use, Rogers' referred to this as discontinuance (Rogers, 1962). No two

individuals are the same and neither are their rates for accepting technologies. Due to these differences in accepting technologies, five categories were created to accommodate all types of individuals: innovators, early adopters, early majority, late majority and laggards (Baldwin, Perry, & Moffitt, 2004). It is important to understand the audience and the roles of individuals when it comes to gaining acceptance for a technology. This importance derives from the impact that ability and motivation have on a person's decision to adopt an innovation; potential adopters that are more motivated to adopt an innovation are more likely to take the necessary steps for adoption (Ferlie, Gabbay, Fitzgerald, Locock, & Dopson, 2001).

1970s: Revising and growing the theory. In the 1970s, Rogers' theory began to spread and was applied not only to rural sociology, where the theory began, but to the medical field as well (Rogers & Scott, 1997). One study looked at specific factors that contributed to the adoption or rejection of innovations among health care providers (Becker, 1970). The study results were concurrent with Rogers' theory, in that the speed at which health providers adopted innovations was dependent upon different socio-economic factors (Becker, 1970). While the theory was advancing through new fields of study, its original rural sociology counterparts were finding weak spots in the theory that Rogers would continue to revise for the next decade. Through the 1960s, diffusion of innovations was a theory that brought about positive change through the diffusion of technology and innovations in societies that led to economic growth (Röling, Ascroft, & Chege, 1976). With advancements in agriculture, traditional farmers in isolated villages became a thing of the past and led to small landholders who had a lack of opportunity rather than resistance to change (Röling, Ascroft, & Chege, 1976). The way in which diffusion research was being done did not allow for the consideration of growth in technology and circumstances, but rather just reaffirmed existing practices. (Röling, Ascroft, & Chege, 1976).

Between the spread of the theory in new fields of study and the new-found limits of the theory, Rogers continued to grow and improve his theory through the years.

1980s: Further growth and use of the theory. Into the 1980s, Rogers saw criticism and growth in the study of diffusion of innovations. Rogers reacted to these changes and adjusted his model by revising the theoretical framework as well as the research evidence supporting it, and he also added new concepts and theoretical viewpoints. In Rogers' (1983) *Diffusion of Innovations Third Edition,* the model was used in a wider scope and understood that diffusion is only a small part of a much larger process that begins with a problem or need, and through research and the development of a possible solution, an entity deems the innovation useful. This process leads to the dissemination of the innovation with the possibility of consequences (Rogers, 1983). Rogers also notes that the theory reveals a much more critical stance and increased interest in the innovation process in organizations (Rogers, 1983). One study looked at the adoption of spreadsheet software through an organization (Brancheau & Wetherbe, 1990). The theory was chosen as the driving force for the study due to the fact that Rogers' theory, while developed outside of an organizational setting, is able to be applied within one (Brancheau & Wetherbe, 1990). The findings of the study supported Rogers' theory in that earlier adopters of spreadsheet software were younger, more highly educated, more attentive to mass media, and more likely to be opinion leaders (Brancheau & Wetherbe, 1990).

1990s: Continuation of the theory. The 1990s was a time of economic growth for the United States (Houseman, 1995). This growth was in part due to an increase in technological advances that benefited all realms of society (Houseman, 1995). Despite the fact that Rogers' theory started in the 1960s, when much of the technology of today was nonexistent, it still plays a vital role in explaining how new technologies are diffused over time through societies. Rogers

continued to keep his theory relevant with the changing times and updated his *Diffusion of Innovations* to its fourth edition. With the continuation of growth of the theory, its spread across studies continued to grow and expand (Dooley, 1999 & Stuart, 2000). In 1999, the theory was used for the first time in a study of the discontinuance of assistive technology for individuals with disabilities (Riemer-Reiss, 1999). This study looked at why individuals were doing away with their assistive technology devices and found that cost and benefit of the device to the client were driving factors (Riemer-Reiss, 1999). Another study, done two years prior, combined the "grass roots" of the diffusion of innovations theory with the growing technology of the medical field and looked at how rural communities would utilize a national network of medical libraries (Rogers & Scott, 1997). These libraries would give rural medical practitioners access to greater information in a quicker amount of time. Relying on the diffusion of innovations theory, the study indicated that they should target early adopters to secure a fast expansion and use of the medical libraries, and in turn other professionals would follow suit later (Rogers & Scott, 1997).

2000s: Progression of technology into social media and new media. When the 2000s came about, social media and new media technology improved many disciplines and the way in which they operated (Kane, Alavi, Labianca & Borgatti, 2012). This was no exception for agriculture. Many scholars looked to Rogers' theory for guidance on how to utilize this new technology and how to benefit and grow from it. In 2003, Rogers took into consideration criticisms of his theory and new advancements in the field and released the 5th edition of his book in order to stay relevant and up-to-date. In the newest edition, Rogers describes the innovation process as "an uncertainty reduction process" (Rogers, 2003, p.232). New media technology posed and still poses a lot of uncertainties, which makes individuals more on edge about adopting new methods and processes. This can be seen in extension (Seger, 2011). The need for

updating procedures exists; however, individuals are uncertain of the new technology and less likely to adopt the innovations. Rogers goes on to say, in order to develop faster adoption and dissemination of a technology, the theory needs to encompass more relative advantage, compatibility, simplicity, trialability, and observability (Rogers, 2003).

Figure 1. *Rogers' 5 phases to technology adoption*

When introducing a new technology to extension agents or clients, five attributes are cited for better success of not only the innovation but also the program as a whole (Figure 1). One study that looked at the adoption of distance education technologies, which can be compared to new media technologies, found that by using Rogers' five attributes, a revision of the policies, and coming up with a strategy will greatly enhance the likelihood of a faster rate of adoption (Murphey & Dooley, 2000). The results of this study indicate the importance of a good base plan and education of the technology prior to the first steps of implementing it, and how that can either set an innovation up for success or failure from the beginning (Murphey & Dooley, 2000).

Rogers' theory has been in existence for nearly 60 years and through studies like one done by Ma, Lee and Goh (2014), which explored news sharing through social media, proved the theory is just as relevant now as it was in 1962 (Ma, Sian Lee & Hoe-Lian Goh, 2014). As extension agents begin to utilize and integrate new technologies into their disciplines, it is important to keep in mind the teachings of Rogers in order to stay relevant and grow as an entity.

Limitations to the diffusion of innovations theory. While Rogers' diffusion of innovations theory is known worldwide and is a classic theory, it does have some limiting factors. One of the bigger limitations is that it is a linear approach to decision-making (Murdoch

& Fitcher, 2017). This linear approach implies that the role of technology adoption is a relatively linear, easy process with a set path (Murdoch & Fitcher, 2017). However, this is not the case as technology advances at such a high rate, the options for different technologies are endless and ever changing. This volume and speed of advanced, diversified technology does not allow for a linear approach to adoption. This leads into the next limitation of the theory. With such a vast array of technologies to choose from and their ability to encompass such diverse functions, Rogers' theory falls short of the ability to decipher between individuals' use of technology at work versus their use of technology for personal matters (Persico & Pozzi, 2014). Individuals come to have an idea of how technology should work for them in a professional setting, as well as in a private setting (Persico & Pozzi, 2014). These different views of technology can affect how individuals go about adopting a new technology (Watts, 2002). Rogers also acknowledged some limitations himself, pointing out that social norms and standards can greatly affect a society's decision to adopt an innovation (Rogers, 1962). Where Rogers' theory lacks, Argyris and Schon and Pietersen's theories are able to address the shortcomings of Rogers and create a stronger framework when looking at individuals' habits of technology adoption.

Argyris and Schon's Theory of Action

Argyris and Schon's (1974) theory of action looks at resistance to learning technology with a different perspective than Rogers. Argyris and Schon's model examines the execution of adoption, rather than adoption itself. Argyris and Schon's theory works when applied to new media technology, because it centers on the organizational defensive routines that counteract continuous learning, which is pertinent to implementing new technologies (Murdock & Fichter, 2017). The theory of action provides a frame for understanding why individuals resist or adopt a digital mindset and came about from combining two theories (Murdock & Fichter, 2017). The

espoused theory, the world view and values people base their behavior on, and the theory-in-use, the world views and values implied by their behavior, (Anderson 1994) are the basis for the theory of action. Argyris and Schon (1974) created two models to further explain their theory: the model of theory-in-use and single and double-loop learning. The theory-in-use model consists of governing variables (achievable values), action strategy (strategies used to meet governing variables) and consequences for themselves and others (Anderson, 1994). When an individual's intentions do not meet their intended outcome, an individual's natural response is to look for another strategy, this is referred to as single-loop learning (Greenwood, 1998). An individual can go a step further and encounter double-loop learning, where an individual questions their governing values instead of searching for a new strategy (Anderson, 1994).

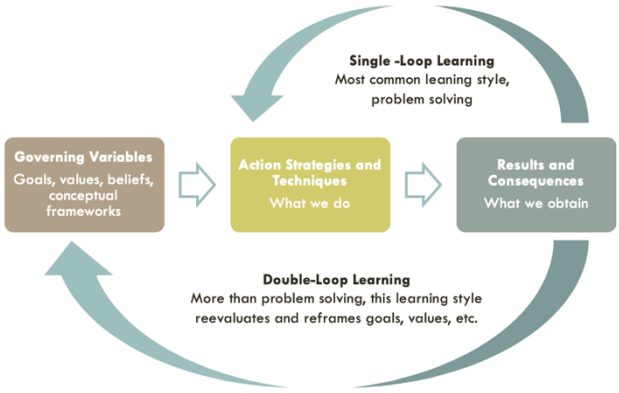

Figure 2. *Argyris and Schon's Model*

While the theory of action has not been frequently applied to technology adoption, it was utilized in one study focused on technology adoption in the workplace (Murdock & Fichter, 2017). The theory was applied to understand why individuals are unwilling to go digital and concluded five recommendations to successful technology adoption: adopt a holistic view of technology change, embed a culture of continuous learning, promote digital literacy, establish a clear link as to why the technology is important, and establish a technology mentor program (Murdock & Fichter,

2017). Argyris (1997) describes learning and action through the lens of the theory in action. Argyris found that what individuals learn early in life can later shape how they cope with the threat of embarrassment or change, and these feelings can be unconscious but yet lead to counterproductive actions (Argyris, 1997). This could be a factor as to why individuals working in extension may be reluctant to adopting technology practices, because of feelings of embarrassment for not understanding the technology or fear of not being able to correctly implement it.

Pietersen's Model of Strategic Learning

The third and last model that will be applied to this study is Willie Pietersen's model of strategic learning. Unlike Rogers' linear model, Pietersen developed a continuous learning approach that allows for persistent success from an organization (Pietersen, 2004). Pietersen (2004) defines strategic learning as "a practical leadership process for creating an adaptive enterprise by mobilizing a dynamic cycle of four steps: learn, focus, align, and execute" (p.2).

- Step 1: make a plan to form strategic choices for the operation
- Step 2: use the strategic choices and create a strategy of how the organization will grow and improve
- Step 3: strategize the implementation and determine how to make it successful
- Step 4: execute the plan

This is a cyclical process that keeps an organization up-to-date and continuously learning and implementing. While this theory has not been directly applied to integrating technology into an organization, the steps and concepts of the cyclical cycle keep an organization accountable for being able to stay up to date with the latest trends and allow for proper planning of implementing and executing the use of new technology into practice.

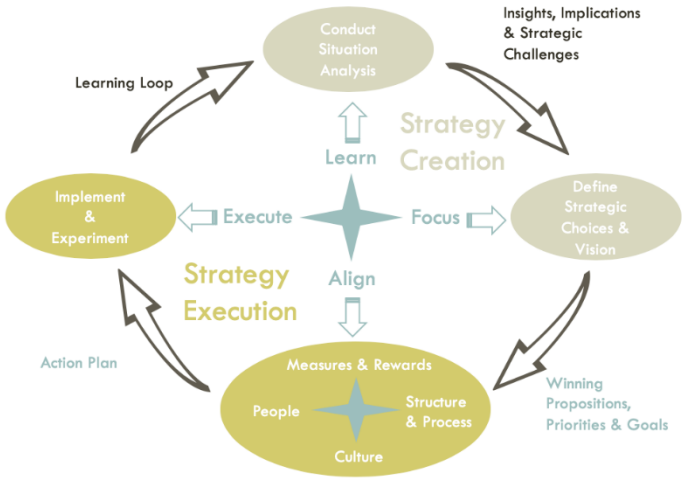

Figure 3. *Pietersen's model of strategic learning*

Theories at Work

In isolation, each individual theory has limitations. However, when all three theories are combined into a conceptual framework, a holistic model is created, allowing for a cyclical approach to adoption, decision-making, and implementation of new technologies (see Figure 4). Rogers' diffusion of innovations theory that deals with the adoption and rejection of innovations is the base for the conceptual framework but lacks the cyclical approach to adoption that is necessary for implementation of new technologies (Murdoch & Fichter, 2017). This limitation leads to the incorporation of Argyris and Schon's (1974) and Pietersen's (2010) models. Pietersen's model fits within Rogers' five phases of adoption model at the compatibility, trialability, and observability steps. By incorporating Pietersen's model, this changes Rogers' linear approach into a cyclical model that incorporates checks and balances to ensure individuals

are incorporating useful innovations into their operations or programs. Argyris and Schon (1974) created models to further explain their theory; the model of theory-in-use and single-and double-loop learning. The theory-in-use model consists of governing variables (achievable values), action strategy (strategies used to meet governing variables) and consequences for themselves and others (Anderson, 1994). When an individual's intentions do not meet their intended outcome, an individual's natural response is to look for another strategy, and this is referred to as single-loop learning (Greenwood, 1998). An individual can go a step further and encounter double-loop learning, where an individual questions their governing values instead of searching for a new strategy (Anderson, 1994). Argyris and Schon's (1974) single-and double-loop learning model acts as the checks and balances system needed for the evaluation of adopted innovations and can easily be incorporated into the learning loop portion of Pietersen's model. If an individual does not like the outcomes of the adopted innovation, they can either go back and choose a new innovation, i.e. single-loop learning, or they can go back to the start and reevaluate the entire situation, i.e. double-loop learning. The combination of the three separate theories allows for a cyclical process to integrating technologies with systems set in place for constant evaluation and reevaluation of the implemented technologies, allowing for Extension to stay up-to-date with technologies for information dissemination and educational programming.

