A Descriptive Study of Internet-enhanced Instruction in Georgia Secondary Agricultural Education

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Walter John Parks

MS, The University of Georgia, 2000
BSA, The University of Georgia, 1997

This dissertation, "A Descriptive Study of Internet-enhanced Instruction in Georgia Secondary Agricultural Education," by Walter John Parks, is approved by:

Dissertation Committee Chair

Reynaldo L. Martinez, Jr., Ph.D.
Professor of Adult and Career Education

Committee Members

Lars Leader, Ph.D.
Associate Professor of Curriculum, Leadership, and Technology

Charles Backes, Ph.D.
Professor of Adult and Career Education

Sean Lennon, Ed.D.
Associate Professor of Middle Grades, Secondary, Reading and Deaf Education

Dean of the Graduate School

James T. LaPlant, Ph.D.
Professor of Political Science

Defense Date

April 4, 2018

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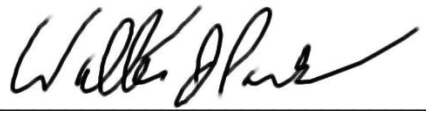
Signature 

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ABSTRACT

The purpose of this study was to describe the extent and type of the use of Internet-enhanced instruction by secondary Agricultural Education teachers in Georgia, to determine perceived barriers and enabling factors for the implementation of such instruction and provide insight into the kinds of professional development Agricultural Education teachers need. Demographic information on each program was used to determine if differences existed in relation to Internet usage. Data were collected using a survey instrument for the quantitative portion and semi-structured interviews for the qualitative portion.

Descriptive statistics were used to analyze responses to the survey instrument and frequencies and percentages were reported. Multivariate Analysis of Variance tests were used to determine if significant differences on the perceptions of respondents towards using the Internet to enhance learning in the classroom could be attributed to ratings on the survey in relation to the demographic variables of age, years of teaching experience, number of hours using the Internet per week, and the number of Internet-connected devices in the respondents' rooms. Open-ended questions were utilized during the interview process to identify perceived barriers and enablers and elicit recommendations for professional development.

The findings revealed that 98% of participants used the Internet to some degree to enhance learning in their classrooms. There was a significant effect on survey ratings for the variables of age, total years teaching, and the number of Internet-connected devices. Teachers selected for interviews shared many recommendations for professional development, the most prominent of which was to focus on one Internet use at a time.

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ACKNOWLEDGMENTS

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DEDICATION

I humbly dedicate this dissertation to my loving wife Sheryl and our three wonderful children, Elizabeth, Ethan and Elijah. Thank you so much for your support, patience, love and for believing in me. I love you all so much.

Chapter I

INTRODUCTION

Every individual has unique strengths, weaknesses and learning styles. However, the industrial-age model of education, begun in the nineteenth century, made little concession for individual learning styles. Instead, the goal of education was to "turn out factory workers who were docile, easily administered, and not prone to participate in strikes and working-class violence" (Kincheloe, 1999, p. 98). In modern times, this model inappropriately emphasized the ubiquitous mastery of static knowledge rather than met the rapidly moving, twenty-first century model where the ability to discover new things was more important than rote memorization (Tapscott, 2009). Furthermore, providing individualized learning opportunities for diverse learners such as students with learning disabilities or speakers of other languages were often not included in this one-size-fits-all approach (Dolan, Hall, Banerjee, Chun, & Strangman, 2005).

A parable written by George Reavis (1999) provided an excellent illustration of this outdated, ineffective model:

> Once upon a time the animals decided they must do something heroic to meet the problems of a "new world" so they organized a school. They had adopted an activity curriculum consisting of running, climbing, swimming and flying. To make it easier to administer the curriculum, all the animals took all the subjects. The duck was excellent in swimming.

In fact, better than his instructor. But he made only passing grades in flying and was very poor in running. Since he was slow in running, he had to stay after school and also drop swimming in order to practice running. This was kept up until his webbed feet were badly worn and he was only average in swimming. But average was acceptable in school so nobody worried about that, except the duck. The rabbit started at the top of the class in running but had a nervous breakdown because of so much makeup work in swimming. The squirrel was excellent in climbing until he developed frustration in the flying class where his teacher made him start from the ground up instead of the treetop down. He also developed a "charlie horse" from overexertion and then got a C in climbing and D in running. The eagle was a problem child and was disciplined severely. In the climbing class, he beat all the others to the top of the tree but insisted on using his own way to get there. At the end of the year, an abnormal eel that could swim exceeding well and also run, climb and fly a little had the highest average and was valedictorian. The prairie dogs stayed out of school and fought the tax levy because the administration would not add digging and burrowing to the curriculum. They apprenticed their children to a badger and later joined the groundhogs and gophers to start a successful private school. Does this fable have a moral?

Using the Internet to Enhance Learning

Providing learning opportunities that maximize an individual's strengths while making concessions for and strengthening their weaknesses has often been one of the

most difficult tasks in education. To solve this dilemma, teachers have long used technology to enhance learning for students. Technology, including Internet technologies, has advanced at an extremely rapid pace (Schwab, 2016). Betcher and Lee (2009) stated that one of the first revolutionary technologies used in modern education was the blackboard. For the nineteenth and twentieth centuries "The blackboard became synonymous with the traditional classroom and, along with shiny red apples, is still seen as a stereotypical symbol of education" (p. 1). In the twenty-first century this technology gave way to Interactive White Boards (IWB), computers and the Internet. Betcher and Lee (2009) stated that many teachers have taken existing paper-based tasks and simply transferred them to the same tasks on IWB's. Although this was the expected behavior as new technology was adopted, this approach should be avoided as it is an "old wine in new bottles" approach (Betcher and Lee, 2009, p. 1). Although attempts have been repeatedly made to utilize computers in the classroom, results have been mixed (Lowe, 2002) and there was a great deal of controversy on the impact computers have when used in education (Cuban, 2003; Oppenheimer, 2004; Tyack & Cuban, 2000).

Despite the controversy surrounding the effectiveness of computers in education, one particular educational technology, the Internet, may turn out to be the most effective as it has already had a dramatic impact on the world and on education (Martin, 2004). The Internet can be accessed by not only computers, but also tablet computers, mobile phones and other mobile devices. Today's student grew up in the "Digital Age" with abilities and attitudes very different from his predecessors (Tapscott, 2009). When confronted with a problem, a modern student, or "digital native" turned first to the Internet for solutions while a "digital immigrant" (teacher) often turned to the Internet

secondarily after utilizing other resources (Prensky, 2001, p. 2). The modern student is also very comfortable interacting online with his peers where he works collaboratively and thrives on that interactivity, yet is physically alone in his room during the interaction (Black, 2010). Furthermore, there is an expectation of immediate feedback from his instructors (Betts & Glogoff, 2004). In order to engage these types of learners effectively, educators use some of the same technological tools inside the classroom that students use outside of the classroom to create an Internet-enhanced learning environment. Prensky (2006) supported this practice by stating that educating or evaluating students without using the educational tool of technology "makes no more sense to them than educating or evaluating a plumber without his or her wrench" (p. 10). According to the National Center for Educational Statistics (2016a), 74.6% of the U.S. population over age 3 used the Internet. Therefore, because American students, along with the rest of the population, use the Internet in their daily lives to "complete schoolwork, locate jobs, watch movies, access healthcare information, and find relationships" (File and Ryan, 2014) incorporating the Internet into the classroom just makes sense (Inoue, 2010). Digital Natives (Prensky, 2001) who found traditional classrooms boring (Brydolf, 2007) could be engaged by using the Internet in the classroom (Berk, 2010). Additionally, Kerry and Isakson (2000) stated that the technology used for Web-based education could help teachers achieve the "age-old goals in education – To center learning around the student instead of the classroom, To focus on the strengths and needs of individual learners," and "To make lifelong learning a reality" (p. 2).

However, despite the fact that research suggests that students need the Internet to be incorporated into the classroom in order to enhance learning, the teacher himself is the most critical factor that determines if any technology is used in his classroom (Groff and Mouza, 2008). Not only the teacher's beliefs about, attitudes towards, and training in the use of technology but also his access to technological resources, and demographic characteristics all affect technology adoption (Ertmer, 1999; 2005; Franklin, 2007; Wang, 2017). Furthermore, teachers often feel apprehensive about using technology in the classroom because this often challenges their current role (Groff & Mouza, 2008; McKenzie, 2004; Zhao & Frank, 2003). A teacher may also find himself taking on the role of "student," because many of his students end up teaching the teacher how to use the technology, which may be an uncomfortable role for the teacher (Bowman, 2004; Groff & Mouza, 2008).

Historically, there was a tremendous amount of research that focused on using technology, such as computers, in education to enhance instruction. Yet, some recent research has shifted to focus specifically on the use of the Internet in education. However, the body of research that has been done regarding the effectiveness of using Internet-based technology to create Internet-enhanced classrooms in education has predominantly focused on post-secondary education instead of secondary education (Brodersen & Melluso, 2017; Lindner, Hynes, Murphy, Dooley, & Buford, 2003; Mentzer, Cryan, & Teclehaimanot, 2007; Murphrey & Boyd, 2002). In fact, Means, Toyama, Murphy, Bakia, & Jones (2010) found that only 9 out of 176 studies of online learning published between 1996 and 2008 involved K-12 learners. Furthermore, the majority of the studies in secondary education focused on the effectiveness of Internet-

enhanced academic courses such as English, Mathematics and Science rather than on Career and Technical Education (CTE) courses. 99% of all secondary schools have access to the Internet (National Center for Educational Statistics, 2016b), and although 55% of secondary students took online courses, 27% of all students enrolled in distance-courses in U.S. public schools were taking career and technical education courses (Queen and Lewis, 2011). So, although over one quarter of high school students took online courses in the career and technical education disciplines, just a few studies (Layfield, Radhakrishna, & Scanlon, 2000; Peckham and Iverson, 2000; Swortzel, et al., 2004; Williams, et al., 2014) have focused on using the Internet specifically in Agricultural Education.

Statement of the Problem

The need for this study arises from the rapid advances in Internet technology made every year combined with the increasing availability of the Internet to students. Therefore, it is important to continually investigate how secondary Agricultural Education teachers use and view Internet-enhanced teaching in order to effectively utilize this educational tool. The problem is that current research falls short of describing Internet use by secondary Agricultural Education teachers in Georgia and the barriers present that would hinder them from effectively enhancing their classrooms using the Internet.

Purpose of the Study

The primary purpose of this study is to describe the extent and type of the use of Internet-enhanced instruction by secondary Agricultural Education teachers in Georgia. This study will also describe the perceived factors that either encourage or discourage the

implementation of such instruction in secondary Agricultural Education classes in Georgia. Finally, this study will provide insight into the kinds of professional development Agricultural Education teachers need in order to integrate the Internet into their instruction.