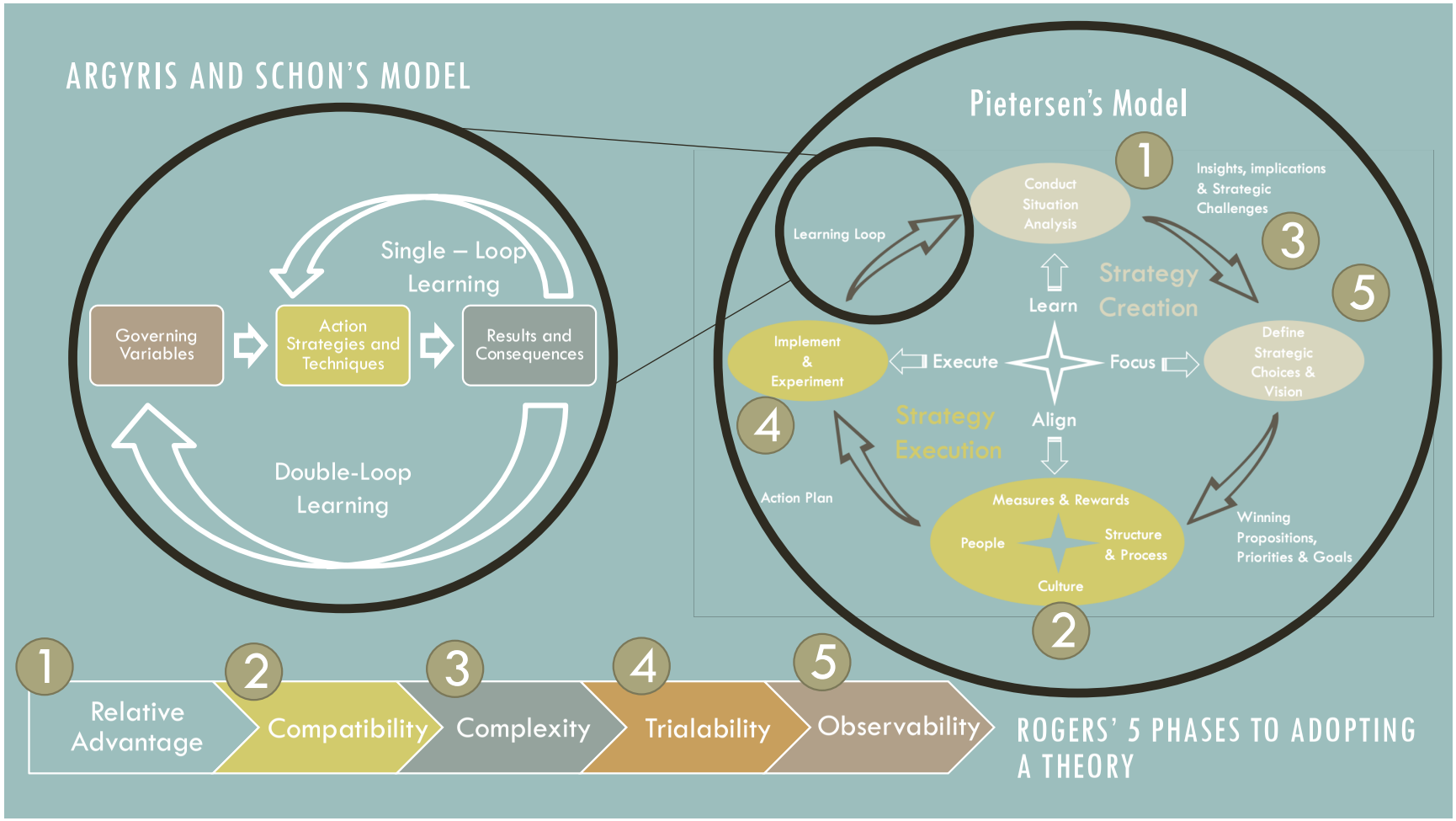

Figure 4. *Holistic Model of Technology Adoption*

Chapter 3 - Methods

Introduction

This chapter describes the research approach for this qualitative research study. A qualitative research design was chosen to identify and examine, more in depth, the key factors in a Kansas agricultural extension agent's decision-making process in the implementation of new media technologies. The intent of this study was to identify what key components incentivize agents to adopt new media technologies, while also identifying major roadblocks to implementation and possible solutions.

Qualitative Vs. Quantitative

Quantitative research uses numerical values or values that are able to be transformed into usable statistics (Yilmaz, 2013). Quantitative data is used in large sample populations that can be generalizable, and gives a numerical component to quantify attitudes, opinions, behaviors, and other variables (Yilmaz, 2013). To gather quantitative data there are multiple techniques to utilize: experiments, surveys, content analyses, and using existing data (Neuman & Robson, 2007). This study utilized quantitative methods to specifically identify subjects for the population for the study.

Qualitative research is more exploratory research and used to gather more information about underlying reasons, opinions, and motivations (Yilmaz, 2013). Qualitative data is used to help build and develop hypotheses and theories (Yilmaz, 2013). Qualitative research is more in-depth with small sample sizes and information that cannot be generalizable to all (Yilmaz, 2013). Quantitative data collection consists of focus groups, in-depth interviews, observations, and case studies (Neuman & Robson, 2007).

This study utilized qualitative research to gain more perspective on extension agent's new media technology use. The main focus of research collection consisted of a qualitative piece, as the sample size is rather small, and the researcher is looking to find in depth information specifically about Kansas extension agents and their use of new media technologies. The information found by the study is not generalizable to all extension agents.

Inductive vs. Deductive

There are numerous ways to analyze qualitative data. Two broad categories are inductive and deductive approaches. The inductive reasoning process is referred to as the "bottom up" approach (Neuman & Robson, 2007). This approach begins with an observation of a phenomenon and progresses into finding patterns, which leads to formulating a hypothesis and ultimately, a general conclusion or theory is created (Neuman & Robson, 2007). Deductive reasoning is generally referred to as a "top down" approach to research (Neuman & Robson, 2007). The deductive approach begins with a theory, and based upon the theory, researchers propose a specific hypothesis that tests the theory (Neuman & Robson, 2007). The end result is confirmation or rejection of the hypothesis. This form of research is highly structured and guided by theory (Neuman & Robson, 2007). For this study, the researcher used the deductive process as three theories, the diffusion of innovations theory, theory-in-use model, and model of strategic learning, guided the research.

Directed Content Analysis

Content analysis allows researchers an adaptable way to analyze text data (Cavanah, 1997). There are multiple types of content analysis that can be chosen based on the researchers' theoretical and fundamental aspects at hand (Weber, 1990). For this particular study, the researcher chose directed content analysis. Directed content analysis is used in cases where

previous research on a theory already exists but further research may be beneficial (Hsieh & Shannon, 2005). Beginning with the prior theories established, the researcher began to identify themes for initial coding categories, and then operational definitions were determined using the stated theories (Potter & Levine-Donnerstein, 1999).

> If the goal of the research is to identify and categorize all instances of a particular phenomenon, such as emotional reactions, then it might be helpful to read the transcript and highlight all text that on first impression appears to represent an emotional reaction. The next step in analysis would be to code all highlighted passages using the predetermined codes. Any text that could not be categorized with the initial coding scheme would be given a new code (Hsieh & Shannon, 2005, pp. 1281).

Based on the three theories being utilized to examine Kansas agriculture extension agents' adoption of new media technology, the researcher used each aspect of the three theories to examine the transcribed interviews. The researcher than analyzed the separate entities and found common quotes and themes throughout the transcribed interviews. The researcher than grouped the commonalities for the analysis and discussion.

Approval

Approval from a formal application to the Institutional Review Board at Kansas State University occurred on August 2, 2018 (Appendix A). The quantitative survey to identify the groups of new media technology users who would be participating in the study began shortly after approval was granted.

Methodological Approach

Research Participants

The targeted population for this study was agricultural extension agents in Kansas. This study used a quantitative process for sample identification prior to the qualitative portion of the study. For the quantitative sample identification process, the researcher attempted to use a census

of Kansas agricultural extension agents to gain in sight of agricultural extension agents. Names and email addresses of all Kansas agricultural extension agents was obtained from Kansas State University. Participants on the list were emailed the survey. A purposive sample was then chosen based on the results of the survey for the qualitative, semi-structured interviews.

Data Collection

This study encompassed a quantitative process for sample identification prior to the qualitative portion. The sample identification process of the study consisted of a short survey that asked agents questions pertaining to their frequency of new media technology usage and demographics. The survey was generated on Qualtrics and distributed via email, as online surveys are best suited for non-probability samples (Van Selm, & Jankowski, 2006). To increase response rate and turnaround time, the questions were created with simplicity, cultural independence, completeness, relevance and neutrality in mind (Swoboda, Muhlberger, Weikunat & schneeweiss, 1997). Due to the busy nature of the extension agents, the size of the survey was kept to a minimum length to encourage participants to engage and complete the survey in its entirety (Sheehan & McMillan, 1999). Dillman, Smith, and Christian (2014), suggest that when contacting survey participants, first send a survey invitation followed by two follow-up emails and potentially a third if the first and second emails result in a significant response increase. The first email should introduce the survey and include the importance of their response, the second and third emails are reminders to participants to complete the survey, and the fourth email, if needed, is a final reminder that the survey is coming to a close (Dillman, Smith & Christian, 2014).

The qualitative portion of the study consisted of semi structured interviews via Zoom, with both audio and video options in use. Zoom was selected as the interview software, as every

employee and student attending Kansas State University has free access. Using this platform also kept the data collection environment and method the same throughout all interviews. Through Zoom, the audio was recorded to refer back to later. The video was also recorded to capture participants' body language and how they not only responded verbally but also physically to the questions. Semi-structured interviews were used to allow for prompting, guidance of the questions, and exploration of attitudes (Richardson, Dohrenwend, & Klein, 1965, Smith 1975) to ensure key concepts of the study were discussed. Semi-structured interviews also allow for probing, which permits the interviewer to explore the participants' answers further, as well as obtain complete information (Louise Barriball, & While,1994). Wolcott (1995) suggests stopping the interviews when the data desired is reached and the researcher feels the data collection is saturated.

Analytical Procedures

The short survey provided to the 98 Kansas agricultural extension agents had a response rate of 57 percent with a total of 56 respondents. The survey collected demographic data about the agents, such as how long the individual has been an agent, what their educational background is, and their thoughts on new media technology in extension (positive, neutral, or negative). The portion of the survey that asked questions about individuals' new media technology use was derived from an instrument used in a study of trends in the use of new-media marketing in U.S. ornamental horticulture industries. The survey questions were designed to measure three types of individuals: 1) non-users; 2) those using some new-media; and 3) those using new media marketing (Peterson, Boyer, Baker & Yao, 2018). After being asked questions about their demographics, individuals were asked if they used new media technology for work-related purposes. If the individuals answered no, they were routed to the end of the survey and

automatically placed in the non-user category. If the individuals answered yes, they were asked a series of questions relating to their frequency of use of new media technologies. This frequency scale was between 1 (never) and 8 (daily). Correa, Hinsley, & De Zuniga (2010) used an additive scale to calculate how often individuals accessed certain forms of new media technology. Individuals' replies were measured on a 10-point response scale, where 1 was very rarely/ never use new media technology, and 10 was very often (Correa, Hinsley, & De Zuniga, 2010). The individuals were then placed into four groups.

The researcher combined the two methodologies, using the 8-point scale of the first study and the four separate categories from the second study, in order to find the four categories of new media technology users. The researcher used SPSS to run the statistics. The answers for the new media technology use survey questions were added, and the means were used to indicate which group the participant belonged to. Based on the survey results, extension agents were sorted into one of four groups.

1. Heavy Users: average scores fell between 5.50 → 8.0
2. Medium Users: average scores fell between 3.50 → < 5.5
3. Light Users: average scores fell between 1.5 → < 3.5
4. Non-Users: average scores fell between 1.0 → < 1.5

Initially, three extension agents from each of the four user groups (heavy users, medium users, light users and non-users) were to be selected at random for the semi-structured interviews. However, after the groups were established, only one individual from the list of respondents fell into the category of high user, and only two individuals were categorized as non-users. The low and medium user groups were fulfilled with three participants in each of the groups.

After individuals were randomly selected for the low and medium user groups (the non-users and high user groups did not have enough participants for random selection), semi-structured interviews were conducted. The semi-structured interviews followed a standardized open-ended style. The participants were asked identical open-ended questions (Gall, Gall, & Borg, 2003). This structure of interview allows participants to thoroughly answer the question and gives the researcher the opportunity to ask probing questions (Turner, 2010). This method was chosen as it provides rich in-depth data while reducing researcher biases within the study (Gall, Gall, & Borg, 2003).

The interview questions were created using the guidelines given by McNamara (2009), who suggests five elements to consider when creating interview questions:

1. Questions should be open ended
2. Questions should be neutral and not leading
3. Questions should be asked one at a time
4. Questions worded clearly and avoid confusion
5. Try to avoid why questions

When starting the interview, DiCicco-Bloom & Crabtree (2006) suggest making the first question broad and a reflection of the research in a non-threatening manner. This creates a comfortable setting for the interview. The researcher followed this approach when conducting the interviews.

Data collected from the semi-structured interviews was transcribed into text by the researcher. The identities of the agents were replaced by pseudonyms to ensure confidentiality throughout the entire study. The researcher analyzed the transcripts by new media technology user groups and individually. This allowed the researcher to see overall themes emerge as well as

emergent themes in the different user groups. The transcribed interviews were analyzed and compared against each of the four groups (heavy users, medium users, light users and non-users) and also as individual agents. Themes and categories were established using a directed content analysis, where the researcher previously identified portions of three separate theories to code the transcripts.

To keep the research reliable and valid, the researcher followed the guidelines set out by Morse, Barrett, Mayan, Olson, & Spiers (2002) that included verification strategies that established reliability and validity in qualitative research. These strategies included methodological coherence, sampling sufficiency, developing a dynamic relationship between sampling, data collection and analysis, thinking theoretically, and theory development (Morse, Barrett, Mayan, Olson, & Spiers, 2002). Methodological coherence ensures that the research questions align with the methods. As the research study progressed, the researcher made sure to modify the questions based on the demand of the data. A correct fit between the data and methodology components is vital for the reliability and validity of the study, as it is imperative in qualitative research to ensure what is intended to measure is actually being measured. Next, the researcher made sure the study included sampling sufficiency. The study's participants were most appropriate for the study. The researcher determined that Kansas agricultural extension agents were the best group to interview, as they were the subjects under examination. Morse (1991) discusses the importance of sampling adequacy, which must be gained through saturation and replication. The researcher found that after interviewing the nine participants, the information provided became repetitive and saturated, making the sample size adequate. The next step in creating reliability and validity in the study was the collection and analysis of the data. The researcher used semi-structured interviews following a standardized open-ended style,

as this method reduced researcher biases within the study (Gall, Gall, & Borg, 2003). The researcher then analyzed the data multiple times to ensure the transcripts were coded the same way each time establishing replication and saturation of the data. The last two steps mentioned by Morse, Barrett, Mayan, Olson, & Spiers (2002) included thinking theoretically and theory development. The researcher utilized three theories to guide the research, and ideas that emerged from the data aligned with the previous theories but also brought about new information to move the research forward. The final component, theory development, was realized through the proposed new holistic model for technology adoption.

Chapter 4 - Results and Discussion

Introduction

The purpose of this qualitative study was to look at Kansas extension agents' use of new media technology and their decision process behind adopting or rejecting the use of new media technology, while also identifying potential roadblocks preventing adoption. The researcher looked at Kansas extension agents' use of new media technology and their decision-making process through three separate theories: Rogers's Diffusion of Innovations, Argyris and Schon's Model and Pietersen's Model of Strategic Learning. Through this study, the researcher gained knowledge and perspective on what drives Kansas extension agents to be more apt to adopt new media technologies and what roadblocks could be preventing the adoption of new media technology. This study sought to provide an increased understanding of how Kansas extension agents can realistically and effectively implement new media technology in their roles, and looked to answer the following research questions:

- RQ 1: What elements foster adoption of new media technology in agricultural extension by Kansas agents?
- RQ 2: What roadblocks prevent the implementation of new media technology use in agricultural extension?
- RQ 3: Why do Kansas agricultural extension agents continue to use new media in agricultural extension?

Overview of Participants

Nine Kansas extension agents, who held a position in agricultural extension, participated in the study. A list of the participants in the study can be seen in Table 1. Of the nine participants, four were female and five were male. As outlined in Table 1, the participants

represented a range of fields and roles within extension. Of the nine participants, one had worked in agriculture extension less than a year, four agents had worked in Agriculture extension for one year, one had worked for five years, one had worked for 17 years, and two agents had worked in agricultural extension for 30 plus years. In an initial process to identify participants for this study, all Kansas agricultural extension agents were asked to complete a survey. In the survey individuals were asked various questions about their use of new media technology. After evaluating the participants answers the individuals were placed into four groups: non-users, light users, medium users, and heavy users.