Research Questions

The following research questions will be used to guide this study:

1. What is the reported extent of the use of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participate in the study?
2. What are the current uses of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participate in the study?
3. What are the demographic and perceived intrinsic and extrinsic factors and variables that encourage the use of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participate in the study?
4. What are the demographic and perceived inhibiting factors and variables that discourage the use of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participate in the study?
5. What professional development opportunities for using Internet-enhanced instructional strategies are needed by Georgia secondary Agricultural Education teachers who participate in the study?

Theoretical Framework

The Diffusion of Innovations theoretical framework will help to understand and interpret the results of this research into the adoption of the Internet to enhance secondary

Agricultural Education classrooms in Georgia. The theory of Diffusion of Innovations was popularized by Everett Rogers in his book "Diffusion of Innovations" (1962) and was later explored in subsequent editions (2nd ed.-1971, 3rd ed.-1983, 4th ed.-1995 and 5th ed.-2003). This theory states that "Diffusion is the process by which an innovation is communicated" and adopted "through certain channels over time among the members of a social system" (Rogers, 2003, p. 5). The diffusion of innovation often takes a great deal of time to become widely adopted even if the innovation itself appears to have a great advantage over a previous process. Rogers (2003) stated that "The Internet has spread more rapidly than any other technological innovation in the history of mankind" (p. xix). The Internet is used to such a great extent by individuals that its diffusion into classrooms is inevitable. It is not a panacea for all educational problems but the Internet is a tool that can help "empower every student and elevate each individual to new levels of intellectual capacity and skill" (Kerrey and Isakson, 2000, p. 7). In fact, Rogers (2003) states that "such interactive communication technologies" as the Internet may be changing the diffusion process by removing the "spatial distance in who talks to whom about a new idea" (p. xix).

The four main elements in the diffusion of innovations theory are 1) the innovation itself, 2) the communication of that innovation, 3) the time it takes for diffusion and 4) the social systems through which the innovations diffuse. "An innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption" (Rogers, 2003, p. 12). The diffusion process usually follows an S-shaped curve with the first part of the curve made of a few individual "innovators," adopting the innovation, a slightly larger portion, "early adopters," then the two largest

parts of the curve made up of the "early majority" and the "late majority" and finally the tail of the curve made up of the "laggards" (Rogers, 2003, p. 22). The final element in the diffusion of innovations is the social system through which diffusion occurs. Social systems are defined as sets of "interrelated units that are engaged in joint problem solving to accomplish a common goal" (Rogers, 2003, p. 27). In his theory, Rogers posited that there were five stages through which an individual progressed in adopting an innovation. These were: knowledge, persuasion, decision, implementation, and confirmation (Rogers, 2003, p. 165). The Diffusion of Innovations theory is an appropriate lens to use when studying the adoption of technology in education (Parisot, 1995, Medlin, 2001).

Limitations

This will be a statewide study to identify and describe those programs that use the Internet to enhance education in Secondary and Middle School Agricultural Education classes in Georgia. Certain inherent limitations of the research should be considered in the application of the results as follows:

1. The data collected in this study will be limited to the secondary Agricultural Education teachers (approximately 466) in the state of Georgia in the year 2017.
2. The results of this study will be limited by the ability, accuracy, honesty, and objectivity of the respondents.
3. Another limitation is that the descriptions of factors are the perceptions of the participants of the study. These perceptions can be biased; therefore, the results will have limited generalizability.
4. Another limitation is that the respondents may not be completely representative of all Agricultural Education teachers in Georgia [approximately 466 (Georgia

Agricultural Education, 2017)] or representative of the total number [approximately 11,000 (Thompson, 2017)] of Agricultural Education teachers in the United States.

Assumptions

Two assumptions will be made regarding the survey instrument used in the study. The first assumption is that Georgia Agricultural Education teachers should be integrating the Internet to enhance classroom learning. The second assumption is that the participants will complete the survey honestly and to the best of his or her knowledge and ability.

Significance of the Study

This study will provide new insight into the extent to which and how Georgia Agricultural Education teachers are using technology to create Internet-enhanced instruction as well as identifying factors that may encourage or discourage the implementation of such teaching strategies to enhance learning for students. It is hoped this study will provide data for Agricultural Education teachers to determine successful practices and how to implement these teaching strategies. This information could then be used to suggest ways to ameliorate the perceived inhibitions and improve learning in all Agricultural Education classrooms in the United States. Additionally, this study can provide insight into areas of professional development that would be useful for administrators and state program leaders with regards to the further implementation and use of Internet-enhanced instructional strategies.

Definition of Key Terms

Several key terms are used repeatedly throughout the study. These terms are defined as follows:

- *Agricultural Education*. Systematic instruction in agriculture at the secondary level for the purpose of preparing students for leadership and career roles in agriculture and related fields (Phipps & Osborn, 1988).
- *Blog*. Web logs or online journals or that allow others to make comments on what the author has written (Imperatore, 2009b).
- *Career Development Events (CDE)*. CDEs are contests that National FFA members compete in to test the knowledge and skills they have learned through Agricultural Education instruction (National FFA Organization, 2017).
- *Career and Technical Education*. "Perkins IV defines career and technical education as organized educational activities that offer a sequence of courses that provides individuals with the academic and technical knowledge and skills the individuals need to prepare for further education and for careers in current or emerging employment sectors. Career and technical education includes competency-based applied learning that contributes to student's academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills" (U.S. Department of Education, 2006).
- *Career Technical and Agricultural Education (CTAE)*. Part of the state career and technical education system in Georgia that seeks to promote student success by providing classes, hands-on labs, Career Technical Student Organizations

(CTSOs) and on-the-job experiences (Woods, 2015).

- *Digital Natives*. Modern students who are "Native speakers of technology, fluent in the digital language of computers, video games, and the Internet" (Prensky, 2006, p. 8).
- *Digital Immigrants*. Individuals not born into the digital world who "have adopted many aspects of the technology …", but like those who have learned another language later in life, "retain an "accent" because we still have one foot in the past" (Prensky, 2006, p. 8).
- *Internet-enhanced (termed "Web-enhanced") course instruction*. "A broad category of courses with associated web sites or course management system classrooms that contain materials relevant to the course (perhaps a syllabus, a list of web-based resources, a course calendar, a reading list, lecture notes or video lectures, discussion board, and/or real-time online meeting functions and chat)." (Ko and Rosen, 2010, p. 359).
- *Learning management system (LMS)*: A software application used to organize and distribute e-learning materials, assignments, and assessments; track and calculate grades; and facilitate communication among students and teachers (Dictionary.com, nd).
- *Professional Learning Unit (PLU)*. "Professional Learning is the means by which teachers, administrators, and other staff acquire, enhance, and refine the knowledge, skills, practices, and dispositions necessary to create and support high levels of learning for all students" (Jones, 2017). These units are required for teacher recertification in Georgia.

- *Secondary Education.* For the purpose of this study it will include agricultural programs that exist between 6th and 12th grade. "A school intermediate between elementary school and college and usually offering general, technical, vocational, or college-preparatory courses" (Merriam-Webster's, 2003).
- *Web 2.0.* The way software developers and end users use the Internet. Web 1.0 was a read-only medium which provided one-way, static information, while Web 2.0 is a read/write medium that gives users the ability to discover, create, and organize information and to connect with others interested in the same topics (Thompson, 2007; Imperatore, 2009a; O'Reilly, 2005).
- *Wiki.* A "freely expandable collection of interlinked web pages, a hypertext system for storing and modifying information – a database, where each page is easily edited by any user with a forms-capable Web browser client" (Leuf & Cunningham, 2001, p. 14).

Chapter II

LITERATURE REVIEW

Introduction

This chapter provides a review of research that has been done in the areas associated with the major topics discussed in this study: the theoretical framework for this study, the history of technology integration into the classroom, Internet-enhanced instruction at the Post-secondary level, Internet-enhanced instruction at the middle school and the secondary level in academic disciplines, Internet-enhanced instruction at the middle school and the secondary level in CTAE, and barriers to technology integration.

A computerized search of several databases was made including *Educational Resources Information Center* (ERIC), *Galileo* and the *Valdosta State University Odum Library A to Z* database. In addition, several searches were conducted utilizing common Internet search engines such as Google and Bing. Additionally, web sites with indexes of journals such as *Techniques, Journal of Agricultural Education, Career and Technical Education Research* and the *Journal of Career and Technical Education* were used. A manual search was also made of several educational journals as well as books related to Internet-enhanced instruction. Most searches focused on information published from 2000 forward, although some older material was utilized for historical background.

Theoretical Framework

This research study will be guided by the theory of Diffusion of Innovations popularized by Everett Rogers in his book "Diffusion of Innovations" (1962) and was later explored in subsequent editions (2nd ed.-1971, 3rd ed.-1983, 4th ed.-1995 and 5th ed.-2003). This theory states that "Diffusion is the process by which an innovation is communicated" and adopted "through certain channels over time among the members of a social system" (Rogers, 2003, p. 5). To get a new innovation adopted, "even when it has obvious advantages, is difficult" (Rogers, 2003, p. 1). Thus, innovations take a great deal of time to become widely adopted and "a common problem for many individuals and organizations is how to speed up the rate of diffusion of an innovation" (Rogers, 2003, p. 1).

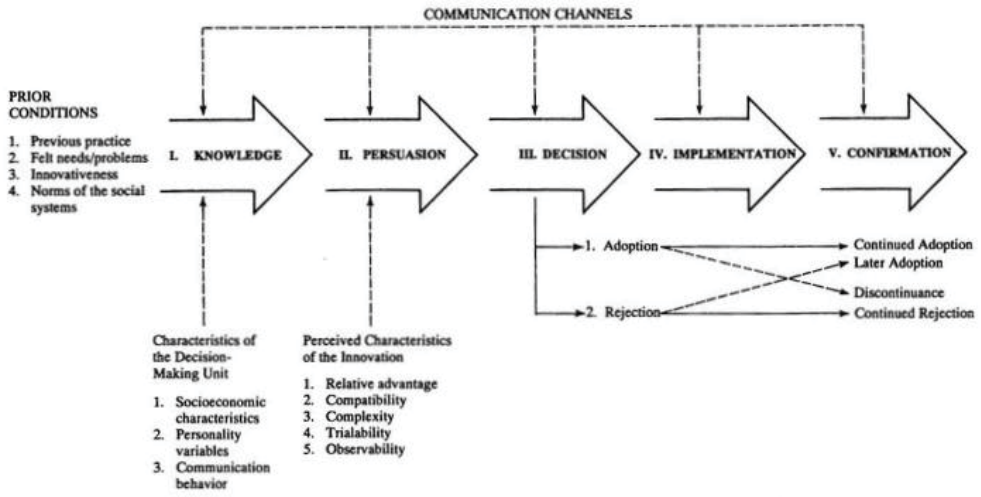
Rogers first studied how farmers in Iowa often delayed adopting new agricultural practices for many years despite the fact that these new practices could prove more profitable than current practices. After reviewing the literature for his dissertation and subsequent research, Rogers found that diffusion of innovations was a "general process" or "universal process of social change" regardless of the type of innovation (agricultural, educational, medical, consumer products, etc.) (Rogers, 2003, p. xvi).