Wayne and Gerald, who both have worked in extension for 30-plus years, were placed in the non-user group. Tom, Scarlett and Dean, have respectively worked in agricultural extension for 17 years, 5 years and less than a year. They were placed in the low user group. Abby, Kale and Jessie, have all worked in agricultural extension for a year and were placed in the medium user group. Kara was the only agent to be placed as a high user of new media technology and has been working for agricultural extension for a year.

To begin every semi-structured interview, all agents were read the following definition of what new media technology consisted of: For the purpose of this study, new media technology is defined as an all-inclusive communication technology; new media technology encompasses a wide variety of web-related communication technologies, such as blogs, wikis, online social networking, virtual worlds and other social media forms (Friedman & Friedman, 2008).

Table 1. *Demographics of the Nine Interview Participants for the Study*

Pseudonym	Gender	Level of Education	Education Background	Position	User Level
Abby	F	Bachelor's	Horticulture	Horticulture Agent	Medium
Wayne	M	Bachelor's	Animal Science and Industry	County Coordinator Agriculture Agent, Horticulture Agent, 4-H Agent	Non
Kara	F	Bachelor's	Horticulture	Horticulture Agent	High
Kale	M	Master's	Biology, Education	District Director, Crop Production Agent	Medium
Dean	M	Bachelor's	Animal Science and Industry	District Director, Agriculture and Natural Resource Agent	Low
Gerald	M	Bachelor's	Animal Science and Industry	Agriculture and Natural Resources, 4-H Agent	Non
Jessie	F	Bachelor's	Agronomy	Agriculture and Natural Resources Agent	Medium
Tom	M	Master's	Agricultural Education	Agriculture and Natural Resources, 4-H Youth Development Agent	Low
Scarlett	F	Bachelor's	Animal Science and Industry	Livestock Production Agent	Low

Analysis

The interviews were recorded via zoom and transcribed by the researcher. All nine transcripts were included in the data analysis process. The researcher read through each of the nine transcripts multiple times to obtain a good understanding of the data, and she used elements from each of the three theories utilized to perform a deductive analysis and identify prevailing themes. The researcher used the software Nvivo to code the data and identify established and unexpected themes.

Three major themes and one minor theme were identified from the analysis conducted by the researcher. The participants from the study mentioned all aspects of the three models, Rogers's Diffusion of Innovations, Argyris and Schon's Model and Pietersen's Model of

Strategic Learning, when it came to the discussion of extension agent's decision on adopting or rejecting new technologies.

Analysis of the data resulted in three major points of interest: 1) The relationship between relative advantage, compatibility, focusing and aligning; 2) The relationship between complexity, trialability, observability and learning; and 3) The relationship between executing and Argyris and Schon's model.

The relationship between relative advantage, compatibility, focusing and aligning

The relationship between relative advantage, compatibility, focusing and aligning, most readily aligned with one another and were collectively the most abundant theme throughout the semi-structured interviews. These four components essentially describe the "fit" of a technology in relation to what the agents are looking for when adopting a technology. These elements were the biggest driving force behind agents' desire and willingness to adopt new technologies. When looking at the four elements composed from the three guiding theories with regard to research objective one, what elements foster adoption of new media technology in agricultural extension by Kansas agents; client demand, client use, and adaptability of the technologies were mentioned the most throughout the interviews. Agents only wanted to utilize technologies if there was a direct benefit to their clients. Jessie mentioned that the area she serves is more suburban than some of the other counties and districts in Kansas. With a higher population of individuals in her county, she recognized the importance of utilizing new media technology to engage her clientele. Jessie stated,

> So part of it is just us recognizing that a lot of our community and the folks that we're trying to reach are on these platforms, they are entirely dependent upon technology to get their updates to get their news. When we asked folks like 'how did you hear about this' or 'where did you see it,' 'oh I saw it pop up on Facebook' or 'I saw like there was an event for it' and it brings in a lot of draw. I know I think we're close to 2,600 followers on

> Facebook which is a large number in comparison to a lot of [counties]…it's a small percentage of folks that we could be hitting but it's growing as we continue on.

In an occupation so heavily driven by client demand, it is imperative that the way individuals receive their information is in a manner that is practical and functional to their clientele demographics. Client demand drives extension's existence. How clients want to receive their information essentially dictates how agents push information out to the masses. Jessie speaks strongly on the subject of being aware of the client demographic you are trying to reach. As a high new media technology user, she understands new media technology well, but also sees the importance of correctly aligning the client with how they receive their information. She states,

> A large portion of what drives me towards pursuing a social media platform or some other format other than the traditional [platform], is the folks we're trying to reach are on those platforms. We have direct emails for folks that I'm trying to target for a fencing and lease laws workshop so I know I can get in direct contact with them, however those folks will probably have a different approach to social media than folks we're trying to target on pond management, because we have a lot of urban folks that have ponds that aren't just your agricultural producers. We can probably target them a little bit more with a social media campaign than we might those traditional farming and ranching folks that need a little law information on leasing and fence laws.

Kale, a medium user, who works in a more rural area with an older demographic, energetically speaks of his willingness to adopt new media technology if the demand was there. However, he also states that until his demographic of clientele physically asks to receive their information via technology, he would be less likely to focus his attention on adopting new technology and would not make it a priority. Kale states,

> I think honestly if there is an organic…request from the public or like we're hearing 'hey are you guys on Twitter?' 'Are you guys on Instagram?' If that was an actual legitimate, like you know question, and I think that would be almost reason enough if it was like this one person because if that, if one person is asking, inquiring for that, there's a possibility that others are too. So honestly, I haven't become aware of anyone reaching out in that direction, but I think, I think just as in Facebook, if that's where people are and if that's where people want to, to receive their information by all means let's set up an account and let's just roll with it. But I think until that time, that legitimate request comes in you know it's just not a priority.

Agents who worked in highly populated and more suburban areas saw a greater need and demand for information dissemination via new media technology and were more driven to learn and adopt new media technologies. Other agents working in less populated and more rural areas, said while they could see the benefit of new media technology, without the demand from their clientele, it did not foster the need nor desire for them to learn a new technology. Agents also noted when working with an older generation of farmers and ranchers, for example, the clients did not allow for easy integration of new media technology. Some even stated there was a backlash or demand for such things as hard copies or physical flyers of events. Kale and Kara both spoke on this subject matter. Kale, working in a more rural area, has a difficult time getting individuals to interact with his material posted via new media technology. Because of the lack of interaction on media sites and technologies and his clients' draw towards a more "old fashioned" way of receiving information, Kale puts more of his time and effort toward creating hard copies of information. Kale states,

> I very rarely hear anyone say, 'oh I saw that on Facebook thanks for letting us know about that.' I, I have had a lot of people say 'You know we saw that on the newsletter' or honestly, you know for my demographics, that says 'oh I, I did see that flyer at the co-op.' So that's kind of, I still think I'm reaching more of my clientele you know either in person, face-to-face, or with physical fliers and stuff hanging around, hung up around the community where they come across them.

While Kara works in a more urban area and sees a much higher demand for the use of information dissemination via new media technology, generational roadblocks still play a factor in her decision making to adopt and utilize new media technology. She states,

> It's kind of hard because in extension we work with a lot of older clients that sometimes have almost a negative attitude towards it or just an unwillingness to be you know, subscribe to a newsletter or to follow us on Facebook. They'd rather just get something in the mail or [pause] so there's kind of a, they don't want to change. They don't want things like that. So sometimes it's hard, but we're trying to bring in new audiences and things like that.

While all four groups mentioned the need and place for new media technology in extension, not all user groups were as excited and eager about adopting new technologies. Gerald talks about the correlation between demand and his willingness to adopt a technology. Gerald, a member of the non-user group, was more reluctant when it came to the thought of adopting new media technology, and he needed to see a demand for it prior to adopting the technology. He states,

> A lot of that, the way the programming comes about, is if we hear from our clients more so than from you know from a bottom up or top down kind of a thing yeah, if I, if I knew it was going to be used and it was worth my time and effort to do it, I would be more likely to look into doing it, learning it and utilizing [it].

All four groups of non-users and users viewed new media technology as an additional tool to better connect with younger generations getting involved in agriculture. The majority of the agents attributed their willingness to adopt new media technologies with the ability to engage a younger audience. This desire to align the way a new generation was wanting to receive their information meant extension would be able to reach a whole new audience they previously had not been able to reach. Wayne stated that he knew he was missing out on reaching the younger generation by not utilizing new media technology. He states,

> the benefit [of new media technology] would be to reach the younger audience that has those and that is what they look to receive information that would be a benefit to reach an expanded audience and in my old mind it's going to be a younger audience that I am not reaching in public meetings and tours probably even in email and websites.

Abby also commented on the lack of outreach for the younger generation and spoke strongly about identifying how they want their information, recognizing that the connection is key to the survival of extension. Abby says,

> I don't think we have a lot of millennial clients and I don't think we're ever going to get them unless we're reaching them in the ways that they're comfortable, which is a lot of times Facebook or other social media sites. So, for me, it's, it's that I again, I worry that we're going to become obsolete if we don't start to work at it and it is a lot of work. You know, we put up Facebook post that we think are great and they're completely

> unsuccessful. So, I just feel like we need to really push at it hard now so we can get really good before we have to be really good.

The medium and high user groups however, saw new media technology not only as a communication tool but also as the future of extension. The medium and high users discussed growing up in a technology ambitious world, where learning a new technology came second nature to them. They did not see learning a new technology as a roadblock necessarily, but more of an opportunity to reach more individuals or to be a better agent. Abby, a medium user, states,

> You know people come into our office, we answer a question, we do a program and people kind of interact with us like that and that's fine. But if we just keep doing that, I think that the future of extension is not going to be great. I think, I think that we will not have a place in society, so I really look at social media and new media as a necessary part of my job and that if I'm not really pushing to be finding people in a different way and reaching them in a different way than me or my position will become obsolete and people won't really turn to extension like they have for, you know, over a hundred years.

When looking at the relationship between these four model elements in regard to research objective two, what roadblocks prevent the implementation of new media technology use in agricultural extension, the majority of the issues discussed related to generational differences. These generational differences came from both sides of the spectrum, the agents and the clients. When discussing older generations of clients and their unwillingness or inability to access information via new media technology, agents were less willing to adopt technologies that their clients could not or would not access because they feared it might create an unnecessary increase in workload. This unnecessary workload refers to creating material via new media technology, as well as material for the older generations, who are unable to easily access new media technology. Kara talks about the difficulty of balancing two generations, and their desire to receive information in different manners. She states,

> It's kind of hard because in extension we work with a lot of older clients that sometimes have almost a negative attitude towards it [new media technology] or just an

> unwillingness to be you know, subscribe to a newsletter or to follow us on Facebook. They'd rather just get something in the mail [pause] or so there's kind of a, they don't want to change. They don't want things like that. So sometimes it's hard, but we're trying to bring in new audiences and things like that…I just try to cater to everyone. If I have an older client, you know that doesn't have an email. I'm still going to mail them the information. I'm not going to be mad at them for having to go put a stamp on the mail send it to them.

Another generational roadblock mentioned by the agents was the generational gap amongst themselves involved in extension. The medium and high users, the majority of which claimed to be millennials themselves, mentioned the differing levels at which Kansas agricultural extension agents utilized new media technology in the offices. The agents stated the lack of uniformity in usage of new media technology made it difficult to utilize different platforms regularly, and also noted utilizing more than one platform became difficult. The agents stated if they were going to utilize new media technology, they wanted to employ it correctly and get the most use out of it. All nine agents reported using Facebook in some capacity, but that was the only new media technology they all had in common. One agent had just created a Facebook account for the first time the week prior, while another district was commonly accolated throughout the interviews by other agents for their social media presence. There was no baseline or uniformity when it came to the use of new media technology. This lack of uniformity made it difficult to set a precedent of what was expected from the agents and how they were supposed to interact with new media technology. Abby talks about the difficulty of moving forward when using new media technology; while one agent may be very experienced in new media technology, if another agent was not, it would create a level of imbalance in the office. She states,

> I would want to make sure that we kind of could all get on board with one [new media technology] before we went to another one. I think [pause] still the inconsistency, I would like you know everybody to contribute the same amount. We're still working on it, but I feel like it kind of ebbs and flows. Like maybe we'll have a month where everybody contributes and then for three months it just kind of goes back to the one or two or three

> of us that are more comfortable with it. So still the consistency and then the follow through.

Wayne, a non-user who had worked in extension for over 30 years, eluded to his own personal desire to learn a new technology as a roadblock. Wayne did not grow up in an era where digital technology was abundant and was not as intrigued or enthused about the idea of changing the way he did his job. Wayne's lack of relative advantage, compatibility, focus and alignment for the use of new media technology, created a barrier that led to the individual's lack of desire to utilize or adopt new media technology. When asked why he had not implemented or adopted new media technologies he stated,

> Personal attitude is the slow down, so to speak. I've been here 40 years, and not to say I'm not going to be here five, ten years, and not to say you still shouldn't embrace it but it's probably prioritizing what do I think I want to do next month, two months, two years.

Less common roadblocks mentioned by the agents, the fit of the technology and their willingness or desire to adopt new media technology, were the agents' ability to target the right audience through new media technology, the loss of face-to-face connection and overcoming the negative connotation associated with new media technologies. Kara, a high user of new media technology, talks about her struggle of reaching the right audience. New media technology is not a controlled environment, such as email or sending mail, where the recipients of the information are known up front. Kara talks a lot about working with the algorithms Facebook uses and how they are always changing, so knowing who is seeing the information can be a challenge. She states,

> Sometimes I wonder if we're reaching the people we really want to reach. I feel like the people that interact on those pages are sometimes, you know people in Manhattan or Kansas Forest Service or people that aren't like in our district maybe? So sometimes I do feel like we don't have as much of a local reach in those areas.

While Kara was worried about aligning with the correct audience to disseminate information, Dean was worried about the compatibility of new media technology. While he mentions he sees

a direct benefit of using new media technology, such as Zoom, to engage individuals who might not be able to attend meetings in person, he fears the lack of in-person communication could be detrimental to Kansas extension. Dean states,

> Zoom meetings, we considered doing for like programs for people that maybe can't travel that far. I don't know how to feel about that, we haven't tried it yet so I guess the pro would be you could reach more people if they would join in. The downside is you don't have people there in the room because sometimes they develop that continuity with other people in the community for a buy-in you know, whether I'm doing an Ag program where I also work with economic development, so we have stakeholders in different communities or in different projects you really want them in the same room face-to-face you can see their facial expressions and be able to develop that personal relationship to move the project forward.

Scarlett was the only agent to bring up an issue of the board members not being on board with the use of new media technology. Extension is a very time-oriented profession. A lot of the previous research found time to be the biggest roadblock to implementing social media in extension. However, Scarlett did not mention her own personal time as being a roadblock but rather brought up the fact that the board members were not sold on the idea of the agents using their time to implement new technologies that would include social media. Scarlett states,

> I've only been here a year, so it's kind of slowly acclimating everybody to the idea of these things and also getting the time to utilize them because some of the board doesn't necessarily think that that's the best use of time.

When looking at the relationship between relative advantage, compatibility, focusing and aligning in regard to research objective three, why do Kansas agricultural extension agents continue to use new media technology in agricultural extension, a couple themes emerged. The most prevalent response was new media technology's ability to disseminate data easily and in a timely manner. All four groups of agents expounded on their appreciation of new media technologies' ability to get information out to the public in a timely manner. Today's society

wants immediate results and information at the touch of a button. Tom commented on this immediacy and states,

> What I like about it [new media technology] is that it's a way of reaching people instantly if we think of a "microwave society," well it's a way of reaching people instantly and it's a way of reaching a very large number of people okay, so you know that's, that's the part that I like about it.