The four main elements in the diffusion of innovations theory were 1) the innovation itself, 2) the communication of that innovation, 3) the time it takes for diffusion and 4) the social systems through which the innovations diffuse. "An innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption" (Rogers, 2003, p. 12). The innovation may have existed for a great deal of time, but it was perceived as new to the individual because either he has just learned of

it or has recently developed a favorable attitude toward it. "Communication is a process in which participants create and share information with one another in order to reach a mutual understanding" (Rogers, 2003, p. 5). Communication can occur through mass media or interpersonal channels. However, most often the diffusion of innovation flows in a two-step process from mass media to opinion leaders and then from these leaders to individual adopters (Rogers, 2003). Rogers cited Lazarsfeld and Menzel (1963) in stating that people are much more influenced by face-to-face contact than by the mass media (Rogers, 2003, p. 304). The time it takes for an innovation to diffuse can be relatively rapid or very slow. According to the United Nations (nd) it took 38 years for radio broadcasters to reach fifty million users while it took the Internet only 4 years to reach that level of saturation. The diffusion process usually follows an S-shaped curve with the first part of the curve made of a few individuals "innovators," adopting the innovation, a slightly larger portion, "early adopters," then the two largest parts of the curve made up of the "early majority" and the "late majority" and finally the tail of the curve made up of the "laggards" (Rogers, 2003, p. 22). The final element in the diffusion of innovations is the social system through which diffusion occurs. Social systems are defined as sets of "interrelated units that are engaged in joint problem solving to accomplish a common goal" (Rogers, 2003, p. 27). The system had both a direct and indirect influence on diffusion and "affects the innovation's diffusion in several ways" (Rogers, 2003, p. 27).

In his theory, Rogers posited that there were five stages through which an individual progressed in adopting an innovation (Figure 1). These were knowledge, persuasion, decision, implementation, and confirmation (Rogers, 2003, p. 165).

Figure 5-1. A Model of Five Stages in the Innovation-Decision Process



The *innovation-decision process* is the process through which an individual (or other decision-making unit) passes from first knowledge of an innovation, to forming an attitude toward the innovation, to a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision.

Figure 1: Five stages of the innovation-decision process.

Rogers (2003) divided the adopters of the innovation into 5 distinct categories: innovators, early adopters, early majority, late majority, and laggards. Innovators and laggards were the two tails of the adoption curve while the early majority were the largest group of adopters in the middle. The adopters between the innovators and the early majority were called the early adopters while those between laggards and early majority were called the late majority (Figure 2).

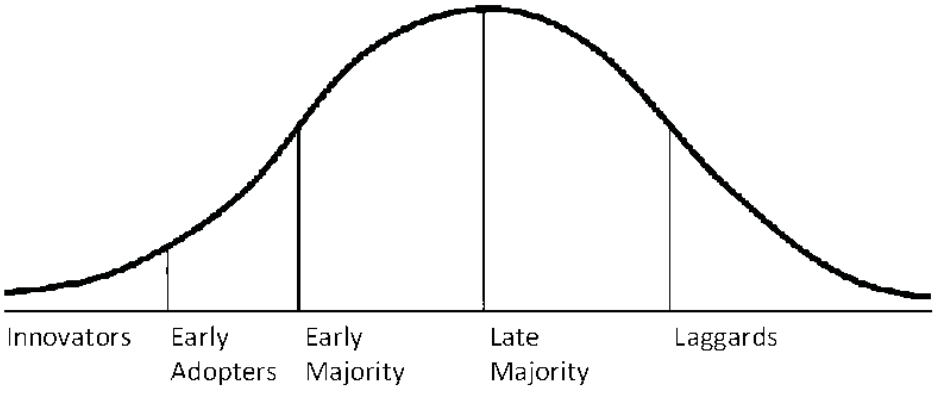


Figure 2: Five distinct categories of adopters.

In this model an individual is exposed to the innovation and attempts to gain an understanding of how the innovation functions. Subsequently, the individual develops either a favorable or unfavorable attitude towards the innovation. Then the individual decides to adopt or reject the innovation. If the individual accepts the innovation, he implements the new idea. Finally, the individual seeks reinforcement for his implementation of the innovation and decides to confirm or reverse the innovation (Rogers, 2003).

Most scholars agreed that the diffusion of innovations was fundamentally a communication process. However, research on diffusion of innovations differed from research into other areas of communication, such as the diffusion of news, in that it centered not only on becoming aware of some new knowledge, "but also on attitude change, decision-making, and implementation of the innovation" (Stacks & Salwen, 2009, p. 419).

The Diffusion of Innovations theory is an appropriate lens to use when studying the adoption of technology in education (Parisot, 1995, Medlin, 2001). This framework was especially appropriate for this study due to the fact that this study focuses on innovations in Agricultural Education and the original work Everett Rogers used to form his theory of the Diffusion of Innovations was based around farmers' adoption of new agricultural practices (Rogers, 2003). Numerous studies have used the Diffusion of Innovations model in describing technology adoption in education. Anderson et al. (1998) analyzed their data with respect to Roger's Diffusion of Innovations when studying the skills, behaviors, and attitudes of faculty members related to their information technology use at the University of Alberta. Samarawickrema and Stacey

(2007) used the Diffusion of Innovations theory to analyze data about the adoption of learning management systems (LMS) at an Australian University. Shea, Pickett, and Li (2005) considered Rogers' Diffusion of Innovation model in developing the survey for their study of the adoption of online learning at 33 Universities and Colleges in the state of New York. Kardasz (2013) considered the diffusion of ePortfolio use among faculty members at Stony Brook (NY) University in light of the Diffusion of Innovations Theory.

History of Internet integration in the classroom

Numerous technological innovations to enhance learning in the classroom have been introduced into education over the years. Some have had strong support while others have been rapidly discarded (Groff and Mouza, 2008). One of the first revolutionary technologies used in modern education was the blackboard (Betcher and Lee, 2009). For the nineteenth and twentieth centuries "The blackboard became synonymous with the traditional classroom and, along with shiny red apples, is still seen as a stereotypical symbol of education" (Betcher and Lee, 2009, p. 1). Over the years, technologies such as radio, overhead projectors, movie projectors and the television were introduced into the teacher's toolbox. However, no other technological innovation in education has been more criticized, supported, invested in, and researched than the computer (Tyack & Cuban, 2000). Computer technology was long touted as the savior of education (Collins & Halverson, 2009). However, some have vehemently disagreed with this assertion (Cuban, 2003, Oppenheimer, 2004). Despite opposing views, Tapscott (2009) stated that the most significant change affecting youth in the last 20 years is the computer and the Internet. Therefore, the computer and all other electronic devices that can access the Internet may indeed change education (Collins & Halverson, 2009).

The Internet started in 1969 when scientists at UCLA sent a message to scientists at Stanford University. Although the network crashed after the after the "O" in "LOGIN" was typed, this transmission marked the first step in creating the Internet (Gribbin, 2011). In 1982 the Internet Protocol Suite (TCP/IP) was standardized and the idea of a global network of interconnected systems was born. In 1989 Tim Berners-Lee proposed the World Wide Web that allowed information to be shared among researchers at universities throughout the world. In 1995 the Internet was opened to the entire world (Gribbin, 2011).

At first the Internet, sometimes referred to as the "Web 1.0," was simply a read-only medium which provided one-way, static information (Imperatore, 2009a). Individuals, educational organizations and businesses began to post information about numerous topics and electronic mail (e-mail) was used as a new form of communication. As the years progressed, the amount of information on the Internet grew exponentially. Eventually, the Internet changed from this write only medium to a read/write medium (referred to as Web 2.0) that gave users the ability to discover, create, and organize information and to connect with others interested in the same topics (Thompson, 2007; Imperatore, 2009a; O'Reilly, 2005)

There were many Web 2.0 technologies that teachers used to enhance learning, two of which were Wiki's and Blogs. Catherine Imperatore (2009b) stated that wiki's and blogs were the "two most powerful Web 2.0 tools in a career and technical education" teacher's arsenal (p. 30). Wiki's are collaborative, often password-protected web sites that "allow users to easily add, edit and delete content" (Imperatore, 2009b, p. 30). One study found that writing collaboratively on a wiki made students pay attention

to grammar and structural coherence and resulted in 60% of the students consider their audiences more when writing (Kuteeva, 2010). Wikis also allowed the individuals to have a personalized "learning experience while also experiencing learning as part of a community through collaborating with others in shared activities" (Grant, 2006, p. 9). Web logs, commonly referred to as "blogs," are online journals that allow others to make comments on what the author has written (Imperatore, 2009b). Blogging met today's student's need of immediacy since "blogs enable individuals to write to their Web pages in journalism time–that is hourly, daily, weekly–whereas the Web page culture that preceded it tended to be slower moving: less an equivalent of reportage than of the essay" (Benkler, 2006, p. 217). These forms of social networking (wikis and blogs) helps connect individuals together and allows for asynchronous communication. Felix (2008) found that when teachers and students wrote in a blog, they communicated more effectively and their relationships were strengthened.

Wilson and Gerber (2008) discussed numerous issues dealt with by teacher educators when training future teachers in the digital age. One suggestion they made was to develop course elements that were similar to those found in video games. Among others, they quoted Johnson (2005) who stated that millennial gamers are "eager to soak up information when it is delivered to them in game form" (p. 62). Marc Prensky (2003) maintained that video games are not an evil that should be avoided. In fact, he asserted that video games may be one of the greatest opportunities teachers have to engage students in real learning. Prensky (2001) detailed a game his company developed called *The Monkey Wrench Conspiracy*, which was "phenomenally successful" in teaching mechanical engineers how to use a new computer-aided design (CAD) software package.

West (2012) cited many examples of games used successfully in education including a game called Zombie Division that taught math skills while players fought zombies and an online game called iCivics that increased players' knowledge of civics 13.7%. Many classroom teachers used the game show Jeopardy! as a model to engage students by inserting appropriate questions into that gaming format (Williams, 2008). Almost all of these games have been made available on the Internet.

Podcasting was another way teachers used Internet technologies in education. One school in New Mexico that transported students long distances made use of podcasts outside the classroom. Instead of wasting the 1 to 2 hour(s) it took to get to and from school, students had access to study materials including video, audio, and slide presentations on their daily commutes (Smart, 2008). One might think that many poor students do not have access to this technology, but a 2008 study found that 79% of children ages 12-17 owned a portable mp3 player or iPod (Lenhart, et al., 2010). Teachers used the Internet to host and distribute the Podcast files for student access.