Agents want a tool that will allow for prompt delivery of information while also bridging the gap and delivering extension to more people. New media technology allows for the information to get to their clients in a timely manner and allows for relevancy by the time the information is received. Agents stated things like "it makes it easier to give out information to the public really quick" and "I think it's really useful in, in its immediacy to be able to communicate." Scarlett talks about the speed at which information is obtained by clients, but also conveys the ability to communicate in real-time with clients without being face-to-face and also having the ability to spark interests that they may have not known they had. She states,

> The speed and how information gets out to people…you can push out an article or a meeting and [have] it come out that very day, you know, very minute to people. Yeah the speed, I think, and also the response you can see the immediate feedback at how many people have… responded to and how many people have liked the page or shared the page. I think it's interesting to see how many more people, once I start sharing it, it starts going out to people and being viewed. I think that the response time, if they do message you or call you, you, you know it tweaks it, they may just be skating through their Facebook page but something you put on there just tweaks an interest in them 'oh yeah I need to ask about that.' So definitely the speed is I think is the biggest advantage.

Another advantage that the agents brought up was the vast outreach that new media technology permits. Individuals live busy lives and in many circumstances, extension clients are busier during certain times of the year, have prior commitments or live long distances away from meeting sites. The everyday hustle and bustle of life makes it difficult to get individuals to attend meetings and programs. However, through the use of new media technology, agents are able to navigate these roadblocks and provide information in various other avenues. Kara discusses her

success with Facebook live and other new media technology platforms to get her program information out to clients, even if they were not able to attend. She states,

> If I do a big program, I know I'm not going to be able to get everyone there like if it's a [pause] I do a program on a Thursday night there's going to be baseball or something and some people aren't going to be there. But if I do a live video on Facebook they can lay in bed and watch it when their kids are asleep and they can watch it later, you know after it's been recorded. So I think it's, it's awesome that you can just reach everyone and maybe they don't want to get out and come to a program for whatever reason they you know they don't want to be in a group or something so they can just get that education at home or wherever they may be through Facebook or Instagram or whatever it is.

Another agent reinforces the benefit of new media technology and its ability to reach more individuals and a younger generation, but also mentions the older generations are still looking towards older forms of communications to receive their information. Scarlett eludes to the importance of knowing your audience and being able to get them information in a way that is easily digestible and matches their preference. She states,

> I think we can reach more people as far as meeting, planning and getting our articles out there. I think the older, older generation is missing out they're still looking at the newspaper but [pause] and that we still put articles in newspaper and that sort of thing but it's not the younger generation under probably 50…not looking at the paper like that and they're mostly on Facebook Instagram or Twitter.

Analytics was another reason some of the agents continue to use social media. Many social media and new media technology platforms have the ability to collect data on individual interactions with the different medias. Agents with a greater social media following appreciated this function and felt it helped them to increase their new media technology engagement. By being able to see how their clients interacted with various communications pieces, agents were able to get a better idea of what types of posts or content were getting the most engagement. Agents also noted that they liked the fact that they could physically see the results of their efforts by the number of individuals who attended meetings or interacted with the content on the new media technology platforms. Jessie states,

> The number of people who say like ‘I've come to this workshop’ or like ‘I found out about this with some social media’ and so that's where it's a little bit easier to track in that regard to because you're able to see the numbers on how many interactions, how many people have viewed this, like it's easier to track those statistics. I think, I think the social, the new media technology is useful and will continue to grow.

The relationship between complexity, trialability, observability and learning

The relationship between complexity, trialability, observability and learning in correlation with Kansas extension agents’ willingness to adopt new media technology emerged as the second-most mentioned theme throughout the semi-structured interviews. These four components all share a commonality of how a technology encompasses functionality and practicality. When looking to adopt new media technology, agents first looked for a technology that would align and be compatible with their clients and their clients’ needs. The next factors they considered when looking to adopt technologies was the level of difficulty the technology possessed and ability for complexity reduction through observing it, trying it, and learning it. When looking at the four elements composed from the three guiding theories with regard to research objective one, what elements foster adoption of new media technology in agricultural extension by Kansas agents; being able to see the technology’s benefits through watching others utilize the technology and education accompanying the technology were the greatest deciding factors in individual’s willingness to adopt new media technology.

The ability to view others using or benefitting from new media technology was mentioned the most with regards to agents’ motivation for adopting new media technology. Agents who could see the benefit of the technology prior to adopting a new technology were more willing to give the technology a chance. Many agents made statements like, “I look to other extension districts and county pages and then I look at like K-State's main page or like Kansas Forest Service or things like that and kind of compare, so I think that kind of helps to drive the

motivation." Kara talks about the older agents' reluctance to adopting these new technologies because of a lack of understanding the purpose or potential the technologies possess. In order to get this demographic of agent more excited about the use of new media technology, they need experience success through the platform itself. Kara states,

> I've seen people, like older ag agents are some people that are just very reluctant to get on Facebook or anything, but then they'll do something and it'll get a big reach and so it just needs to prove to them that it's important and that people care about what they have to say and what they're [pause] you know, what is happening in the fields or in livestock or whatever it may be.

Multiple agents mentioned one district in particular that did an outstanding job utilizing new media technology, specifically social media, and their ability to efficiently and effectively utilize the different platforms. The other agents set this district's social media pages as the precedent to follow and were more likely to adopt different social media platforms based on the success of this district. Agents want to know that if they are taking the time to learn and utilize a new technology that the results will show and be beneficial. Abby discusses her reasoning for following another agriculture extension office and other businesses for parameters on how to better adapt and equip their current technology. Abby states,

> [*District name*] extension district does incredible Facebook posts and I stalk their Facebook page like you would not believe. Every time they post I am right there looking at what it is and how many likes it has and you know, all that kind of stuff. So, if there was and [pause] and other businesses are great, but I feel like extension is kind of a weird business because we're not trying to sell you anything. We're just over here like 'hey, we want to make your life better and we've got all this free stuff come get it' and people are like freaked out by that. They're like, 'I don't trust you like that seems really weird.' So I'm really big on looking at other Extension pages because they're that same kind of weird as we are and just seeing what, what works for them but if any other extension offices or even extension as a whole had you know Twitter pages and Instagram pages and some of them do, I would be all over that just to kind of see what they're doing and see if it's worth it for us to be doing it.

Abby also commented on the success that one extension district in particular has had with their social media pages, but addresses the management aspect of running the new media technology

more so than the actual content that is being posted on the page. She relates the success of the page to not just the content of the page, but also how the page is run, through designated individuals with the help of the agents for content and material. Abby,

> [*District name*] extension district is fantastic they have, I believe, one or two of their office professionals that puts all their social media out, but all the agents contribute. I think that would be really great if we had a person one of our office professionals or whoever that was comfortable with that. I think it's just making sure that, that person is the one that's attending the trainings, knows sort of what it should look like and all those things.

Tom, an agent in the low user group, looked toward agents in his own office who were more fluent in using new media technology for guidance, support and encouragement to gain more confidence in his ability to take on the task of learning and utilizing a new technology. He mentions "I see how my colleagues are using it and I know that they're better than I am, and I need to be better at that." While Tom looked towards his collogues to find a desire to utilize a new technology, Dean, also a low user, took the opposite approach. When it came to learning a new technology, specifically Twitter, he had stated "I've never used Twitter but I've never seen the benefit of using Twitter from other agents that are doing that." The lack of success he had seen from other agents decreased his ability to see the need for the platform, which in turn, decreased his willingness to adopt the technology.

Other agents attributed the willingness to adopt new technologies to just familiarizing themselves with the technology and seeing the platform gain momentum throughout extension as a whole and in their personal use of the platform. Jessie spoke immensely on this topic,

> I mean, I think a lot of the frustration across the state and reluctance to adopt anything new it's just because we are creatures of habit but once a platform has gained some steam and has kind of solidified itself, like Facebook is now pretty solid, yeah going anywhere I think it's definitely gained traction across the state especially once folks start seeing success stories come from it because if they can witness it themselves, and it's not being compared to it, that's when they're more willing to I think adjust to it and take it into their own scope.

Jessie also goes on to talk about her own success utilizing new media technology and how it has increased her willingness to continue adopting new media technology and continue to embrace the ones she currently employs.

> I think some of it is helpful especially when you see certain posts take on, take on almost a viral capacity. One this summer, on how [pause] I think it was when you're supposed to pick tomatoes off of the vine, that ended up getting like several thousand likes. In our office that's a viral capacity…I mean I think it was something that was able to be shared across the state of when you hit that perfect content that's at the perfect time to the perfect viewers it hits and it then gets shared and other folks streams and there are feeds so they're able to connect with research and extension that may not have ever heard of it before.

The second most mentioned theme when it came to agents' willingness to adopt a technology, pertaining to relationship between complexity, trialability, observability and learning, were trainings and education on the technologies being used. All groups of agents mentioned some type of training in some capacity. The majority of the high, medium, and low user groups had attended some type of new media training, while the non-users and a few low users said they would be more than willing to participate in training. Agents spoke very highly of the trainings and were excited to incorporate what they had learned into their positions. Kara, a high user, admitted that while she knows a lot about new media technology, she still gained a lot of knowledge from attending trainings and was better able to navigate social media after receiving training.

> I think I've actually learned a lot through some of these trainings like how many times a day you're supposed to post, and you know [pause] because our page is considered like a business page, so Facebook puts us down at the bottom of a feed and things like that. It's stuff I never knew like yes, I know how to use Facebook but I never knew that, and if you use the word "like this page" in a post, it'll knock that down because they don't want you to tell people. There's a lot of little rules and algorithms and stuff that's really complicated. So, I learned a lot even though I thought I knew everything about Facebook I did not.

Throughout the structured interviews, agents mentioned various trainings offered through various avenues. The university was one of the biggest proponents of training for the agents but was not the only one. Abby and her colleagues were all very interested in what new media technology had to offer and took multiple opportunities to learn how to best manage and implement new media technology into extension. She states,

> We went to the new media market boot camp, a few of us in the office last year, I can't remember the date of that one [put on] by the Center for Rural Enterprise Engagement. Then Facebook actually just held a free class here at the Kansas Expo Center, which our office is very, very close to, and so we all [pause] everybody in the office attended a few different sessions for that as well. But we've done some zoom meetings anything K-State will offer we will attend and anything else as well, we're all kind of keeping our eyes open for that and looking for trainings for that as well.

While none of the agents disagreed that training would benefit and encourage them to be more engaged with new media technology, one agent did voice his concern with the varying levels of users. Gerald, a non-user, when asked about what would encourage him to adopt new media technology, explained that trainings would be beneficial but also voiced his concern that not all agents are on the same level. While Gerald had little to no experience with new media technology, another agent could potentially be very knowledgeable in this area and considered a high user. The differing levels of users make it difficult to train both individuals at the same time without creating frustration or boredom in the agents. Gerald explains,

> I can always say agent trainings and I know that's a challenge because of the differences in skill levels already that are out there, but maybe some instruction for old geezers, I don't know, might help…and probably part of it I just need to make a more concerted effort just to do it myself.

Just like Gerald, many other agents expressed the need to personally find time to just simply play around on the technologies and learn by "just doing it." This theme was consistent across user groups. Abby, a medium user states,

> A big way that I've learned on Facebook is just by spending time on it. What do I like to see in business pages? What do I engage with and so with those other platforms? I'd probably just try to spend some more personal time on it to figure out what's working for other pages and kind of see what we can do to implement that on our own.

Wayne, a non-user, also spoke of taking matters into his own hands and learning himself. Ironically, Wayne mentions using YouTube tutorials, a new media technology, to learn how to engage with and implement new media technology.

> There're tutorials and everything from catching a mouse to, to doing Facebook. I'm sure and so [I] just go find somebody younger than me and we could get started.

When looking at the relationship between these four model elements in regard to research objective two, what roadblocks prevent the implementation of new media technology use in agricultural extension, the majority of the issues discussed again related to generational differences. The majority of the generational roadblocks in this section however, related to the agents' ability to utilize the technologies and had less emphasis on the clients. Agents also brought up the roadblocks of time, which aligns with previous literature, and lastly actual act of utilizing the technologies.

By far the most common roadblock mentioned when it came to agents' willingness to adopt technology when looking at the technology's complexity, trialability, observability and learning, was the generational difference amongst agents. While all agents agreed that learning a technology would increase their willingness to adopt the technology, many mentioned the difficulty in attending a training that would benefit all levels of users. Kara states,

> I think it's, it's hard for some people because some people are so advanced and then some people [pause] like we have a few older agents on our team that aren't as good at it and it's not their fault. They didn't grow up [with it], it's just different because everyone has their own levels of experience and comfortability using it.

Kale also brings up a very valid point between older generations and millennials. He states,

> With my generation this just comes second nature we don't even expect to know necessarily how to do a new thing when it comes out online we expect to learn you know very quickly and then master it and keep moving on and so when something new pops up it doesn't like cause us any anxiety it's like oh yeah something's new we gotta deal with it now and so for the older generation it can be very just destabilizing.

Kale talks more in-depth about the generational divide from the clients' perspective. Just like in the case of the agents, clients also have a huge gap in their knowledge of utilizing new media technology. Some clients are unsure of how to even turn on a computer. The lag in knowledge creates a large deficit on the ability to learn and utilize these technologies to receive their information on. Kale states,

> Some of them are you know even older than my parents' generation and there's just you know, they don't know how to turn on a computer so you know there's a huge gap there that I don't think it's even [pause] I don't know how you would bridge that for that generation in that level of producers so that's actually a huge problem.

The majority of the nine agents had participated in some type of technology training and were very positive about their experience. However, when asked about the benefits of technology training, Gerald a non-user, talks about his experience after the training was over. He was unable to utilize and try out the technologies and ended up forgetting how to operate the technology. He states,

> I've gone to things like the CMS training and like when 4-H online came about I was the only agent the office, so I had to attend that. There's been, there's been two or three of them I've been to but there again seems like you go to those and if you don't come home and utilize them, then you forget all about it you know? It, it just escapes you I guess it does me anyway.

Jessie, a medium user, admits that many new media technologies are not always user-friendly, especially for the older generations of agents. She empathized with the older generation and agreed it was frustrating for even her sometimes. Growing up in a "technological boom",

millennials grew up accustomed to learning the next new technology and never thought twice about it. This is not the case for the older generations. She states,

> It's not an entirely user-friendly format like it's frustrating and I can definitely see from the older generations that are still within our system and that have that content knowledge of just getting fed up with it and not wanting to deal with it when they would be adjusted to phone calls and email and other formats of communication. So I guess just the difficulty of the platforms themselves is a huge hindrance.

Kara mentions a specific time that an older agent was very willing to try a new social media platform and through one-on-one training she was able to get an account set up. However, after filming a live video upside down, she was more hesitant to use the platform. Kara goes on to talk about the benefit of having an option where older agents or agents who had never utilized a certain technology could practice or try it out in an environment that was not so permanent or stressful. Kara shares,

> For the most part, we have a younger team of agents, so it's been pretty good but then we do have one agent that has been here a long time, so it's been kind of tough to like [pause] she had never heard of Instagram. So, we had to help her to make an Instagram so she could get on and you know post pictures. So that's kind of been a struggle. One time she went live, and the video was upside down and stuff like so it's not that she's not reluctant to do it. It's just challenging, I guess.

Another agent brought up the point that the older generations do not understand the purpose of using new media technology. This lack of knowledge and understanding of the technology creates a disconnect and unwillingness to adopt and apply the technologies. Through education on the importance of new media technology and how it can help them in their profession, agents might be more willing to adopt the technology. Scarlett states,

> I think that some people in older generations don't quite understand why we need to use that particular platform, is one probably the biggest, one is people not understanding why we'd want to use that when we still have a newspaper and radio even though they are probably on Facebook they don't understand how many people probably get on Facebook. The other problem I see with social media is that there's so many other things out there cluttering your page [content] doesn't necessarily get even on their newsfeed.

Time was one of the biggest roadblocks mentioned in the previous literature. While it was not one of the major roadblocks mentioned in this study, it was referred to multiple times. Many agents alluded to the fact that they were busy, and new media technology had the potential to take up a lot of time that could otherwise be spent tending to other aspects of their positions. Kara talks about her struggle with time management when it comes to utilizing new media technology. She states,

> I'd say it does take up a lot of time and that's something I struggle with. Like I don't know how much time I should set aside to you know work on that stuff because videos and like our [office] manager takes a lot of time editing, doing like just the captioning, everything…takes up a lot of time and effort so I don't know where to draw the line between [pause] you know doing all that stuff and then also doing my research for newspapers and things like that or helping a client so just juggling that is difficult.

Kara, a high user, also mentions the roadblocks as being the platforms themselves. One well-known social media platform, Facebook, is constantly changing the algorithms that allow certain individuals to see targeted content. Agents agreed that this just adds to the complexity of new media technology and understanding how to get your content out and make sure the individuals being targeted are seeing the information. She states,

> The frustrations come in of learning to play with the algorithms that change on a regular basis or vision, like don't link to YouTube, don't link to another page period, don't do anything political because apparently telling folks to pick up after their pets is a political message that got shut down. So, it's, it's learning those algorithms and how they shift and so some of the helpfulness would be learned [pause] having frequent updates on how not necessarily how to bypass but how to work with those changing algorithms because Mr. Zuckerberg does not like to play nicely.

When looking at the relationship between complexity, trialability, observability and learning in regard to research objective three, why do Kansas agricultural extension agents continue to use new media technology in agricultural extension, a couple themes emerged. The majority of the reasons agents who currently utilize new media technology continued to use and increase their use of new media technology related to client interaction and outreach. Agents

responded well when they could see what they were doing had an impact on either their clients or other agents. Dean, a low user, had very recently opened an account with Facebook. He mentioned that while he was still getting used to making posts and interacting with individuals on the platform, he continued to learn and utilize the program because of the response he saw from individuals interacting with their office Facebook page.

A couple of the agents mentioned that they enjoyed utilizing new media technology because it allowed them to interact with their clients in a more comical, less serious manner. They got to know their clients on a more personal level through interactions with humorous posts on their Facebook page. Abby recalls one post in particular that allowed her to have fun with her clients,

> One post I'm thinking about that was circulating Facebook for a while is one of those birthday posts where you find the month and it says something, the month you were born in and you find the day and it says something and it was really funny. It was what do you ask your extension agent and they were random things like 'my cow has something wrong with its foot' and then it's like 'could this be mushrooms?' They were nonsensical funny stuff, and we got a lot of comments on that and that was actually a lot of fun because that was one of the rare times were we got comments and a lot of the agents in the office were commenting back to people they knew whether it was volunteers or their friends and just because. I also said something like 'tag your agent,' and so maybe they would say like our 4-H agents name, one of her friends would write it and then our 4-H agent would write back… 'I'm never going to answer that question' and so that was a really fun way that it kind of seemed like everybody in the office was participating [pause] interacting with people in a way that I hadn't seen before. But that was one post. So, we need to do more of that, but it was definitely more of a casual relationship than we see but I think one that I hope our clients really enjoyed.

Abby also mentions that she not only continues to use new media technology to benefit her clients but also to help other agents. She realizes that older, more reluctant individuals may need to be shown the benefit of using new media technology before they will consider using it themselves. By getting more agents involved in new media technology adoption, extension can stay relevant and reach a broader demographics of individuals. Abby states,

> I would love, love, love to show more follow-through. Look, we had 10 more people come to the program or whatever it is to kind of say [pause] to show that person this matters and so you should make time for it.

Other agents continued to utilize new media technology in an effort to not only stay relevant but to further their own adoption of newer medias in an effort to help their clients and reach a broader audience. Kale talks about his desire to follow in the footsteps of their multi-county specialist and start producing small educational videos. After witnessing the success of the others videos, he thinks it would be a great asset to his clients and hopes to further pursue this passion. Kale states,

> I would love to start doing, in my position, is start making short video clips on you know soil sampling or um just kind of like a quick tutorial on really anything and [pause] [A Multi-County Specialist] does that and she's our Northwest Regional specialist in agronomy. She does a really excellent job of taking short [videos] you know they're professional, they're not maybe the highest quality, but it's still another way to interact with the public that I think would be really valuable. I just haven't had the time to sit down and start.

Agents also noted that they continue to use new media technology for self-improvement. They see the benefits of implementing new media technology in extension and realize learning the "ins and outs" of the technology take time. It is something they have to work at every day and continue to use in order to reap the benefits of the technology. Abby discusses the state her office is in and notes the effort they are making. She also talks about their future plans to utilize new media technology once they feel comfortable with the platforms they already have established. She states,

> We need to kind of get good at the tools we have before we expand, but…it would be silly to not keep our options open. We've talked about within horticulture, within the horticultural agents, doing a blog, we've talked about doing Instagram, but right now it's just so we're all kind of fledgling so we're still struggling a little bit. But I think any [pause] anything that would be new media technology I would be open to. I think everybody in my office would be open to trying it and at least keeping it as an option.

The relationship between executing and components of Argyris and Schon's model

The relationship between execution and components of Argyris and Schon's model: governing variables, action strategies and techniques and results and consequences, in correlation with Kansas extension agents' willingness to adopt new media technology, emerged as the third most mentioned theme throughout the semi-structured interviews. This theme, while it did not fully answer all three research objective questions, helped shed light on what agents do in terms of using or not using new media technology, how they use it and why they do it. When referring back to the holistic model in chapter 2, the portion that makes the act of adoption a cyclical process instead of a linear model like Rogers's, is the section that pertains to Pietersen's executing a plan and Argyris and Schon's model. This section of chapter 4 highlights that cyclical process and provides a better understanding of how agents execute adopting new media technology.

The reasoning as to why agents utilize new media technology was already established in the beginning of this chapter. Agents' main reasoning for using or not using new media technology was driven by their clients' needs and demands. How they execute the use of new media technology however, will be discussed in detail in this section.

While the overall consensus about the use of new media technology in Kansas agricultural extension was positive amongst all agents, there was a vast majority of differences in the execution of new media technology between the different levels of users, as well as between the counties. The new media technologies being used differed from agent to agent. The non and low users tended to integrate less technology into their jobs, while the medium and high users tended to use multiple platforms to engage their clients and perform their job duties. While a definition of new media technology was read to each participant at the beginning of the study,

almost all agents focused the majority of the conversation on social media as the main new media technology they used. Agents mentioned a wide range of technologies, from popular social media platforms to email blasts and text images. Kara, a high user of new media technology discusses the main new media technology she utilizes in her profession. She states,

> So, in our district, we've really worked hard to be online and have a social media presence. So, we do have a Facebook page and we have a Facebook group, we have an Instagram and Twitter…we try to, we try to be on all the platforms. But [I am] not sure how effective it all is.

Dean, a low user, talks about how a good portion of communicating with his clients is done through email blasts rather than social media. He states,

> I send out a lot, I don't know if you call it new media, but I use email blast to, to reach a lot of my producers and that's probably where I get 50 percent of my contacts or reports back is from an email blast that I sent out to my producers that I will get responses from I use that for whatever we have alerts like a bug in a, in a field or you know something's going on so, but they need quick, quick reaction to.

Just like the platforms in which agents communicated with their clients differed, so did the ways in which the agents incorporated and managed the new media technology into their daily tasks. Some agents mentioned the use of an office professional taking over the social media sites, while others divided up the tasks amongst themselves in the office. Individuals who utilized an office professional to manage all social media accounts spoke very highly of this approach to incorporating new media technology. Kara discusses the benefits of having one individual to manage all of the accounts. She states,

> We actually have a social media manager. So yeah, we've, we've gone to a lot of the new media marketing trainings and… [worked with] the Center for Rural Enterprise Engagement…it also gives us like one voice kind of because if I make a post it's gonna sound different than if you know our nutrition agent makes a post because her and I you know we, we have different professions kind of and we sound different but if we each give our content to our manager and then she puts it together it all is uniform and it all looks the same and so, I mean I still want people to know it's coming from me. But also, it's it all looks nice and organized.

Wayne, a non-user, talks about how he directly benefits from having an office professional there to help him get his information out to the public without having to actually learn and utilize the platform. A lot of the non and low users mentioned a blatant lack of interest in learning a new technology despite understanding the purpose and need to get their information out via these technologies. Wayne states,

> I usually find the information and pass it on to my office professionals who are more technologically savvy than I am.

Other agents took more of an 'every man for himself' approach to running their new media technology accounts. Abby talks about the structure in her office and how they operate without an office personnel. She states,

> There're six agents in our office including our director. All of us are either posting or like I post for our ag agent because he doesn't have a Facebook so we're all either posting or we're responsible for somebody else's posting so that we're all contributing content.

This approach was most common amongst the agents, however, multiple agents noted that the use of one or two office professionals would be a great benefit to have. Agents gave reasons for not having an office personnel, such as their office could not afford to pay one, everyone in their office was already happy managing his or her own account, or their office professionals did not have an interest in running their social media accounts.

When it came to actually sitting down and managing their new media technology accounts, there were again multiple approaches to doing so. Some agents shared a universal account to keep things simple for themselves and made it easier for their clients to go to one place to find information, while others each had an account for every agent. Jessie talks about the struggle to keep the page active even when all the agents are utilizing one. If they were to have separate pages, Jessie did not think that there would be enough content to keep clients happy or engaged with the page. She states,

> So we don't have individual pages for like the different agents so it's all a office based programming so 4-H has its own page but they also have a lot more content that comes out regularly but we all share a [county K-State research and extension page] and that's where all of our push comes out and we struggle as it is to try and find content push out on a daily basis.

A lot of agents voiced the same concerns about being able to keep the content abundant and relevant. The agents knew that in order to keep a captive audience, they had to be regularly posting content. Many of them struggled in this area due to different reasons, such as time, more pressing matters, or a lack of interest. Abby talks about how she combats a lack of interaction with her new media technology by treating it like any other task she has to complete for her job. Rather than looking at it from the standpoint of if I have time, I will get to it, she includes it in her to-do lists, so it is sure to get done. She states,

> I think for the most part it's, it's just kind of like any other part of the job. Remembering to do it, finding the time to do it, and doing it in a quality way. But I look at it just like I look at other parts of my job. I write an article for the newspaper and that's kind of a checkbox. I put a post on Facebook checkbox. I…you know [I] need to upload a new form or flyer to our website I just kind of look at it like the tasks of my other job. So sometimes challenging but not any more so than anything else I have to do.

Technology is forever adapting and changing, from agricultural advances to communications technologies. When combining agriculture, education and communications in one profession, it is imperative that advancements are being made in the way agents reach their clients and disseminate information. Through the semi-structured interviews, it was made apparent that all groups of users were making or thinking about making an effort to better their channels of communication. While some agents were at the stage of thinking about implementing new media technology, others were looking to add more technologies to their current programs. Gerald, a non-user, talks about his experience with setting up a web page for the local patrons to get information that is pertinent to their location. He states,

> I've tried to set up a local web page for agriculture and when I hear cultural wildlife all the things that I deal with so that I can put information that's more locally pertinent. I guess that's on that website and make it easier for our local residents maybe to go there for information.

Jessie, a medium user, who regularly uses new media technology in her position, talks about how after seeing the benefits of Facebook, she decided to expand their use of new media technology and adopt Twitter. She noticed the local news was very prevalent on twitter and by interacting with them via social media, they would be able to reach a demographic that may not know a whole lot about extension services in a more suburban area. She states,

> We added the Twitter page and a lot of that was the discussion of the media in the area gets their info from Twitter and so if we're able to cross pollinate into a little bit more, we can get the media into our office more. We've got a good relationship with newscasters in the area, we probably have interviews with their folks I'd say probably three to four times a month in our office. I know I've had six or seven interviews in the last year on random topics with regional news sources and that's not something that you commonly see across the state potentially in Sedgwick County or Shawnee but it's learning where your target audience is and that's why we decided to implement Twitter.

Kara, a high user, talks about how they have implemented multiple social media platforms in order to engage multiple demographics of clients and also keep up with the trending technologies. She states,

> I think the first thing [our county extension] had was Facebook and I think that's just kind of the biggest one to do, and then I think our most recent one was Instagram. I think they're trying to reach the younger audience or something, and then actually around fair time we made a snapchat account. I know our 4-H agent kind of works with that and she let them get on there and we actually had like a filter for the fair.

Medium and high users of new media technology were more likely to use a new media technology, recognize the benefits, and consider adding another technology to the mix when compared to non and low users. The more benefit the medium and high users saw in technology, the more willing they were to increase the technology use, and the more likely they were to adopt and stick with the technology. The non and low users seemed to be more content with utilizing

one new media technology and had trouble discerning how the technologies intertwined and cross-pollinated to gain more advantage. Dean, a low user, talks about how his office started a Twitter account, but they could not see the benefit of using it and ended up rejecting the technology as a whole. Dean brings up the point that if you are not reaching a targeted audience, the new media technology might as well be obsolete. He states,

> I've seen what K-State puts out from the university level, this is just what I heard I don't have a Twitter following but from what I was talking to other, other employees as they watch K-State throw out stuff on Twitter or the Agronomy Department, and I'm not faulting them, but the only people following them are other K-State people. So are we reaching the producer or our clientele and our stakeholders is what I wonder but it seems like everybody has a Facebook account so but we don't even mess with Twitter we started one and we dropped it so we're just strictly pretty much Facebook and email here at this office.

Aside from how agents implemented technologies and what technologies they utilized, agents also mentioned things they had learned through various trainings they had attended. Many agents noted they executed the way they utilized new media differently because of the trainings and were pleased with the results they were receiving. One agent mentioned that time always seemed to be an issue but learned through training to just take five minutes a day to make a presence on social media. Abby recollects what she has learned through new technology trainings and how they have changed the way she operates their social media accounts. She states,

> As an office we have been attending a lot of social media trainings and we're looking at how we want to use our different platforms. For Facebook one thing we were just kind of like [pause] So my program area is horticulture, maybe I would see an article about bees that I thought was really interesting and share that and we really weren't getting a lot of attention just, just sharing sort of resources. So, we've sort of pivoted and have tried to be a little more fun with our Facebook page. I think it was, it was a few weeks ago that me and another agent drove the 4-H exhibiters to the State Fair, so we took a selfie and we're just like, you know, we've got our coffee, we've got our playlist we're ready to go! And I got a lot of attention. Not really content, but just kind of letting people in and letting them get to know us and so kind of what we're trying as an office strategy is to be fun most of the time and then every now and then when people are listening or when we get people to

> listen kind of slip something in that's like also come to my program at the library. So, we're trying to do that a little bit differently. Our website is, is very factual. That's where publications are posted, that's where fliers are posted, it's more we may have something fun on our Facebook, but then also include a link to our website that has more of the need-to-know information okay.

Abby also goes on to mention her further success with attending social media trainings and states,

> After social media training they just kept hammering into us videos, videos, videos and so we did a video with one of my extension master gardeners and he just did a short video saying, kind of mentioning his program that was coming up, and it got like over 500 views is what Facebook told me but when within his program he asked how many of you came here because you saw the Facebook post and nobody had and so I think that's something I'm still working on is how do we get those views to translate to actual clients and not just people that saw it and thought oh that's nice, but didn't actually come to hear the good content that we really wanted them to hear?

Agents spoke very highly of all the new media technology trainings they had received and were more than willing to attend and receive the training. Many of them spoke on the mini successes they had accomplished by manipulating the ways they utilized the different platforms, either by adding a video or making the post more personal with images of themselves doing fun things. The agents were more likely to continue the education and adoption of new media technology if they could see what they were learning in the trainings transfer to success in their pages.