In addition to instruction, the Internet has also been used for student assessment. Assessment, both formative and summative, was an integral part of education and there was a great deal of research showing that Internet-based technologies can be used for effective student assessment. Truell and Alexander (2004) found there was no difference between computer-based or handwritten essay test scores of post-secondary marketing students. However, those taking the computer-based essay test completed their exam significantly faster. Isham (1997) compared paper assessment exams with computerized assessments that included 3-D animations. The study found that students preferred computerized assessments because they believed they were a "great way to take an

exam," they could "see mistakes immediately," and were able to see which areas they needed to relearn (p. 1). Internet-based, collaborative tools such as Google Docs allowed educators to assess learning by allowing students to create authentic, project-based work on web pages, presentations and documents that they can collaborate on and share with the world (Seale, 2010). Online assessments and projects also reduce the amount of paper needed and helped move schools closer to a paperless environment (Wang, 2010).

"Online learning-for students and for teachers-is one of the fastest growing trends in educational uses of technology" (Means, et. al., 2010, p. xi). A large part of online learning involved the use of Learning Management Systems (LMS) (Staker, 2011). Learning Management Systems such as Moodle, Blackboard, Claroline, and many other proprietary systems were used extensively at the post-secondary level and in the work place for online education and classroom enhancement (McGill & Klobas, 2008). Eyitayo (2005) found not only a strong correlation between the use of LMS and course success but also that students believed LMS positively added to the course. In addition, Reigeluth, et. al (2008) stated that LMS "allow teachers to truly customize learning for each learner, and to facilitate choice and control for the learners as they work towards mastery of required attainments" (p. 38). One of the newest platforms for LMS was Google Classroom, which included the previously mentioned Google Docs. Roberts (2013) studied using Google Docs to facilitate silent discussions in classrooms. Google Classroom is rapidly becoming the leader in LMS for secondary education. In fact, Lanier (2017) reported that 68% of the nation's primary and secondary school students used Google education apps.

One of the newest ways the Internet was used in education was social media. Social Media referred to the collaboration among individuals in order to create, share or exchange information through text, pictures and/or videos in virtual communities and networks (Ahlqvist, et al., 2008). Kaplan and Haenlein (2010) defined social media as a group of Internet-based applications that allow the creation and exchange of user-generated content. Although, social media technologies were not originally designed for use in teaching and learning, continued growth led to their proliferation as a tool in education (Harasim, 2012). Although new ones are constantly being developed and released and old ones are being taken offline, a few of the most recent social media technologies used in education were Instagram, Twitter, Facebook, Snapchat and Pinterest (Grote-Garcia and Vasinda, 2014; Al-Bahrani and Patel, 2015; Kitchakarn, 2016; Silverman and Piedmont, 2016).

Internet-enhanced instruction at the Post-secondary level

There is a great deal of literature dealing with Internet-enhanced education at the Post-secondary level. The majority of this literature focused on comparing distance learning, including online learning, to face-to-face classes. In fact, Bernard, et. al. (2014) stated that there were "literally thousands of comparative primary studies" (p. 99) that compared distance education to classroom instruction. Upon investigating these studies, they found the research showed there was little difference between the effectiveness of online studies and classroom instruction. Despite being a subtle distinction, Linder, et. al. (2003) found that although student success in distance education was very similar to classroom instruction, students in face-to-face classes experienced engagement earlier, they remained engaged longer, and often completed the course sooner than distance

students. Although both online and classroom instruction are effective, some studies found that a blending of classroom instruction and online learning were preferred. In a meta-analysis of forty-five studies of post-secondary students, Means et al. (2013) found classrooms that blended online learning with face-to-face instruction significantly outperformed those with only classroom instruction.

Internet-enhanced instruction in Secondary Academic disciplines

Fewer studies focused on using Internet-enhanced instruction at the middle school and secondary level in academic disciplines. Berge and Mulienberg (2003) reported that approximately two-thirds of all schools reported that the majority of teachers use the Internet for instructional purposes. One type of Internet-enhanced learning strategy was called a flipped classroom. The flipped classroom revolved around students doing the majority of learning at home by viewing videos and websites. This allowed teachers to use class time for application of knowledge, and for collaboration and enrichment activities (Chen, 2016). Studies revealed that flipped classrooms are more efficient and may improve academic achievement, promote self-paced learning, and increase student–teacher interaction (Acedo, 2013; Finkel, 2012; Goodwin & Miller, 2013; Herreid & Schiller, 2013)

Internet-enhanced instruction in CTE and Agricultural Education

When compared with the academic disciplines, research into Internet-enhanced instruction in middle school and secondary Career, Technical and Agricultural Education (CTAE) classrooms were done to a much lesser degree. A Mississippi Agricultural and Environmental Science and Technology course of study required students to use computers to access content on the web, journal their experiences and submit unit

evaluations (Swortzel, Deeds, & Taylor, 2004). Kotrlik and Redmann (2009) found that Louisiana Career Technical Educators (CTE) teachers have "substantially adopted technology for use in instruction …" (p. 70). However, most of the "technology" they referred to was things such as Global Positioning System (GPS) units and interactive DVD's. In fact, the authors stated that "These findings suggest that changing teaching practices and styles may not necessarily be a result of integrating the Internet" (p. 70). Williams, Warner, Flowers, & Croom (2014) found that Agricultural Education teachers in North Carolina used technology more for teacher-focused activities than for student-focused activities. Peckham and Iverson (2000) found that approximately 37% of Georgia Agricultural Education teachers surveyed used the Internet in their Agricultural Education programs while Layfield, et al. (2000) found that 50% of Pennsylvania Agricultural Education teachers surveyed used the Internet in instruction.

Barriers to Technology Integration

Numerous barriers existed that prevented the integration of technology including the Internet into classroom settings. For teachers, these barriers were broken down into two main categories, extrinsic, or first-order, and intrinsic, or second-order, barriers (Ertmer, 1999; 2005). First-order barriers were external (extrinsic) factors such as time constraints, technical difficulties, lack of support from administration and lack of availability and access to computers (Ertmer, 1999; 2005; Franklin, 2007; Gilakjani, 2013; Inan & Lowther, 2010; Korte, & Hüsing, 2007; Muilenburg & Berg, 2003; Wang, 2017). Second-order barriers were internal (intrinsic) factors such as teachers' confidence performing, attitudes towards, and beliefs about technology integration. Ertmer (1999; 2005) posited teachers were often unwilling to adopt technology in the

classroom even if all first-order barriers were removed. Further teachers often relied on past experience and their own beliefs when faced with the potential of utilizing new technologies (Hord et al. 2006; Fullan, 2015).

The literature revealed that the attitudes of a secondary student towards technology resulted from his previous exposure to technology (Huang, 2002), how he had experienced using technology (Busch, 1995; Necessary & Parrish; 1996, Mitra, et. al, 1999) or how he had been trained to use technology (Dusick & Yildirim, 2000). For post-secondary students, the literature suggested that the integration of technology in a student's daily life formed his attitudes toward computers before his college years (Jones, Johnson-Yale, Millermaier, & Pérez, 2009; Tapscott, 2009; Wangemann, Lewis & Squires, 2003).

Summary

The literature revealed that technology allowed for differentiation in the classroom by providing students with on-demand exposure to learning materials and by allowing them to use their creativity to collaborate and share knowledge. The Diffusion of Innovations is an appropriate theoretical framework to use as a lens to examine the use of the Internet in Agricultural education because 1) it was first used to examine how farmers (agriculturalists) adopted new agricultural production practices and 2) it has often been used to describe technology adoption in education.

Since the Internet was established in 1969 with the first transmission of data, it has evolved into a read/write medium that gives users the ability to discover, create, organize and share information. Internet technology such as Wiki's, Blogs, online

games, podcasting and online assessments made an impact on how teachers use the Internet to enhance learning in the classroom.

A great deal of research focused on integrating distance learning at the post-secondary level, while though extensive, there was significantly fewer studies at the secondary level, especially in CTAE courses. The last study that examined Internet use by Georgia Agricultural Education teachers was in 2000 (Peckham & Iverson). Finally, the literature revealed several key extrinsic and intrinsic factors that affected teachers integrating technology into their classrooms. The extrinsic factors were time constraints, technical difficulties, lack of administrative support, and lack of Internet-connected devices. The intrinsic factors were teacher confidence, attitudes and beliefs in regards to using technology in the classroom.

Chapter III

RESEARCH METHODOLOGY

Introduction

This chapter begins with a review of the major elements presented in Chapter 1 and includes the statement of the problem, purpose of the study, the research questions, and the significance of the study. Then the research design, methodology and analysis of the data will be presented. All of these topics will work together to describe and elucidate the direction and ultimate goals of this research study.

Statement of the Problem

The need for this study arose from the rapid advances in Internet technology made every year combined with the increasing availability of the Internet to students. Therefore, it is important to continually investigate how secondary agriculture teachers use and view Internet-enhanced teaching in order to effectively utilize this educational tool. The problem is that current research falls short of describing Internet use by secondary Agricultural Education teachers in Georgia and the barriers present that would hinder them from effectively enhancing their classrooms using the Internet.

Purpose of the Study

The primary purpose of this study was to describe the extent and type of the use of Internet-enhanced instruction by secondary Agricultural Education teachers in Georgia. This study also described the perceived factors that either encourage or

discourage the implementation of such instruction in secondary Agricultural Education classes in Georgia. Finally, this study provided insight into the kinds of professional development Agricultural Education teachers need in order to integrate the Internet into their instruction.

Research Questions

The following research questions were used to guide this study:

1. What is the reported extent of the use of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participated in the study?
2. What are the current uses of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participated in the study?
3. What are the demographic and perceived intrinsic and extrinsic factors and variables that encourage the use of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participated in the study?
4. What are the demographic and perceived inhibiting factors and variables that discourage the use of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participated in the study?
5. What professional development opportunities for using Internet-enhanced instructional strategies are needed by Georgia secondary Agricultural Education teachers who participated in the study?

Significance of the Study

By answering these questions, this study provided new insight into the extent to which and how Georgia Agricultural Education teachers used technology to create

Internet-enhanced instruction as well as identify factors that may encourage or discourage the implementation of such teaching strategies to enhance learning for students. This study also provided data for Agricultural Education teachers to determine successful practices and how to implement these teaching strategies. This information can be used to suggest ways to ameliorate the perceived inhibitions and improve learning in all CTAE classrooms in the United States. Additionally, this study provided insight into areas of professional development that would be useful for administrators and state program leaders with regards to the further implementation and use of Internet-enhanced instructional strategies.

Research Design

As previously mentioned, the theoretical drive or framework for this study was the Diffusion of Innovations popularized by Everett Rogers (2003). Creswell (2009) stated that "research designs are plans and procedures for research that span the decisions from broad assumptions to detailed methods of data collection and analysis" (p. 3). The design for this research study was a mixed methods project. In their book *Mixed Method Design,* Morse & Niehaus (2009) stated that a mixed method (or multiple method) study "is a series of complete related qualitative and/or quantitative research projects, driven by the theoretical thrust of the program" (p. 13). Jennifer Greene (2007), stated that mixed method research "involves an openness to multiple ways of seeing and hearing, multiple ways of making sense of the social world, and multiple standpoints on what is important and to be valued and cherished." (p. xii). Creswell (2009) also stated that in order to compensate for the limitations of individual research methods, using a mixed methods

design allowed the "biases inherent in any single method" to "neutralize or cancel the biases of other methods" (p. 14).