Single-Loop Learning vs. Double-Loop Learning

Another aspect of Argyris and Schon's Model that was applied to how agents went about adopting new media technology was whether they were more likely to adopt a technology if it required single- or double-loop learning. According to the literature, single-loop learning is when an individual's intentions do not meet their intended outcome. An individual's natural response is to look for another strategy, and this is referred to as single-loop learning (Greenwood, 1998). An individual can go a step further and encounter double-loop learning, where an individual questions their governing values instead of searching for a new strategy (Anderson, 1994).

It was a unanimous opinion that agents preferred single-loop learning over double-loop learning when it came to adopting new media technology. Because technology is so abundant and constantly changing, agents could easily look toward another technology or attend a training to help them better utilize a technology they were already using. Abby discusses her plan of action if she were to implement a new technology and was unable to get it to work in the way she had intended. Instead of reevaluating extension's governing values, she would simply ask for help on how to utilize the one she was currently using. She states,

> I would probably reach out to somebody that uses it. You know, like I said, we have another person or office who loves Instagram. She's obsessed with it. She uses it all the time so if we went to Instagram and I felt like we were missing the mark and our posts weren't doing as well or I'm struggling with it, I'd probably go to her. Even just people I know my husband doesn't care at all for Facebook and he lives on Twitter and I don't get that, I don't understand Twitter. I just don't like it, but I would probably go to him. But even within extension we have a lot of people [pause] [extension specialist] is excellent. She's part of the Center for Rural Enterprise Engagement, she's really excellent in social media and we just have a lot of I think really excellent people.

Many other agents followed in Abby's footsteps and voiced that they too would much rather take the simple route that took less time and effort than go back and reevaluate the whole entire system. Kara states,

> I think just you know, trying and making an effort to keep posting and keep bettering yourself to these classes and workshops are really important.

Because agents saw the need for new media technology and had abundant access to new media technology trainings and a plethora of technologies to choose from, they were far more likely to choose an option that required single-loop learning than they were to choose an option that required stepping back and reevaluating the operation as a whole like in double-loop learning.

Other Relevant Findings

Although this research was analyzed using deductive analysis and the themes were predetermined, ethics was a new theme that came through quite prevalent. Ethics was mentioned by every user group except the non-users, though this could be due to a lack of knowledge surrounding new media technology. This theme had not come up in previous literature but was mentioned several times throughout the semi-structured interviews. While the agents called it ethics, it appeared to be more of a morality issue than an ethics issue. The Webster Dictionary (2011) states that while the ethics and morals are commonly used as synonyms, there is a distinction between the two. Morals are often the values concerning one person in particular's beliefs of what is right and wrong and can include subjective preference, while ethics are broadened moral principles that usually refer to a universal fairness of what is relatively right and wrong (Hacker, 2011). While agents specifically referred to the action of new media technology being right and wrong as "ethics," it appears to be more connected to their personal morals. Because the participants referred to the rights and wrongs specifically as "ethics", the researcher will continue to refer to them in that manner. Agents viewed ethics and new media technology as a double-edged sword. Many agents spoke on the crisis of misinformation that happens on social media and new media platforms and deemed it as an incentive to adopting new media technology in order to be aware of the situation and a solution to combating the misinformation. Dean talks about the pros and cons of implementing new media technology. He states,

> Facebook you know there's pros and cons to Facebook, for every good bit of information somebody else is throwing out there something that's false. Fighting the false reports and stuff like that is a hindrance here, if we don't put it out there somebody else is going to put out misinformation so we've got to be there and show them from a research point of view, from a factual point of view, that this is the way life really should be and is

> compared to what you just feel like is in your heart because feelings can come from bad chili so, so I think that's where we need to be very proactive.

Kara also speaks very passionately about being sure extension agents are utilizing these platforms to ensure clients and individuals are getting the right information and a proper education. She states,

> Social media would be a big part of it. I think that's how a lot of people get their education nowadays it's just kind of sad because sometimes it's not always reliable so I think that's something that as an extension agent we're trying to focus on is getting reliable information on to platforms like Facebook and Twitter and Instagram and making them available to our clients.

Tom continued the conversation of ethics and was unsure himself of the information he obtained from various sources online. He also mentioned the topic of oversharing and worried that individuals would get the wrong image of agriculture if the whole story was not shared correctly. He states,

> I guess I'm somewhat skeptical or just need to know the source to know the accuracy of the information, I think it's, it's more of can we can we keep things positive can we keep things professional, I think at times we just need to be careful about what we put out there for the world to see.

Summary of Findings

This chapter provided the findings from the study. Due to a lack of information pertaining to new media technology use in Kansas agricultural extension, the findings provided a solid base of knowledge for understanding what drives Kansas agricultural extension agents to adopt new media technology and builds a foundation for future research.

Three primary themes and two secondary themes emerged from the data collected through semi-structured interviews. The 5 total themes consisted of:

1. The relationship between relative advantage, compatibility, focusing and aligning
2. The relationship between complexity, trialability, observability and learning

3. The relationship between executing and Argyris and Schon's model.
4. Single-loop vs. double-loop learning
5. Ethics

These five themes are the driving force behind Kansas agricultural extension agents' willingness to adopt new media technologies.

Overall, the participants that partook in the semi-structured interviews were a well-balanced representation of a Kansas agricultural extension agent. There was nearly an equal representation of males and females, and they represented all sectors of agriculture extension, horticulture, agriculture and natural resource, 4-H, crop production, and livestock production. All of the agents were more than willing to participate and were highly interested in the outcome of the study. Both non-user participants were shocked to be selected for an interview about new media technology and were concerned they would be of no help, but both provided insight into why they had not adopted new media technology and what it would take for them to do so.

Theme 1: The relationship between relative advantage, compatibility, focusing and aligning. The number one reason agents identified for adopting new media technology was to reach their clientele. If agents were trying to reach a younger demographic or a more urban demographic, they were more likely to adopt technologies to be able to better reach those individuals. If an agent worked with older clients who still received their information from a newsletter or emails, they were less likely to see the benefit of new media technology and less likely to adopt the new media technologies.

Theme 2: The relationship between complexity, trialability, observability and learning. After agents considered their demographics, agents then looked at the level of difficulty the technology possessed. The more difficult the technology, the less likely the agents

were to adopt the technology. Agents explored ways to reduce the complexity of the technology by observing others use it, trying it out for themselves, and then being able to learn about the technology through trainings or instruction.

Theme 3: The relationship between executing and Argyris and Schon's model. While the overall consensus about the use of new media technology in Kansas agricultural extension was positive amongst all agents, there were vast differences in the execution of new media technology between the different levels of users, as well as between counties. The more technologies an agent used, the more likely they were to continue to adopt the next new technology that came along.

Theme 4: Single-loop vs. double-loop learning. Agents, by a unanimous vote, were more likely to adopt a technology if it required single-loop learning rather than double-loop learning. Due to the abundant technologies and trainings, agents found it more appealing to take the simple route of changing how they approached a technology, rather than change the governing variables of their extension program.

Theme 5: Ethics. Ethics was not a predetermined theme but appeared multiple times throughout the semi-structured interviews. It was both a deterrent and an incentive to drive technology adoption. Agents feared the responsibility and permanence of the material they published on new media technology, which deterred them from adopting new technologies. At the same time, however, they saw new media technology as a way to combat misinformation and properly educate misinformed individuals. This was a catalyst for the adoption of new media technologies.

Chapter 5 - Conclusions, Implications, and Future Research

Introduction

This chapter summarizes the findings and discussion in Chapter four. The purpose of this qualitative study was to explore Kansas agricultural extension agents use of new media technology to provide an increased understanding of how Kansas extension agents can realistically and effectively implement new media technology in their roles as agents. The findings of this study are not generalizable to all of extension but can help to provide groundwork for future research in this area. While much of the past research has focused on the use of social media in extension, this study focused on a broader term of new media technology, as the researcher found very limited exploration in this area and felt new media technology important for extension's success. The researcher used a deductive approach to qualitative analysis, looking for pre-established themes throughout the data. This study provided a greater perspective on how Kansas agricultural extension agents are implementing new media technology into their work as agents and identified solutions to increase new media technology adoption in Kansas agricultural extension. The following chapter looks at the broader conclusions from the study surrounding the three primary research questions, and implications for extension's future adoption research.

Conclusions

The interviews provided an in-depth look at various levels of new media technology users and how they each viewed new media technology as it pertained to their job. With very minimal previous research on agents' use of new media technology, this study has provided a foundation of research on this topic and a better understanding of how agents choose to adopt

technologies. The following is a conclusion of the results as they relate to the three research questions presented in Chapter One.

Three research questions guided this research and helped the researcher gain insight on new media technology and its involvement in Kansas agriculture extension agents' positions.

RQ 1: What elements foster adoption of new media technology in agricultural extension by Kansas agents? Three condensed themes of the holistic model used to guide this research became prevalent in fostering adoption. The first theme of four components from the holistic model that were the principal driving force towards agents' technology adoption were relative advantage, compatibility, focusing and aligning. These four components, from two of the three models, are closely related and looked at how the technologies benefited the agents. Agents were more willing to adopt the technology if there was an advantage to using a certain technology, this advantage usually meant their clients were receiving information from that technology. Agents wanted to focus and align the technologies they were using with the ones their clients were using. This was the case across all four user groups. If their clientele was not using the technology, then the agents were far less likely to adopt it.

However, some situational differences did exist. Non-and low user agents stated that if their clients were using a technology, they would of course use it, but they would be less than thrilled to learn a new technology. Medium and high users were much more inclined to try a technology if they had previous success with another one. Another aspect influencing adoption was agents' locations and the type of clients, which was a greater proponent to adopting technologies. Agents working in more urban areas said they tended to have a younger clientele who favored receiving information via new media technologies. These agents were more than willing to adopt technologies and viewed it as an opportunity to reach a broader audience and

stay relevant. Agents who worked in more rural areas talked about having an older clientele who was not always keen on receiving information via technology and preferred receiving information through older, more traditional channels of communication like the newspaper or flyers. These agents were not as eager to try out or adopt new technologies because it would not be compatible with nor useful for their clientele. Job responsibilities also played a factor in technology adoption. Agents who also worked with 4-H youth incorporated a lot more new media technology into their program and were more active on various new media platforms compared to agents who did not work with youth development programs.

The second set of elements from the holistic model that increased agents' willingness to adopt new media technology were complexity, trialability, observability and learning. These four components, from two of the three models, looked at the process of learning a new technology. Agents were more willing to adopt a technology that possessed a low level of difficulty combined with the ability to be observed, manipulated and accompanied by trainings.

All user groups' willingness to adopt a technology increased when they were able to experience success from either their own use of a technology or the use of others when utilizing the technologies. The medium and high users talked substantially about their own success with certain technologies driving them to increase their technology adoption. If they could see how the adoption of a technology converted into quantitative measures, such as an increase in meeting attendance based on the clientele seeing a new media post about a meeting, they were more likely to adopt another technology. Low and non-users were more likely to adopt new media technologies if they could see success their co-workers or other extension agents were having with the technology. Non-users, especially, needed to observe a direct benefit of using the technology before they were willing to adopt it. Along with low complexity and high

observability, being able to attend trainings and see the technology in action also increased agents' willingness to adopt technologies.

The final components from the holistic model that encouraged agents to adopt new media technology were execution and components of Argyris and Schon's model. These model aspects focused on the actual process of technology adoption rather than the individual components of technology adoption previously discussed. Like much of the previous literature stated, time was a major component of consideration when it came to adopting new media technology (Diem et al,, 2009). Agents talked about already being pressed for time and did not want to adopt something that would take up more time if the benefits did not outweigh the negatives. When looking at Argyris and Schon's model pertaining to the aspect of single and double-loop learning, all agents described they would be more willing to adopt the technology if it included elements of single-loop learning, a simple way of looking for another strategy to combat a problem when adopting a technology, versus double-loop learning, which entailed reevaluating the entire situation.

When it comes to fostering the adoption of new media technology, clients are the main influencers that drive agents' desire and willingness to adopt new media technologies. It is important to consider there is not a "one-size-fits-all" approach to fostering the adoption of new media technology in extension, as there are many factors that come into play. These factors include age groups, differing positions and job duties, and all play a role in the speed and magnitude of adoption in new media technology. This is important consider when creating trainings and solutions to overcoming roadblocks.

RQ 2: What roadblocks prevent the implementation of new media technology in agricultural extension? There were a multitude of roadblocks mentioned that interfered with

agents' implementation of new media technology in extension. These roadblocks included time, personal attitude, efficiency of communication, inconsistencies in new media technologies, and ethics. Time and personal attitude aligned strongly with theme one (the relationship between relative advantage, compatibility, focusing and aligning) as they both have to do with the "fit" of a technology creating a disconnect and an absence of adoption. Efficiency of communication and inconsistencies in new media technologies aligned with theme two (the relationship between complexity, trialability, observability and learning) as both roadblocks deal with the lack of functionality and practicality of new media technology when it comes to not adopting the technologies. The last roadblock that will be discussed refers specifically to theme five, ethics. Ethics was an emergent theme that appeared throughout the semi-structured interviews and was a big reason for not adopting technologies.

Roadblocks pertaining to theme one dealt with a disconnect of the technology in some way that did not foster a positive relationship between the agent and the task needing to be completed via the new technology. Time was the only roadblock from this study that reinforced previous studies, which found time to be a leading roadblock to implementing new media technology. Agents in all four user groups mentioned implementing new technology took up valuable time. Time was used up in education and trainings about the technologies and also having to come up with content, post the content, and interact with various new media technologies. This was a major factor in reluctance to adopt technologies.

Agents' personal attitude toward technologies was another leading roadblock for adoption. Negative personal attitude was more prevalent in the non- and low users when compared to medium and high users but common in agents who did not classify themselves as millennials. Agents' negative personal attitudes mainly focused on the fact of having to learn a

new technology in general. While all agents agreed that new media technology could be beneficial to Kansas extension, that was not enough for agents to adopt new media technologies.

Roadblocks pertaining to theme two dealt more with the technology itself and where the technologies fell short in functionality and practicality of the platforms. Agents wanted to utilize technologies that were quicker and easier to use and learn, and when this was not the case agents strayed away from adoption. Efficiency and accuracy of communication was another roadblock brought up by agents. When it came to communicating with clients through new media technology, agents had problems with the platforms. Agents worried they were not reaching the individuals they were trying to target and also feared the content they were disseminating was not resonating with the audience like they had hoped. Other agents discussed the generational divide that is happening and had a hard time reaching both the younger and older generations with the same technologies.

Another roadblock that was found in this study was the inconsistency with new media technology. Many agents disliked the frequently changing platforms and found it extremely difficult and frustrating to use. When it came to agents utilizing the platforms themselves, they mentioned their own inconsistencies of posting information and content on the pages and also the inconsistency of the level of users implementing the technologies. Some agents had attended various trainings and were very knowledgeable on the platforms while others had never heard of some of the platforms. This divide in users meant some agents had more responsibilities then others when it came to keeping the pages running.

The last major roadblock identified in this study was ethics. Ethics was not a pre-established theme the researcher was looking for but was mentioned many times throughout the interviews. Agents worried about the types of information being published on new media

technology. They saw new media technology as a way to disseminate incorrect information fast and to a very vast audience. Individuals also spoke about using new media technology appropriately during work hours. While this was not a known problem in extension and no agent specifically stated it as a roadblock, many agents mentioned their board members saw it as a potential distraction to other job duties.

While many roadblocks were mentioned throughout the semi-structured interviews, few solutions for the roadblocks were discussed. The most frequent solution to the roadblocks was to implement an office professional or media manager to be in charge of all the new media technology platforms. Many agents felt this would help eliminate inconsistencies, help with branding, and give one voice to each office. The agents stated they would still be in charge of getting the information to the office professional or media manager, but that individual would be in charge of scheduling and creating the post. Another solution mentioned was simply more training. Most agents agreed they just wanted to know how the platforms worked and how to best utilize the platforms they were using.

RQ 3: Why do Kansas agricultural extension agents continue to use new media in agricultural extension? For the agents who regularly implemented new media technology in their daily routines, they all had similar responses as to why they continued to utilize and further adopt newer technologies. The foremost reason for the continued use of new media technology was its ability to disseminate information effortlessly and in a timely manner. Once the agents had surpassed the learning curve associated with adopting technologies, they appreciated the simplicity new media technology could add to their jobs.

Another reason agents continued to utilize the technologies was to be able to communicate in real time with individuals of all age groups and especially be able to reach a

younger audience. The last reason given for the continued use of new media technology was the ability to see instant impact of what the agents were doing and who they were reaching through the built-in analytics of the program. Agents really liked the ability to see progress in what and who they were reaching.

Implications

Extension agents have the platform and resources that allow them to educate a multitude of individuals and also have access to unlimited new media technology platforms. The biggest question the researcher set out to answer was why Kansas agriculture extension agents were choosing not to use these new tools to reach and educate individuals. The findings of this study, when it came to the established roadblocks to implementing new media technology, were only somewhat consistent. Diem et al. (2009) found the main roadblocks to be time, money, and training, while Kinsey (2010) adds that increased workload and learning the new technologies also attributed to the lack of willingness to adopt these technologies. However, the main roadblocks that were found in this study included, time, personal attitude, efficiency of communication, inconsistencies in new media technologies, and ethics. The change in circumstances as to why agents had not adopted new media technology could be due to more familiarity with the different platforms and the advancement of the platforms themselves.

While identifying roadblocks was one of the main objectives, this study highlighted other aspects of the collaboration between extension and new media technology that was not found to be discussed in previous literature. During the semi-structured interviews, a couple of the agents brought up the fact that there are many small agricultural businesses who utilize new media technologies to market and sell various agricultural products online. While the agents saw how extension could greatly benefit from new media technology, they brought up the point that they

are not selling a product, their information comes free. The agents explained that people grew very weary of the abundant source of information because of the fact that it is free. When individuals turn to the internet to get information or products, there seemed to be an implied worth that the more things cost the more value or truth they hold. Agents found it difficult to connect with individuals who were not familiar with extension as they were weary of the free information from an online source. While some of the agents felt their free information was viewed unsound, YouTube is a prime example of how this is not necessarily true. Many individuals, including some of the agents in this study, turn to YouTube, a free platform, for educational material and find it to be extremely valuable information. This disconnect between agents' information and future clients is something that could potentially create issues in the future and should be addressed in future research.

The results of this study not only highlighted implications for the use of new media technologies and why agents were hesitant to adopt technologies, but it also lent more information and insight as to how a better model for technology adoption in extension could better be addressed. The findings of the research suggest that by combining and condensing the three models, the creation of a new, simpler, holistic model (Figure 5) would better suit new media technology adoption in extension.

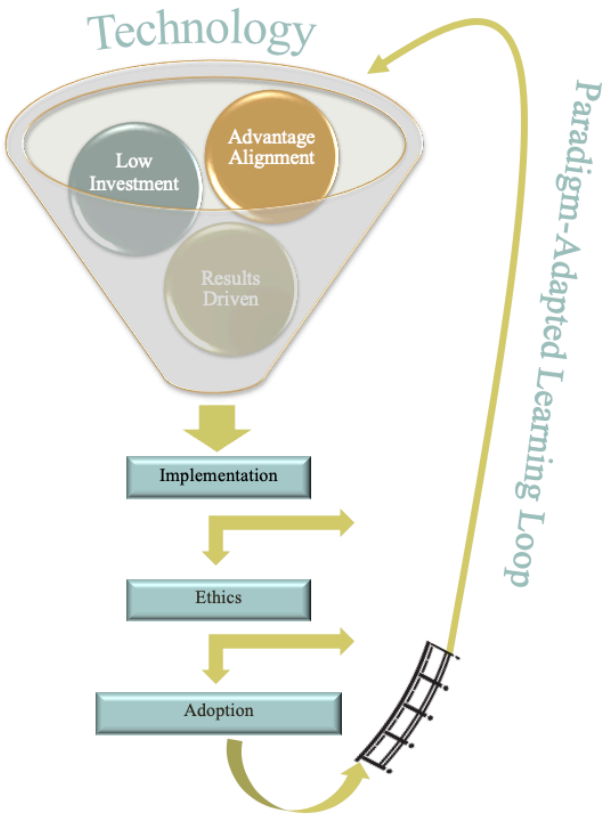

Figure 5. *Revised Holistic Model to Technology Adoption*

The first component in the model is the funnel that contains alignment advantage, low investment and results driven. If all three of these attributes are present in a technology, then the rate of consideration for adoption is significantly increased. The first element, alignment advantage, is the ability of the technology to compliment the individual's main focus. In the case of extension agents, their main focus is to provide information to their clients. Therefore, the technology needs be able to deliver the information in the way the agent intends it to be delivered, and also be able to reach the individuals for whom it is intended. If agents' clients are not utilizing the technology, they will more than likely not adopt the technology. The second component is low investment. The technology must be fairly easy to observe, learn, use, and

teach. Agents are more willing to adopt a technology that requires a low amount of input in the form of time, money, and education. The last component is results driven. In order to adopt the technology, agents want to know how it will benefit them in the long run. Agents, after adoption, also want to see quick and positive results. Agents were driven to adopt more technologies based on the success of the first technology or were willing to stick with the adoption of the first technology, given they had positive results. Positive results could come in the form of more clients attending meetings or more interactions on their social media pages.

A technology that incorporates all three elements will move down the funnel and result in implementation, however this is not the final step. Once technologies are initially implemented, they are then filtered through and ethics lens. If the technology holds to be ethical, technology adoption will be more deeply seeded. However, if the agent finds the technology to be unethical in any way, they will reject the technology. Once a technology is rejected, which can occur at any point, the agent will then enter the paradigm adapted learning loop. Here, the agent will reevaluate the technology previously considered and will look for another technology that is better adapted to their set of circumstances. In Figure 5., the bridge in the model depicts that once an individual adopts a technology and has entered the paradigm adapted learning loop in order to evaluate the use of another technology it is necessary for an individual to be confident in the technology, and bridge the gap for individuals still using the older technologies. In extension, agents should play a critical role in helping bridge the gap between older and newer technologies. This includes helping users of older technologies understand the benefits and purpose of the newer technologies. However, if agents are too quick to move from technology to technology, they may

lose clients, and their position as an influencer in the community. Agents need to recognize the importance of giving individuals time to transition to a new technology. An allotted time limit should be given to allow individuals time to acclimate to the new technology and permit the "late majority and laggards" to follow suit. Extended transition times will also allow agents time to evaluate and adjust to the newer technologies, in order to prevent overlap in work load and duplication of technology ouputs associated with a collection of technologies as the adoption process moves forward. This loop incorporates the cyclical process that is lacking in Rogers' model and is important to include in the new model because it takes into account the continuous growth and advancements in technology.

Limitations

The study's sample size of nine participants poses a potential limitation to this study. Guest, Bunce, and Johnson (2006) propose that saturation often occurs around 12 participants in homogeneous groups. While an attempted census of 98 Kansas agriculture extension agents was taken to identify participants for the user groups, a total of 12 participants was unable to be met. Only one individual was in the high user group and only two individuals were in the non-user group. All other agents were in either the low or medium user groups and were able to be randomly selected to fulfill the 3 group members in each group.

Qualitative studies are more in-depth and allow the researcher to probe for information (Yilmaz, 2013). However, further probing and questioning is left up to the researcher. This is the researcher's first time conducting qualitative research and semi-structured interviews. This callowness could have possibly led to influenced outcomes based on the researcher's

inexperience with conducting interviews and asking questions. To prevent any skewed data, the researcher tried to educate herself about the interview process and refrained from using leading questions in order to get the participants' true feelings and opinions on the topic.

While qualitative data provide great in-depth analysis of a situation or person, it does not allow for bias to be completely removed from the research process. Another potential limitation to this study could be researcher bias. While the researcher chose this topic because of her passion for agricultural education, she did her best to stay unbiased throughout the study.

The last limitation to this study was the participants themselves. The researcher specifically looked at Kansas agricultural extension agents, as she had an interest in working in agricultural extension. The researcher did not look at other areas of extension nor look at extension in other states. This data cannot be generalizable to all extension agents, making the findings limited to that of Kansas agriculture extension agents.

Recommendations for Practice

The results of this study highlight why and how Kansas agriculture extension agents adopt and utilize new media technology. As new media technology becomes more predominant in the future of extension, this study sheds light on how to better acclimate agents with the new media technology in order to have a greater adoption of new media technology. It is very apparent that the rate and success of adoption of new media technology is extremely situational in extension depending on clients, job location, position, and technology. However, all agents viewed new media technology as a fairly positive change in extension. There is not necessarily a backlash when it comes to using the technology in Kansas extension but more of a lack of information about the technologies and a disconnect of how they benefit the agents.

This study can serve as a base for future trainings about new media technology to extension agents, that will help to increase the rate and willingness to adopt new media technology through extension. Agents first and foremost adopt technologies based on client demand. This could indicate future trainings need to take into consideration the location and position the agents have and what kind of clientele they are working with. Trainings may need to be more diversified and specified to fit all the agents' needs.

New media technology needs to become incorporated into new agent training in order to become a required job obligation in agents' positions. If agents were expected and trained on new media technology use as a part of their job description, when they are first hired, the rate of adoption could potentially increase as agents would no longer view new media technology as an increased workload but rather a fragment of their job they are supposed to complete.

Agents were highly driven by observing others and seeing positive results come from their efforts when using new media technology. A lot of the agents mentioned some counties had utilized an office professional to be in charge of the offices' various new media technology accounts. A good start to implementing new media technology in extension offices could begin with identifying one member of the extension office, such as an office professional, to be in charge of running the accounts. This individual could provide monthly meetings and trainings to the agents in the office so they could observe how things were run and how they would potentially benefit from these technologies. After observing how the platforms were and the success they created, other agents might be more willing to adopt new media technologies.

The research also lends to recommendations of creating an environment that allows for a cyclical adoption process. This could be done through a general feedback loop method in the form of a yearly survey about how agents' clients would like to receive their information. By

making this the normality for agents to continue to look for ways to interact and reach their clients, there could be more of a willingness to adopt other technologies.

Throughout the semi-structured interviews agents kept refereeing to generations and geographical locations in terms that lent to immense stereotyping. Agents kept referring to the older generations in a way that lent to the stereotype that all older individuals did not know how to utilize new media technologies and that all millennials were competent to fully understand how to utilize and operate new media technologies most efficiently. They also commonly made the assumption that urban areas included younger generations that were all on new media technologies and rural areas included more individuals in older generations who were not on new media technology platforms. This however is not the case. Assumptions and stereotypes can be very misleading and detrimental to education and further advancements in extensions. More relevant titles should be used to describe the client at hand. Rogers (2005) suggests using names such as innovators, early adopters, or laggards to identify where individuals stand in the speed at which they adopt a technology. Just because and individual is a part of an older generation does not mean they a late adopter or laggard and vice versa, just because someone is a millennial does not mean they are an innovator.

A final recommendation for practice is to consider the use of open and closed groups on new media technology platforms to enhance existing practices already put in place. Open groups could help further the growth and education of extension. Individuals could learn about the benefits of extension in a non-threating easily accessible manner amongst peers who have similar interest. Individuals could first learn about extension through an online group before having to personally attend a meeting or an individual could continue to gain information from that group without ever having to attend a meeting. While closed groups would not lend toward educating

the general public about topics covered in extension, they could potentially lead to more in-depth discussion from producers. Individuals who may not readily speak up in face-to-face meetings may feel more comfortable speaking up behind the security of a computer screen. Members could also continue conversations that were started at meetings and further the process of networking at a later date and time on these platforms. Agents could also gain insights as to what type of information individuals were asking for and a general census of what was going on in their community. Open and closed groups both serve a purpose and pose an opportunity for further discussions that could help move extension towards its main purpose.

Recommendations for Research

Future research can provide a deeper understanding of extension agents and their adoption practices when it comes to new media technology and can be utilized in the following.

1. The participants of the study were limited to just Kansas agricultural extension agents. Future research should be done on a bigger scale. Extension as a whole should be examined, disregarding the agent's position, and include more than just the state of Kansas, maybe include a regional study such as the Midwest or a national study.
2. This study was done looking at the agents' perspectives of roadblocks and reasonings for new media technology adoption. The leading factor that caused agents to adopt or reject a technology was whether or not their clients were utilizing the technology to receive information. Further research should be conducted looking at the clients side, to see if agents are reaching the clients in such a manner they are wanting to be reached.
3. During one of the interviews an agent who had previously been a teacher, brought up a point when talking about new media technology and the generational gap. He had noticed that younger generations who grew up using apps and new media technology had a

difficult time completing simple tasks on a computer such as renaming files, saving files and typing without pecking at the keyboard. The generation that had grown up with new media technology and utilizing apps essentially leapfrogged over these steps. The agent had assumed that younger generations would already know how to do this, but they did not, they had essentially become like the older generations who did not grow up with technology at all. A study looking at different generations and how they learn, and the effects of new media technology might explain how to better educate certain generations in the future.

4. One of the identified roadblocks from the study was the efficiency of communication when using new media technologies. This roadblock identified a break in a feedback loop. Agents were not able to gauge who was getting what information and this became very frustrating to them. Without the full cycle of communication, knowing who received what information and if they understood the information, agents were unsettled with that aspect of adopting new media technology. Future research should look into how agents can better complete the feedback loop and measure what clientele they are reaching via new media technology and at what level they understood the information.

Final Thoughts

Agriculture is an industry that is forever growing and changing, as well as the technologies the industry utilizes. The two have become extremely close and intertwined over the years. It seems the further individuals get removed from agriculture the more they want to know about where and how their food and textiles are being produced. This is where the role of communication in agriculture is coming to the forefront and communications technologies are

emerging. Agriculture extension is in a unique position as educators to utilize these technologies to educate both individuals associated and outside of agriculture.

It is imperative that extension agents stay relevant through the use of new media technology in order to reach new audiences of agriculturist and keep the dissemination of information flowing as new advances in agriculture come about. While some Kansas extension agents were using new media technology extensively, it was clear many agents were not adopting new media technology to its full potential. New media technology needs to become prominent in new agent training in order to become a required job duty for agents. Communication in agriculture is becoming the future of sustainable agriculture and in order for Kansas extension to reach their target audiences in an effective and affordable manner, new media technology must be accepted, adopted, and applied.

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Appendix A - Institutional Review of Board Approval

KANSAS STATE UNIVERSITY | University Research Compliance Office

TO: Dr. Jason Ellis
Communications and Agricultural Education
301C Umberger Hall

Proposal Number: 9390

FROM: Rick Scheidt, Chair
Committee on Research Involving Human Subjects

DATE: 08/02/2018

RE: Proposal Entitled, "Integrating New-Media Technology as an Educational Tool in Extension while Overcoming Associated Road-blocks"

The Committee on Research Involving Human Subjects / Institutional Review Board (IRB) for Kansas State University has reviewed the proposal identified above and has determined that it is EXEMPT from further IRB review. This exemption applies only to the proposal - as written – and currently on file with the IRB. Any change potentially affecting human subjects must be approved by the IRB prior to implementation and may disqualify the proposal from exemption.