This research study utilized a quantitatively-driven mixed methods or QUAN-qual design. In this design the qualitative portion is not rigorous enough to stand alone or be separately publishable (Morse & Niehaus, 2009). Adding the qualitative component to the quantitative portion of the research helped clarify, enrich and develop more in depth understanding and validation of the quantitative results (Morse & Niehaus, 2009). Quantitative data was collected first and then the qualitative data was collected, coded, transposed and moved into the quantitative data for analysis (Morse & Niehaus, 2009). This type of design led not only to an understanding of the meaningfulness and effectiveness of a given program design (in this case using the Internet to enhance classroom learning) but also gave a better understanding of how best to address a social problem (Greene, 2007).

For the quantitative portion of this research design, an online survey was used as the instrument to gather data from participants. The goals of the research questions sought to determine the extent and degree of use of the Internet, perceived enablers and inhibitors of the Internet, and demographic information. A survey method of design provided a "numeric description of trends, attitudes or opinions of a population" (Creswell, 2009, p. 145). The qualitative portion of the research utilized a basic interpretive design using semi-structured interviews that contained a "mix of more and less structured questions" (Merriam, 2002, p. 13). The goals of the interviews were to validate and reach a deeper understanding of the survey results and get specific details of the utilization of the Internet and professional development needs. Patton (2002) stated

that interviews were useful for studying a particular subject because they allowed the researcher to "find out what is in an on someone else's mind, to gather their stories" (p. 341). The findings from the quantitative survey were combined with the results of the qualitative interviews to develop the study's conclusions and recommendations.

Population and Sample

The population for the survey portion of the study was all secondary Agriculture Education teachers in the state of Georgia. Secondary Agriculture Education programs included those that served students in grades 6-12. The target population ($N = 466$) consisting of all secondary agriculture education teachers in Georgia were asked to participate in the research study. The listing of programs was gathered from the 2016-2017 Georgia Agricultural Education Annual Report (Georgia Agricultural Education, 2017). Creswell (2009) identified this method of selecting the population as single-stage selection where the "researcher has access to names in the population and can sample the people (or other elements) directly" (p. 148).

The sample for the qualitative or interview portion of the study came from an analysis of the quantitative, survey data. The population of potential interview participants were those who provided e-mail addresses, thus providing a willingness and consent to be interviewed (N = 55). Out of this group, 8 individuals were purposefully selected based on demographic and response types that "best help the researcher understand the problem and the research question" (Creswell, 2009, p. 178).

Instrumentation

Survey Data Collection

The research instrument used for the survey portion of the study was a modified version of "Perceptions of Computers & Technology" (Hogarty, Lang, & Kromrey, 2003). This instrument closely matched the purpose of this study because it was designed to measure teachers' reported use of technology in their classroom and their attitudes toward computers. It analyzed a handful of subcategories that included intrinsic and extrinsic factors that affect technology integration. These subcategories included: preparation, confidence and comfort; attitudes toward Internet use; ways the Internet is used; and support. With permission from the author of the survey, the instrument was modified to better accommodate the specific population and the specific research questions. See Appendix E for the original survey instrument. The survey instrument can be found in Appendix B. This instrument was ported to the Qualtrics platform for electronic distribution to all survey participants.

The instrument contained six sections: 1) A set of 16 questions about demographic/program characteristics and Internet-enhanced course delivery used by Agricultural Education teachers; 2) Seven questions that measured on a five-point, Likert scale (1= Not at all, 2=Small Extent, 3=Moderate Extent, 4=Great Extent, and 5=Entirely) Teacher Preparation and Professional Development for Internet Use as well as two open-ended opportunities to submit information not addressed by the items of the section; 3) Nine questions that measured on a five-point, Likert scale (1=strongly disagree, 2=Somewhat disagree, 3=Neither agree nor disagree, 4=Somewhat agree, and 5=strongly agree) Confidence and Comfort using the Internet; 4) Twelve questions that

measured on a five-point, Likert scale (1=strongly disagree, 2=Somewhat disagree, 3=Neither agree nor disagree, 4=Somewhat agree, and 5=strongly agree) Attitudes Toward Internet Use; 5) Thirteen questions that measured on a five-point, Likert scale (1= Not at all, 2=Small Extent, 3=Moderate Extent, 4=Great Extent, and 5=Entirely) Using the Internet in the Classroom as well as an open-ended opportunity to submit information not addressed by the items of the section; and 6) Twelve questions that measured on a five-point, Likert scale (1=strongly disagree, 2=Somewhat disagree, 3=Neither agree nor disagree, 4=Somewhat agree, and 5=strongly agree) General School Support as well as an open-ended opportunity to submit information not addressed by the items of the section. A final question was added at the end asking if the participant would be willing to be interviewed about the survey by supplying an e-mail address.

Hogarty, Lang, and Kromrey (2003) developed a survey instrument and conducted validity and reliability research on the instrument. "The primary goal of this research was to develop and validate an instrument that would provide data to foster a better understanding of how educators and students use technology in the classroom" (p. 140). "Exploratory factor analysis was conducted within each section of the instrument, and the composite scores showed acceptable levels of reliability (with coefficient alpha ranging from .74 to .92)" (p. 158).

The original survey instrument titled "Perceptions of Computers and Technology" (Hogarty, Lang, & Kromrey, 2003) was retitled to match the research questions of this study. The title was changed from "Perceptions of Computers and Technology" to "Survey of Internet-enhanced Instruction in Georgia Secondary Agricultural Education." The original purpose of the survey stated:

> This survey is designed to gain a better understanding of how educators use technology in the classroom and their level of experience with computers. The survey includes sections addressing level of confidence, skill, support, and uses of computers and technology in teaching. Responses will be kept strictly confidential and individual responses will not be identified or reported. Your participation is voluntary.

This purpose statement was altered to read:

> This survey is designed to gain a better understanding of how Agricultural Educators use the Internet in the classroom. The survey includes sections addressing demographics, teacher preparation, level of confidence, support, attitudes and uses of the Internet in teaching. Responses will be kept strictly confidential and individual responses will not be identified or reported. Your participation is voluntary.

Next the demographics section was adapted to allow me to gather important information about the participants in the study. The original instrument asked ten questions including the participant's: 1) mother's maiden name, 2) gender, 3) highest degree earned, 4) college attended, 5) total years' experience teaching, 6) level taught at 7) average number of students per class, 8) number of years using instructional technology, 9) access to multimedia classroom and 10) how often meetings are held in said classroom. The instrument was modified by changing the first question to ask "Click yes if you are 18 years or older and consent to participate in this survey." The reason for this question was to satisfy the requirements to the Institutional Review Board

and obtain each respondent's permission. There were 16 demographic questions included in the new instrument strictly for gathering demographic and basic Internet usage data (see Appendix B). These were: 1) area of school, 2) community type, 3) total years teaching Agricultural Education, 4) total years teaching in any field, 5) grade level taught, 6) age, 7) gender, 8) highest degree, 9) certification method, 10) Agricultural Education course(s) taught, 11) location of student Internet use, 12) hours per week students used Internet, 13) number of teachers in department, 14) number of Internet-connected devices, 15) Internet-connected platform and 16) learning management system used.

For the second section of the survey instrument, the title was changed from "Preparation for Computer Use" to "Teacher Preparation and Professional Development for Internet Use." The directions were changed from "For the following items please circle the one response that best reflects the extent to which you've acquired computer skills from the following sources" to "Select the one response that best reflects the extent to which you've acquired skills for using the Internet from the following sources." In the original instrument there were 5 sources of learning that included:

As part of your undergraduate or graduate coursework

Workshops

Independent learning (e.g., online tutorials or books)

Interaction with other faculty / staff

Distance Learning courses.

The section containing the part "To what extent do you think the following types of computer education would be beneficial to you?" was removed. In order to better

represent possible sources of learning about Internet use that are available to agriculture teachers the following survey questions were included and/or added:

1) As part of your undergraduate work
2) In-service or professional development courses / Workshops
3) Independent Learning (e.g. online tutorials or books)
4) Interaction with other faculty / staff
5) Interaction with other agriculture teachers
6) Distance Learning courses
7) From my students
8) An open ended question:

   Other source(s) of teacher preparation or professional development (please list) _____
9) An open ended question:

   Please list any areas for which you need professional development regarding using the Internet in your classroom (e.g. record keeping, course delivery, research, etc.)_____

The title of the third section was changed from "Confidence and Comfort Using Computers" to "Confidence and Comfort Using the Internet." The directions were changed from "Please read the following statements and circle the one response that best reflects your level of agreement" to "Select the one response that best reflects your level of agreement." The original instrument included nine statements to which the participant was asked to agree or disagree on a 5 point Likert scale, which were:

I have had adequate training in using computers

I use computers effectively in my teaching

I am comfortable giving computer assignments to my students

The computer enhances my teaching

I am comfortable using computers during instruction in a multimedia classroom

My use of computer technology enhances student performance

Incorporating multi-media into lessons enhances teaching

I am comfortable with computer terminology

I am developing expertise in the uses of technology in the classroom

The statements were changed slightly to the following to better answer the research questions of the study:

1) I have had adequate training in using the Internet in my classroom.
2) I use the Internet effectively in my classroom.
3) I am comfortable using the Internet during my classroom instruction.
4) I am comfortable giving Internet assignments to my students.
5) Incorporating the Internet into lessons enhances my teaching.
6) My use of the Internet enhances my students' performance.
7) I am comfortable navigating the Internet.
8) I am confident that I can find answers to my students' Internet-related questions.
9) I am developing my expertise on how to use the Internet in the classroom.

The fourth section of the original survey instrument titled "General Institutional Support" was moved to the end of the survey for logistical purposes. The directions were

changed from “Please read the following items and circle one response that best represents you level of agreement” to “Select the one response that best reflects your level of agreement.” In the original instrument there were 8 statements about institutional support that included:

I have adequate time to learn technology skills.

I have sufficient access to technology.

I receive a sufficient level of technology related support at my university.

Faculty members encourage the use of technology.

The administration supports technology related training.

The administration actively encourages the use of technology in the classroom.

The administration actively encourages the use of technology outside the classroom.

Again, because this survey is about secondary agricultural educators’ use of the Internet, the following items were included:

1) I receive a sufficient level of Internet-related support at my school.
2) The administration supports Internet-related training for teachers.
3) The administration actively encourages teachers to use the Internet in the classroom.
4) At my school, teachers have time to learn how to use the Internet in the classroom.
5) At my school, teachers share ideas about how to use the Internet in the classroom.
6) I have sufficient equipment needed in my classroom to access the Internet

7) I have sufficient, reliable Internet access in my classroom.