Based upon information provided to the IRB, this activity is exempt under the criteria set forth in the Federal Policy for the Protection of Human Subjects, **45 CFR §46.101, paragraph b, category: 2, subsection: ii.**

Certain research is exempt from the requirements of HHS/OHRP regulations. A determination that research is exempt does not imply that investigators have no ethical responsibilities to subjects in such research; it means only that the regulatory requirements related to IRB review, informed consent, and assurance of compliance do not apply to the research.

Any unanticipated problems involving risk to subjects or to others must be reported immediately to the Chair of the Committee on Research Involving Human Subjects, the University Research Compliance Office, and if the subjects are KSU students, to the Director of the Student Health Center.

Appendix B - Initial Email Message to Invite Participants to Take the Survey

Initial Email Message to Invite Participants to Take the Survey

Dear Kansas Agricultural Extension Agent,

I am emailing to ask for your help in participating in a survey pertaining to your new media technology use as a Kansas agricultural extension agent.

For the purpose of this study new media technology is defined as technology encompassing a wide variety of web-related communication technologies, such as blogs, wikis, online social networking, virtual worlds and other social media forms (Friedman & Friedman, 2008).

The survey will be sent to you on August 20th and is a part of Kelsey Tully's graduate thesis work here at Kansas State University. The purpose of this survey is to identify agents to participate in semi-structured interviews covering their use of new media technologies more in-depth, to identify roadblocks to implementation, and to identify plausible solutions to overcoming the identified roadblocks. The results of this study will benefit you by furthering professional development and providing you, the agent, with better tools to implement new media technology in your professional lives.

The survey is short and should only take around **ten minutes to complete**.

I encourage you to partake in the survey.

Thank you,

Gregg Hadley

Appendix C - Survey Invitation

Invitation

Dear Kansas Agricultural Extension Agent,

As Gregg Hadley, had mentioned in a previous email sent out last week, I am emailing to ask for your help in participating in a survey pertaining to your new media technology use as a Kansas agricultural extension agent.

You are part of a census of all Kansas agricultural extension agents that has been chosen to complete a brief survey about your professional experience using new media technology as a Kansas agricultural extension agent. The goal of this survey is to identify agents to participate in semi-structured interviews covering their use of new media technologies more in-depth, to identify roadblocks to implementation, and to identify plausible solutions to overcoming the identified roadblocks.

For the purpose of this study new media technology is defined as technology encompassing a wide variety of web-related communication technologies, such as blogs, wikis, online social networking, virtual worlds and other social media forms (Friedman & Friedman, 2008).

The survey is short and should only take around **ten minutes to complete**. The survey will be open for two weeks and will close on September 3, 2018. To begin the survey, simply click on this link:

INSERT LINK

Your participation in this survey is entirely voluntary and all of your responses will be kept confidential. No personally identifiable information will be associated with your responses in any reports of the data. Completion of the survey indicates your willingness to be randomly selected for the semi-structured interviews. Should you have any further questions or comments, please feel free to contact the principal investigators, Dr. Jason Ellis in the Department of Communications and Agricultural Education at Kansas State University (jdellis@ksu.edu), or Kelsey Tully in the Department of Communications and Agricultural Education at Kansas State University (kmtully@ksu.edu).

Many thanks for your participation.

Jason Ellis, Ph.D.
Professor & Department Head
Department of Communications and Agricultural Education
Kansas State University

Kelsey Tully
Graduate Student
Department of Communications and Agricultural Education
Kansas State University

Appendix D - Email Reminders for Survey

First Reminder

Dear Kansas Agricultural Extension Agent,

Earlier this week we sent an e-mail to you asking for your participation in the survey pertaining to your new media technology use as a Kansas agricultural extension agent.

We hope that providing you with a link to the survey website makes it easy for you to respond. To complete the survey, simply click on this link:

INSERT LINK

We hope the data collected from this survey will help benefit Kansas agricultural extension in the future by providing a better understanding of agents' new media technology use, how to better implement new media technology in extension, and the benefits that will follow.

Your response is voluntary, and we appreciate your considering our request.

Sincerely,

Jason Ellis, Ph.D.
Professor & Department Head
Department of Communications and Agricultural Education
Kansas State University

Kelsey Tully
Graduate Student
Department of Communications and Agricultural Education
Kansas State University

Final Reminder

Dear Kansas Agricultural Extension Agent,

We recently sent you an email asking you to participate to a brief survey about Kansas agricultural extension agents' use of new media technology. This assessment of Kansas agricultural extension agents' use of new media technology is coming to a close on September 3, 2018. This is the last reminder we are sending about the study.

The link for the survey is included below to provide easy access to the survey. The survey will take you no longer than **ten minutes to complete**.

Survey link:

Thanks for your participation in the study if you would like more information about the study and the results please contact Kelsey Tully at kmtully@ksu.edu or the results will be posted on KREX in mid-May.

Sincerely,

Jason Ellis, Ph.D.
Professor & Department Head
Department of Communications and Agricultural Education
Kansas State University

Kelsey Tully
Graduate Student
Department of Communications and Agricultural Education
Kansas State University

Appendix E - Survey Instrument

Intro

You are invited to participate in a research study about Kansas Agricultural Extension agents' use of new media technology. You are being asked to participate in this survey because you are listed as a Kansas agricultural extension agent.

The purpose of the research is to better understand how Kansas Agricultural Extension agents are utilizing new media technologies and identify what roadblocks exist, as well as what solutions have been found to implement new media technology better into Kansas Agricultural Extension.

This survey is meant to help identify participants for the semi-structured interviews that will be conducted later on.

Completion of the survey indicates your willingness to be randomly selected for the semi-structured interviews.

This research is not affiliated with The Center for Rural Enterprise Engagement.

Consent Form

Research Participant Information and Consent
Integrating New-Media Technology as an Educational Tool in Extension while Overcoming Associated Road-blocks

Principal Investigator: Jason Ellis (email: jdellis@ksu.edu)
Researcher: Kelsey Tully (email: kmtully@ksu.edu)

What Will My Participation Involve?

If you decide to participate in this research, you will be asked to complete an online questionnaire. Your participation will last approximately 10 minutes. Completion of the survey indicates your willingness to be randomly selected for the semi-structured interviews.

Are There Any Risks to Me?

We do not anticipate any risks.

Are There Any Benefits to Me?

A knowledge of new media technology and awareness of the benefits of using new media technology in Extension could help to better disseminate information and keep Extension relevant.

How Will My Confidentiality be Protected?

While there will be publications as a result of this study, your name will not be used. We will not directly quote any comments you make in the survey.

Whom Should I Contact If I Have Questions?

You may ask any questions about the research at any time. If you have questions about the research after you finish today you should contact the Principal Investigator, Jason Ellis, at jdellis@ksu.edu or the researcher, Kelsey Tully, at kmtully@ksu.edu.

If you are not satisfied with the response of the research team, have more questions, or want to talk with someone about your rights as a research participant, you should contact Rick Scheidt, Committee Chair at Kansas State University, at (785) 532-1483 or rscheidt@ksu.edu.

Your participation is completely voluntary. You have the right to withdraw from the study at any time.

Checking the box below indicates that you have read this consent form, had an opportunity to ask any questions about your participation in this research, and voluntarily consented to participate.

This research is not affiliated with The Center for Rural Enterprise Engagement.

- ○ I agree to participate in this study and have read the consent form above.
- ○ I do not want to participate in this study

Educational Background

What is the highest level of education you have completed?

- ○ 4 year degree
- ○ Master's
- ○ Professional degree
- ○ Doctorate degree

What is your educational background by degree or major for your highest degree completed? (Select all that apply)

- ☐ Agribusiness
- ☐ Agricultural Communications and Journalism
- ☐ Agricultural Economics
- ☐ Agricultural Education
- ☐ Agriculture Technology Management
- ☐ Agronomy
- ☐ Animal Sciences and Industry
- ☐ Bakery Science and Management
- ☐ Food Science and Management
- ☐ Food Science and Industry
- ☐ General Agriculture
- ☐ Horticulture
- ☐ Milling Science and Management
- ☐ Park Management and Conservation
- ☐ _____ Other

In what focus area of Agricultural Extension do you primarily work? (Job Title/Expertise)

- ○ Crops
- ○ Livestock
- ○ Horticulture

- ○ General Agriculture
- ○ _____ Other

How many years have you worked in **Extension total**?

▼

In total, how many years have you worked in **Agricultural Extension**?

▼

New Media Definition

For the purpose of this study, new media technology is defined as an all-inclusive communication technology.

New media technology encompasses a wide variety of web-related communication technologies, such as blogs, wikis, online social networking, virtual worlds and other social media forms (Friedman & Friedman, 2008)

New Media for Work

Do you use new media technology for professional or work-related purposes?

- ○ Yes
- ○ No

New Media Questions

Please indicate to what extent you agree or disagree with each statement.

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
I consider myself to be "tech-savvy".	O	O	O	O	O	O	O
The use of new media technology in extension would benefit agents.	O	O	O	O	O	O	O
New media technology is hard to learn.	O	O	O	O	O	O	O

Please indicate to what extent you agree or disagree with each statement.

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
New media technology will only make my job harder.	O	O	O	O	O	O	O
The use of new media technology in Extension would benefit clients.	O	O	O	O	O	O	O
New media technology is too hard to use.	O	O	O	O	O	O	O

New Media Technology Use

In the next series of questions, you will be asked about technology and social-media use.

On the Internet, approximately how often do you...

	Never	Once a Year or Less	Several Times a Year	Once a Month	2-3 Times a Month	Once a Week	2-3 Times a Week	Daily
Comment on webpages (i.e., news story)	O	O	O	O	O	O	O	O
Comment on blogs	O	O	O	O	O	O	O	O

	Never	Once a Year or Less	Several Times a Year	Once a Month	2-3 Times a Month	Once a Week	2-3 Times a Week	Daily
Comment on tweets	O	O	O	O	O	O	O	O
Comment on Facebook posts	O	O	O	O	O	O	O	O
Post ratings/reviews on products or services	O	O	O	O	O	O	O	O
Reply to a discussion thread on a forum	O	O	O	O	O	O	O	O
"Like" a post on Facebook	O	O	O	O	O	O	O	O

On the Internet, approximately how often do you...

	Never	Once a Year or Less	Several Times a Year	Once a Month	2-3 Times a Month	Once a Week	2-3 Times a Week	Daily
Tag webpages for yourself or others using social bookmarking (i.e., Digg, StumbleUpon)	O	O	O	O	O	O	O	O
Subscribe to a website or blog using RSS	O	O	O	O	O	O	O	O
Subscribe to a podcast	O	O	O	O	O	O	O	O
Subscribe to a video website channel (i.e., YouTube Channel)	O	O	O	O	O	O	O	O
Subscribe to an online forum	O	O	O	O	O	O	O	O

On the Internet, approximately how often do you...

	Never	Once a Year or Less	Several Times a Year	Once a Month	2-3 Times a Month	Once a Week	2-3 Times a Week	Daily
Publish or update your own Web page/site	O	O	O	O	O	O	O	O
Write a blog	O	O	O	O	O	O	O	O

	Never	Once a Year or Less	Several Times a Year	Once a Month	2-3 Times a Month	Once a Week	2-3 Times a Week	Daily
Upload videos to the web for the purpose of sharing	O	O	O	O	O	O	O	O
Post original content to Facebook	O	O	O	O	O	O	O	O
Post original content to Twitter	O	O	O	O	O	O	O	O
Post original content to another social-media site besides Facebook or Twitter	O	O	O	O	O	O	O	O
Initiate a discussion on a forum	O	O	O	O	O	O	O	O
Upload photos to the web for the purpose of sharing (using Facebook, Twitter, Flickr, etc.)	O	O	O	O	O	O	O	O
Post original content to a wiki (Wikipedia, pbworks, etc.)	O	O	O	O	O	O	O	O

On the Internet, approximately how often do you...

	Never	Once a Year or Less	Several Times a Year	Once a Month	2-3 Times a Month	Once a Week	2-3 Times a Week	Daily
Read/look at posts on Facebook	O	O	O	O	O	O	O	O
Read/look at posts on Twitter	O	O	O	O	O	O	O	O
Read a blog	O	O	O	O	O	O	O	O
View user-generated videos online	O	O	O	O	O	O	O	O
Listen to podcasts	O	O	O	O	O	O	O	O
Search for and read reviews	O	O	O	O	O	O	O	O
Search for and read online forums	O	O	O	O	O	O	O	O

	Never	Once a Year or Less	Several Times a Year	Once a Month	2-3 Times a Month	Once a Week	2-3 Times a Week	Daily
Search for and read articles found in an internet search	○	○	○	○	○	○	○	○

Which of the following social-media sites have you joined and created an account?

	Yes	No
Google + (Plus)	○	○
Twitter	○	○
Facebook	○	○
YouTube	○	○
Blogging Website (i.e., Wordpress, Blogger)	○	○
Social Bookmarking (i.e., Digg, StumbleUpon, Delicious)	○	○
Social media management tool (i.e., HootSuite, Tweetdeck, etc.)	○	○
Other(s)	○	○

Appendix F - Interview Protocol and Questions

Semi-structured Interview Questions

Introduction

My name is Kelsey Tully and I am currently a graduate student in the department of communications and agricultural education at Kansas State University. The research you are participating in today is looking at your new media technology use and identifying roadblocks and solutions to better implementing them in extension to help reach more clients in a timely manner and bridge the generation gap. Both audio and video will be recorded but kept confidential. Just a reminder, for the purpose of this study new media technology is defined as an all-inclusive communication technology; new media technology encompasses a wide variety of web-related communication technologies, such as blogs, wikis, online social networking, virtual worlds and other social media forms (Friedman & Friedman, 2008). Thank you again for participation in this study.

Questions

1. Are you still willing to participate in this study?
2. Can you please state your name?
3. What is your job title?
4. How do you perceive new media technology? (good, bad, both)
5. How do you make decisions on what technology to implement?
6. What changes have you made to your program based on social media?
    a. Where the changes positive or negative
7. How has technology affected your relationship with clients
8. What drives you to implement your new media technology changes?
    a. Personal, Clients are on it, industry driven
9. How do you make decisions on what technology to implement?
10. What do you perceive as roadblocks preventing you from implementing new media technology?
    a. How would you asses overcoming said roadblocks?
11. How have you overcome difficulties utilizing certain new media technologies in the past?

12. Do you use new media technology in your personal life?
    a. What challenges do you see imposing it into your professional life?
13. What new media technologies do you use most often?
    a. Why do you choose to use these most?
    b. What do you like about them?
    c. What do you dislike about them?
14. What, if any, new media technologies do you find unbeneficial?
15. What professional training on new media technology have you completed?
16. Why have you been reluctant to adopt new media technologies?
17. What circumstances would have to take place before you adopted new media technology?
18. What would be your reaction to not being able to implement a technology after attempting a couple of times?
19. How do you feel when you cannot get a technology to work in the manner in which it was intended for?
20. If you discovered a new technology and thought it might be beneficial, what would you do?

Debriefing Statement

I want to thank you for your time, as a reminder all of your responses will be kept confidential and any personally identifiable information will be changed in the writeups. If you have any questions about the project later on you can contact Dr. Jason Ellis at jdellis@ksu.edu or myself at kmtully@ksu.edu, we will be more than happy to answer any questions and if you're not satisfied with the response of the research team or you have more questions you can contact Rick Scheidt, the Committee Chair for Kansas State University, and his email address is rscheidt@ksu.edu. Thanks again for your participation.

Appendix G - Coding Tool

Coding Tool

1. Relative Advantage
2. Compatibility
3. Complexity
4. Trialability
5. Observability
6. Governing Variables (why we do what we do)
7. Action strategies and Techniques (what we do)
8. Results and Consequences (what we obtain/ results)
9. Lean
10. Focus
11. Align
12. Execute
13. Single loop
14. Double loop