8) I work with colleagues who use the Internet in their classrooms.

9) I have technical support staff knowledgeable of Internet at my school.

10) The technical support staff at my school adequately assists me in problem solving and trouble shooting

11) I have access to a computer lab with Internet capabilities.

12) My school district has an ongoing plan for staff development on the Internet.

13) An open ended question:

Please comment about the support you do or do not receive from your school for using the Internet in your classroom._____

The fifth section titled "Types of software used for teaching/for incorporating instructional technology" was deleted as it was not pertinent to this study.

The sixth section titled "Integration of technology into the classroom" was moved next to last for logistical purposes and the title was changed to "Using the Internet in the Classroom" to better relate to the purposes of the study. The original directions stated "Listed below are teaching modes in which technology may be used. Indicate how often you use technology in each teaching mode. If you feel an item does not apply then circle (NA)." These directions were changed to read "Listed below are teaching methods in which the Internet may be used. Indicate how often you use the Internet in each teaching method." The last answer choice "Not Applicable" was removed not only because it was not necessary for the study but also in order to allow for multivariate analysis of variance. The original survey had eleven statements:

Small group instruction

Individual instruction

Cooperative groups

Independent learning

To tutor

To promote student centered learning

As a research tool for students

As a problem solving/decision making tool

As a productivity tool (to create charts, reports or other products)

As a classroom presentation tool

As a communication tool (e.g., e-mail, electronic discussion)

These statements were changed to:

1) Small group instruction
2) Individual instruction
3) As a reward
4) Independent learning
5) To tutor
6) To promote student-centered learning
7) As a research tool for students
8) To administer tests and quizzes
9) As a communication tool (e.g. e-mail, electronic discussion, FFA promotion)
10) As a classroom presentation tool
11) Contest (Career Development Event) preparation
12) To archive presentations or forms

13) Record keeping (Supervised Agricultural Experience) instruction

14) An open ended question:

Other ways I use the Internet in my classroom (please list)_____

The next two sections titled "Your personal use of technology" and "Technical support" were deleted as the former was not pertinent to this study and the latter was covered in the last section of the modified survey.

The final section of the original survey was moved to the fourth section of the modified survey for logistical purposes. The title was changed from "Attitudes towards computer use" to "Attitudes Toward Internet Use." The original directions, which read "The following statements address general attitudes towards computer use. Please circle the one answer that best reflects your level of agreement" were changed to "Select the one response that best reflects your level of agreement." The original survey had twenty statements that included:

I would like every student in my classes to have access to a computer.

Computer skills are essential to my students.

I feel tense when people start talking about computers.

I feel pressure from others to integrate the computer more into my classroom.

I would like my students to be able to use the computer more.

Computers are dehumanizing.

I avoid the computer whenever possible.

Computer instruction is just another fad.

The use of computers should be confined to computer courses.

I like using the computer to solve complex problems.

More training would increase my use of the computer in the classroom.

Computers diminish my role as a teacher.

Computers should be incorporated into the classroom curriculum.

Computers make my job easier.

Computers further the gap between students along socio-economic lines.

Computer skills will help me as a professional.

Learning computers make high demands on my professional time.

Computers change my role as a teacher.

I can help others solve computer problems.

Computers enhance classroom instruction.

The statements were modified to the following:

1) I would like my students to be able to use the Internet more in my classroom.
2) The ability to effectively use the Internet in my classroom is essential to my students' success.
3) I feel tense when people start talking about the Internet.
4) I feel pressure from others to integrate the Internet into my classroom.
5) I avoid the Internet whenever possible.
6) Using the Internet in the classroom is just another fad.
7) The Internet diminishes my role as a teacher.
8) More training would increase my use of the Internet in the classroom.
9) The Internet should be incorporated into the classroom curriculum.
10) The Internet enhances classroom instruction.
11) The Internet makes my job easier.

12) Learning how to incorporate the Internet in the classroom requires a great deal of my professional time.

A final, open-ended question was added at the end of the survey asking if the participant would be willing to be interviewed about the survey by supplying an e-mail address.

In order to address issues of face and content validity and readability due to modifications to the instrument for this research, a pilot study was conducted with four former Georgia Agriculture Teachers. These former teachers examined the survey and provided suggested revisions, most of which were incorporated into the survey (See Appendix C).

A post-hoc reliability analysis of the modified survey instrument was conducted using a Cronbachs' Alpha test in SPSS V24 (IBM Statistical Package for the Social Sciences, 2016). Cronbach's alpha is an estimate of the internal consistency associated with the scores that can be derived from a composite score (Cronbach, 1951). The Teacher Preparation and Professional Development for Internet Use construct yielded an alpha of .703; the Confidence and Comfort Using the Internet construct yielded an alpha of .881; the Attitudes Toward Internet Use construct had an alpha of .712; the Using the Internet construct yielded an alpha of .835; and the General School Support construct had an alpha of .875. An overall alpha of .880 was found for all 53 Likert-type items. In the original survey used as the base for this study, Hogarty, Lang, & Kromrey, (2003) reported an overall reliability range of .74 to .92 in their constructs. Therefore, the modified survey used in this study has as good or better internal consistency than the original survey.

Interview Data Collection

Semi-structured, telephone interviews were used as the data collection method for the interview portion of the study (Morse & Niehaus, 2009). Greene (2007) stated that combining surveys and interviews into a "blended" study allows for a more "complete portrait" of the phenomenon of interest than either a survey or interview alone (p. 127). An interview protocol was used to ask questions and record answers (Creswell, 2009). This protocol included the following components as outlined by Creswell (2009, p. 183):

- A heading that included the date, interviewer, and interviewee;
- An introductory ice-breaker question;
- Nine probing questions that resulted from the quantitative data;
- Space between each question to record responses; and
- A final thank you statement to the interviewee.

The purposes of the interviews were 1) to obtain general opinions and reactions to the results of the survey 2) to solicit opinions and observations about the specific Internet-enhanced instructional activities reported by participants (research questions one and two) 3) to solicit opinions and observations regarding enabling or inhibiting factors on reported adoption of Internet-enhanced instructional strategies (research questions three and four). Additionally, the interviews sought 4) to solicit and gather recommendations for professional development to improve Internet-enhanced instruction for Secondary Agricultural Education programs (research question five). The interview questionnaire was reviewed by members of the dissertation committee for variables and readability (see Appendix H for Interview Questionnaire).

Interviewees were selected by sampling for "maximum variation (heterogeneity)" (Patton, 2002, p. 234). Individuals were purposefully selected out of the 55 individuals who provided their e-mail address and were based on a most even distribution of the demographic variables of age, years of teaching, community type, program level, single or multi-teacher programs, certification type, highest degree and gender. Out of these 55, 8 individuals were selected that covered the range of all the demographic variables including one individual who reported not using the Internet to enhance classroom learning.

Research Procedures

The procedure for implementing the collection of the data involved several steps. Upon acceptance of this proposal by the dissertation committee, approval from the Valdosta State University's Institutional Review Board was obtained to begin conducting the research (see Appendix A for IRB Approval). The projected time frame for data collection was July, 2017-October, 2017. The research process began with requesting support for the research study from the Georgia Department of Education Division of Agriculture. I asked the leadership board of the Georgia Vocational Agricultural Teachers Association (GVATA) if this research could be announced at the 2017 GVATA Summer Conference. I addressed all attending secondary teachers of agricultural education programs in Georgia during the annual Sumer GVATA conference held July 9-12, 2017. All secondary agriculture education program teachers at the conference were asked to participate by completing the survey instrument online.

An e-mail was sent on July 27, 2017 to all Georgia Agriculture teachers requesting their participation in the study and providing an electronic link to the Qualtrics

survey instrument (Appendix F). A follow up e-mail was sent to all agriculture teachers seven days later reminding those that have not participated to please complete the survey. A final reminder e-mail was sent out three days before the survey closed on August 25, 2017.

After the survey data were analyzed, telephone interviews were conducted with selected participants based on the results of the survey data. As previously mentioned, 55 participants provided an e-mail address on his/her survey. From these, 8 individuals were purposefully selected to represent the range of all the demographic variables. I began the interview process by sending a letter by e-mail to each agriculture teacher selected for interviews on October 19, 2017 (see Appendix G). I asked teachers to respond with a best time to call for the interview and to provide a telephone number for reaching the respondent. Once all agriculture teachers selected had responded, I began the interview process. The first interview was conducted on December 14, 2017 and the final interview was conducted on December 31, 2017.

All interviews were conducted by telephone. For each interview, responses to interview questions were recorded by hand on the interview questionnaire (see Appendix H for Interview Questionnaire) as well as digitally recorded using the iOS application TapeACall. This mobile application digitally recorded the telephone conversations thus allowing me to review interview responses and directly quote appropriate responses. The average length of time for interviews was 20 minutes with a range of 15 to 30 minutes. Seidman (2006) stated the most reliable way to work with the words of participants was "to transform those spoken words into a written text to study" (p. 114) and the best way to accomplish this was "to tape-record the interviews and to transcribe them" (p. 114). I

also provided participants with feedback during the interview to assure them that the interview was accomplishing its purposes (Patton, 2002).

After interviews were conducted, each interview was transcribed (See Appendix J for the entire transcription). This method was done to avoid losing any portion of the interviews instead of "preselecting parts of the recorded interviews to transcribe and omitting others" (Seidman, 2006, p. 115). The data were visually scanned and organized into different categories of responses per question. The data were carefully read to reach an overall understanding of its meaning and content. Responses to each question were taken from the digital transcripts and placed into a Microsoft Excel 2016 Edition spreadsheet (Microsoft Inc, 2016). A separate sheet was used for data from each question. Following this analysis, the data were coded and categorized (see Appendix I for Interview Responses and Analysis). From the coded data, major themes were identified for each interview question.

I took precautions to ensure that data were gathered accurately from the interviews by listening to the digital recording several times and by ensuring that notes were thorough and comprehensive so that all quotations were recorded accurately (Patton, 2002). Patton (2002) stated that an interview is a "connection" not an "interrogation" and that the researcher should provide feedback and reinforcement to let the interviewee know the interview's purpose and how the interview is progressing (p. 374). I also reasonably maintained control of the interview to manage time wisely and to prevent irrelevant remarks, digressions and diatribes (Patton, 2002).

Survey Data Analysis

Data analysis methods for each research question are described below. After participants completed the research instrument, the methodology used for analysis was based on steps outlined in *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (Creswell, 2009).

Demographic Analysis

- Demographic information for all respondents who completed the online survey.
- Tables were used to report non-parametric descriptive statistics such as frequencies, percentages, means, and standard deviations for the demographic data.

Research Question One Data Analysis

What is the reported extent of the use of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participate in the study?

- The data for the extent of Internet use was analyzed for all respondents who completed the online survey. These included: 1) Hours Per Week Students Reportedly Used the Internet for Instructional Purposes, 2) Location of Internet Use, 3) Type of Learning Management Systems (LMS) Reported, 4) Number of Internet-connected Devices Available in Classroom, and 5) Types of Internet-connected Devices Available in the Classroom.
- Tables were used to report non-parametric descriptive statistics such as percentages and means for the Internet use data.

Research Question Two Data Analysis

What are the current uses of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participate in the study?

- The data for the type of Internet use was analyzed for all respondents who completed the online survey. These Internet uses included: "Small group instruction," "Individual instruction," "As a reward," "Independent learning, "To tutor," "To promote student-centered learning," "As a research tool for students," "To administer tests and quizzes," "As a communication tool," "As a classroom presentation tool," "Contest preparations," "To archive presentations and forms" and "Record keeping instruction."
- Tables were used to report non-parametric descriptive statistics such as means, and standard deviations for the Internet use data.
- Comments for other ways to use the Internet were also summarized.

Research Question Three and Four Data Analysis

What are the demographic and perceived intrinsic and extrinsic factors and variables that encourage the use of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participate in the study?

What are the demographic and perceived inhibiting factors and variables that discourage the use of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participate in the study?

- The data for Internet use were separated by demographical characteristics including: gender, age, years of experience, community type, program level, highest degree and certification method.

- Tables were used to report non-parametric descriptive statistical means for the data of participant ratings of Internet use for each demographic variable.
- Tables were used to report descriptive statistics such as means, and standard deviations for the data of participant ratings of Teacher Preparation and Professional Development for Internet Use.
- Tables were used to report descriptive statistics such as means, and standard deviations for the data of participant ratings of General Schools Support.
- Tables were used to report descriptive statistics such as means, and standard deviations for the data of participant ratings of Confidence and Comfort Using the Internet.
- Tables were used to report descriptive statistics such as means, and standard deviations for the data of participant ratings of Attitudes Toward Internet Use.
- SPSS 24.0 for Windows (IBM Statistical Package for the Social Sciences, 2016), software was used for all statistical calculations. Multivariate Analysis of Variance (MANOVA) tests were run on the four variables of age, years of teaching experience, number of hours using the Internet per week, and the number of Internet-connected devices in the respondents' rooms to determine significant differences between demographic and perceived situational variables that impacted the implementation of Internet-enhanced instructional strategies.

Research Question Five Data Analysis

What professional development opportunities for using Internet-enhanced instructional strategies are needed by Georgia secondary Agricultural Education teachers who participate in the study?

- Comments areas for which they needed professional development for Internet use were summarized.

Interview Data Analysis

Patton (2002) stated that "Qualitative analysis transforms data into finding" (p. 432). Care was taken to make ethical decisions regarding the data analysis and interpretation. As the research was conducted, I avoided using language or wording that would be biased against any population group. The transcripts of the study are reported in Appendix J so that others can judge the credibility of the research.

Once all data was collected from the individual interviews, the responses were analyzed using proven qualitative methods of analysis. These qualitative methods included such practices as coding, interpretation of themes, and description (Creswell, 2009). Creswell (2009) outlined several steps that should be taken when analyzing qualitative data. These were:

1. Interview data was transcribed, then the data were visually scanned and then organized and arranged by question.
2. All data were carefully read to reach a "general sense" (p. 185) of their meaning and content.
3. Data was then coded and categorized. This was accomplished by placing all responses from each interview question into a spreadsheet. These responses were then coded to identify the category of the response.
4. From the coded data, major themes were identified.

Once the major themes were identified, they were described in more detail and a list of enablers and barriers was developed. Additionally, recommendations about

potential professional development needs to improve integrating the Internet into educational programs are discussed in Chapter 5.

Reliability was continuously checked during this portion of the analysis by checking the transcript to avoid obvious mistakes and by ensuring that there was not a change in the meaning of the codes during the coding process (Creswell, 2009). In addition, I strove to limit any bias I brought to the research study, thus adding to the validity of the research. Maxwell (2005) stated that "*Any* view is a view *from some perspective*, and therefore is shaped by the location (social and theoretical) and 'lens' of the observer" (p. 39). Maxwell (2005) further emphasized that the researcher must be aware of any subjective biases that may influence the researcher's study. I have spent the entirety of my career involved with agricultural education and have always endeavored to integrate technology into the classroom. As such I have dealt with many of my own perceived challenges when integrating the Internet into the classroom. Because of these experiences and background, I realized that I had many preconceived notions about what factors may in fact inhibit or encourage Internet use in the classroom. Mawell (2005) stated that "it is impossible to deal with these issues (bias) by eliminating the researcher's theories, beliefs, and perceptual 'lens'" (p.108), but by being aware of my own subjective biases, I strove to let the data speak for itself and constantly checked to ensure that my own theories, beliefs, and perceptual lens were not inserted into the narrative.

The final analysis was a comparative analysis across the quantitative and qualitative data sets. The theoretical framework of the Diffusion of Innovations was also included to allow for contextual meaning and interpretation of the results. This comparative analysis led to conclusions and recommendations of the study.

CHAPTER IV

FINDINGS

Introduction

The primary purpose of this study was to describe the extent and type of the use of Internet-enhanced instruction by secondary Agricultural Education teachers in Georgia. Additionally, this study sought to describe the perceived factors that encouraged or discouraged the implementation of such instruction, and to provide insight into the kinds of professional development Agricultural Education teachers need in order to integrate the Internet into their instruction. The population for this study consisted of all secondary Agricultural Education teachers in Georgia (N = 466) based on the latest program update of 2017 (Georgia Agricultural Education, 2017). There were 282 participants that initiated the survey, but only 237 participants actually completed the survey. Some of my findings were based on the responses of the 237 participants (50.9% of requests) who completed the survey titled "A Descriptive Study of Internet-enhanced Instruction in Georgia Secondary Agricultural Education." Other findings were derived from a Multivariate Analysis of Variance for selected variables. Findings are reported from telephone interviews conducted with a purposeful sample of the survey participants that reflected the demographic variables of gender, age, years of experience, community type, program level, highest degree and certification method. Responses to the open-ended questions were analyzed to describe perceived factors that encouraged or

discouraged the implementation of Internet-enhanced instruction as well as to determine recommendations for professional development in this area.

Review of Research Questions

In this chapter, detailed findings and a discussion of the analysis of data are presented as guided by the research questions:

1. What is the reported extent of the use of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participated in the study?
2. What are the current uses of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participated in the study?
3. What are the demographic and perceived intrinsic and extrinsic factors and variables that encourage the use of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participated in the study?
4. What are the demographic and perceived inhibiting factors and variables that discourage the use of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participated in the study?
5. What professional development opportunities for using Internet-enhanced instructional strategies are needed by Georgia secondary Agricultural Education teachers who participated in the study?

Section One: Online Survey Results

Demographic Data Analysis

An e-mail invitation to participate in the survey was sent to every secondary Agricultural Education teacher in Georgia (N = 466) through the Agricultural Education

list serve starting July 27, 2017 and closing on August 25, 2017. A total of 263 respondents (56.44%) began the survey. Not all respondents fully completed the survey. The 19 respondents who did not complete the survey and one response from an individual who took the survey twice were not included in the statistical analysis. Additionally, 6 respondents were state staff members who did not teach students in the classroom and were also not included in the statistical analysis. For this analysis, I used data from 237 participants (50.9%) who fully completed the survey during the active period, and were not state staff members.

The first portion of the demographic section asked participants to identify the Georgia Agricultural Education area in which his/her school was located. The responses are shown in Table 1. The results indicated that the distribution of survey respondents by area was a fairly accurate representation of the actual distribution of Agriculture teachers in the state of Georgia (Georgia Agricultural Education, 2017) since there was only a few percentage points difference between the two. In the North Region there were 45 (19.0%) respondents in Area 1 and 50 (21.1%) respondents in Area 2. Representing the Central Region were 46 (19.4%) respondents in Area 3 and 39 (16.5%) respondents in Area 4. Finally, in the South Region there were 30 (12.7%) respondents in Area 5 and 27 (11.4%) respondents in Area 6. These findings allow for the conclusions of this study to be generalized to the Georgia Agricultural Education teacher population without concern for a limitation of appropriate area representation.

Table 1

Distribution by Area of Survey Participants Versus Actual Numbers of Georgia Agricultural Education Teachers

Georgia Agricultural Education Region and Area	Respondents	% of Total Respondents	GA Agriculture Teachers by Area	% of Total GA Agriculture Teachers
North Region Area 1	45	19.0	82	17.6
North Region Area 2	50	21.1	98	21.0
Central Region Area 3	46	19.4	84	18.0
Central Region Area 4	39	16.5	67	14.4
South Region Area 5	30	12.7	71	15.2
South Region Area 6	27	11.4	64	13.7
Total	237		466	

The reported community type of respondents' locations is listed in Table 2. The majority (60.8%, N = 144) of respondents classified his/her school's community as rural. Suburban communities made up 29.1% (N = 69) of respondents' locations while only 10.1% (N = 24) were located in an urban community.

Table 2

Community Type of Respondents' Schools

Community Type	Respondents	% of Total
Rural	144	60.8
Suburban	69	29.1
Urban	24	10.1

The type of program as defined by number of Agricultural Education teachers in the department, and program level in which respondents taught is listed in Table 3. Just over half (52.3%, N = 124) reported only one teacher while 68 respondents (28.7%) reported having 2 teachers, 33 (13.9%) reported having 3 teachers, 11 (4.6%) reported having 4 teachers and only 1 respondent (0.4%) reported having 5 or more teachers in his/her department. Slightly over half (52.3%, N = 124) of the respondents reported being in a single teacher department while just under half (47.7%, N = 113) reported

being in a multi-teacher department. A little over two-thirds of respondents (68.8%, N = 163) taught exclusively at the high school level. Notably fewer (23.6%, N = 56) taught at the middle school level while only 7.6% (N = 18) taught classes at both the middle and high school levels.

Table 3

Distribution of Type of Programs, Level of Programs and Number of Teachers

Characteristic	Respondents	% of Total
Program Type		
Single Teacher	124	52.3
Multi Teacher	113	47.7
Number of Teachers		
1	124	52.3
2	68	28.7
3	33	13.9
4	11	4.6
5 or more	1	0.4
Program Level		
High School	163	68.8
Middle School	56	23.6
Both Middle and High	18	7.6

Response rates by reported gender are listed in Table 4. The number of male (50.6%, N = 120) respondents was almost equal to female (49.4%, N = 117) respondents. A comparison to total Georgia agriculture teacher numbers (Georgia Agricultural Education, 2016) show a slightly higher number of males (56.2%, N = 262) than females (43.8%, N = 204).

Table 4

Gender of Respondents Versus Actual Gender Ratios of Georgia Agricultural Education Teachers

Gender	Respondents	% of Total Respondents	GA Agriculture Teachers	% of Total GA Agriculture Teachers
Male	120	50.6	262	56.2
Female	117	49.4	204	43.8
Total	237		466	

Data on the reported age of survey respondents are listed in Table 5. Almost one-third of respondents were in the "30 years' or less" age range while another one-third were in the "31-40" (both 32.1%, N = 76) age range. Fewer respondents were in the "41-50" age range (19.4%, N = 46) and "51 or older" (16.5%, N = 39). The average reported age of respondents was 37.5 years of age with a minimum age of 21 and a maximum age of 67 years of age. It is worth noting that survey respondents' age representation was almost evenly distributed between "30 years or less," "31 to 40" years of age and over 40 years of age.

Table 5

Age of Respondents

Age ranges	Respondents	% of Total Respondents	M	SD
30 or less	76	32.1		
31-40	76	32.1		
41-50	46	19.4		
51 or older	39	16.5		
Total			37.5	10.966

Participants were asked to report their years of teaching experience in both the agricultural field and in any educational field. Respondents' years of experience ranged from 0 years to 38 years in both Agricultural Education and all fields of education. The average years of experience for teaching Agricultural Education was 10.3 while the

average for all fields was slightly higher at 11.9. A summary of these data is listed in Table 6. Data were grouped into the following four main categories of experience: "5 years or less," "6 to 10 years," "11 to 20 years" and "21 plus years." In the Agricultural Education field, the reported percentage of teachers with "5 years or less" experience was 38.4% (N = 91) while in contrast their total teaching experience was 31.2% (N = 74). The "11 to 20 years" of experience was reported by 26.6% (N = 63) of respondents in the Agricultural Education field and 32.9% (N = 78) of all educational fields. Next, 20.7% of respondents (N = 49) reported "6 to 10 years" of experience in Agricultural Education while 19.0% (N = 45) reported the same experience in all fields. Finally, the "21 plus years" category was reported by 14.3% (N = 34) in the Agricultural Education field and 16.9% (N = 40) for all educational fields. A point of note is that 52 (21.9%) of respondents taught another subject before teaching Agricultural Education.

Table 6

Reported Years of Experience

Characteristic	Respondents	% of Total Respondents	M	SD
Years Experience in Agricultural Education				
5 years or less	91	38.4		
11 to 20 years	63	26.6		
6 to 10 years	49	20.7		
21 plus years	34	14.3		
Total			10.3	8.785
Years Experience in all fields				
11 to 20 years	78	32.9		
5 years or less	74	31.2		
6 to 10 years	45	19.0		
21 plus years	40	16.9		
Total			11.9	9.079

Table 7 lists the reported highest degree earned by respondents and the method of certification. Nearly equal are the number of respondents who had a bachelor's degree

(38.0%, N = 90) and those that had a Master's degree (36.3%, N = 86). Almost one-fifth of respondents (19.8%, N = 47) reported possessing a specialist's degree and a very small percentage (5.9%, N = 14) reported possessing a doctoral degree. The most common certification method for respondents by far was traditional teacher certification programs (72.2%, N = 171). Much less common were an alternative certification method (23.6%, N = 56). Respondents that were certified through their graduate degree were the smallest group at 4.2% (N = 10).

Table 7

Highest Degree Earned and Method of Certification

Degree	Respondents	% of Total
Bachelor's Degree	90	38.0
Master's Degree	86	36.3
Specialist's Degree	47	19.8
Doctoral Degree	14	5.9
Certification Method		
Traditional Baccalaureate Teacher certification program	171	72.2
Alternatively Certified	56	23.6
Graduate School Certified	10	4.2

Respondents were then asked to select the Agricultural Education courses they taught. Results of these selections are listed in Table 8. Of the respondents, 229 (96.6% chose more than one Agricultural Education course. Only 8 (3.4%) of respondents chose one Agricultural Education course. The most frequent response was Basic Agricultural Science with 71.7% (N = 170) of respondents reporting teaching this course. Approximately one-third of respondents reported teaching General Horticulture and Plant Science (35.4%, N = 84) and Animal Science and Biotechnology (31.6%, N = 75). Middle School courses were reportedly taught by approximately one-fourth of respondents with 25.7% (N = 61) teaching 8th grade, 24.1% (N = 57) teaching 7th grade and 22.8% (N = 54) teaching 6th grade. Agricultural Mechanics Technology I was

reportedly taught by 24.5% (N = 58) of respondents while 22.8% (N = 54) reported teaching Forest Science. Next was Nursery and Landscape reportedly taught by 20.3% (N = 48) of respondents, Agricultural Mechanics Technology II reported by 19.4% (N = 46) and Wildlife Management reportedly taught by 15.2% (N = 36). Agricultural Animal Production and Management was reported by 13.5% (N = 32), while Agribusiness Management and Leadership was reported by 11.0% (N = 26) of respondents and Plants Science and Biotechnology was reportedly taught by 10.5% (N = 25) of respondents. Only 8.4 % (N = 20) reported teaching Veterinary Science. Both Agricultural Metals Fabrication and Floral Design and Management were reportedly taught by 6.3% (N = 15) of respondents. Only 12 respondents (5.1%) reported teaching Floriculture Production and Management while 10 (4.2%) reported teaching Forestry Science II. There were 5 (2.1%) respondents that reported teaching Small Animal Care. Equine Science and Natural Resources Management were only reported by 1.7% (N = 4) of respondents. Three respondents (1.3%) reported teaching Agriculture Electricity and Electric Controls and Aquaculture. Two respondents (0.8%) reportedly taught Environmental Science and Stewardship and Marketing Agriculture Products and Services. There was one response each (0.4%) for both Sustainable Agriculture and Turf Production and Management. None of the respondents reported teaching Agricultural and Food Products Processing, Agriculture Meat and Dairy Product Processing, Introduction to Renewable Energy, or Renewable Fuel Production. Even though three-fourths of Agricultural Education teachers surveyed taught Basic Agricultural Science and another course, there was a wide variety of Agricultural Education courses taught by survey respondents.

Table 8

Courses Taught

Course	Respondents*	% of Respondents
Basic Agricultural Science	170	71.7
General Horticulture and Plant Science	84	35.4
Animal Science and Biotechnology	75	31.6
Middle School 8th Grade	61	25.7
Agricultural Mechanics Technology I	58	24.5
Middle School 7th Grade	57	24.1
Forest Science	54	22.8
Middle School 6th Grade	54	22.8
Nursery and Landscape	48	20.3
Agricultural Mechanics Technology II	46	19.4
Wildlife Management	36	15.2
Agricultural Animal Production and Management	32	13.5
Agribusiness Management and Leadership	26	11.0
Plant Science and Biotechnology	25	10.5
Veterinary Science	20	8.4
Agricultural Metals Fabrication	15	6.3
Floral Design and Management	15	6.3
Floriculture Production and Management	12	5.1
Forestry Science II	10	4.2
Small Animal Care	5	2.1
Equine Science	4	1.7
Natural Resources Management	4	1.7
Agriculture Electricity and Electric Controls	3	1.3
Aquaculture	3	1.3
Environmental Science and Stewardship	2	0.8
Marketing Agriculture Products and Services	2	0.8
Sustainable Agriculture	1	0.4
Turf Production and Management	1	0.4
Agricultural and Food Products Processing	0	0.0
Agriculture Meat and Dairy Product Processing	0	0.0
Introduction to Renewable Energy	0	0
Renewable Fuel Production	0	0

*Most respondents (96.6%, N = 229) chose more than one course.

Summary of Demographic Findings

In summary, the data revealed the geographic spread of survey respondents accurately compared to the actual distribution of Georgia Agricultural Education teachers. Additionally, the majority of respondents classified themselves as teaching in a

rural community with almost two-thirds teaching at the high school level and approximately one-third at the middle school level. Furthermore, respondents were almost evenly distributed between male and female, had an average age of 37.5 and had an average teaching experience of 11.9 years. Finally, the most common Agricultural Education course taught was Basic Agricultural Science.

Extent of the Use of Internet-enhanced Instruction

Research Question 1: What is the reported extent of the use of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participated in the study?

To address Research Question One, participants were asked how many hours per week their students used the Internet for instructional purposes. For the data analyses of these results, respondents who reportedly used the Internet 0 hours (N = 6) and those that reportedly had students use the Internet more than 10 hours per week (N = 4) were excluded as outliers. Therefore, 227 respondents were included in analysis of the extent of the use of Internet-enhanced instruction. These results are listed in Table 9. The results were almost evenly distributed among the three ranges. The number of respondents who reported using the Internet 1 hour or less (34.8 %, N = 79) was exactly the same number (34.8%, N = 79) as those reporting using the Internet 2 hours per week. Those reporting using the Internet for 3-10 hours per week for instructional purposes was 30.4% (N = 69). Even though 10 outliers were omitted from this data set, these data show that the Internet is being used by 97.5% (N = 231) of Georgia Agricultural Education teachers who responded to the survey. The amount of usage varied, yet one-third reportedly used the Internet 1 hour or less per week while almost two-thirds

reportedly used the Internet 2 to 10 hours per week to enhance learning in their classroom.

Table 9

Hours Per Week Students Reportedly Used the Internet for Instructional Purposes*

Range	Respondents	% of Respondents
1 hour or less	79	34.8
2 hours	79	34.8
3 to 10 hours	69	30.4

* Responses of 0 hours (N = 6) and more than 10 hours per week (N = 4) were excluded as outliers.

To further address Research Question One, participants were asked what locations their students used the Internet for activities in their classes. The results are listed in Table 10. Most participants (83.3%, N = 189) chose more than one location for Internet use. The most common response was in the teacher's own classroom (88.1%, N = 200). Respondents reported that students accessed the Internet at home (61.2%, N = 139) and wirelessly (57.7%, N = 131) with these two almost equal in the number of responses. The fourth most common location was in a computer lab (48.0%, N = 109) while in the school's media center was selected less often (37.0%, N = 84). Very few respondents (5.7%, N = 13) reported other locations. Other locations reported were: Chromebooks, student-brought cell phones, personal devices and school-issued iPads and laptops, which are not really locations but types of devices. The data show that the vast majority of Internet-enhanced instruction (88.1%) takes place in the Agricultural Education teacher's own classroom.

Table 10

Location of Internet Use*

Location	Respondents**	Chosen by % of Respondents
In the teacher's classroom	200	88.1
At home	139	61.2
Wirelessly	131	57.7
Computer Lab	109	48.0
School media center	84	37.0
Other	13	5.7

* Responses of using Internet 0 hours per week (N = 6) and more than 10 hours per week (N = 4) were excluded as outliers.
**Most respondents (83.3%, N = 189) chose more than one location.

Additionally, participants were asked to select the Learning Management System(S) (LMS) they used. These results are listed in Table 11. Almost half of the respondents (48.5%, N = 110) reported using Google Classroom as the LMS for their classes. Using no LMS was reported by 34.8% (N = 79) of respondents. Other Learning Management Systems were reported by 15.0% (N = 34). The other LMS' listed in the comments were: "ItsLearning (N = 3)," "AET (N = 4)," "Livebinders (N = 1)," "Edmodo (N = 2)," "Canvas (N = 8)," "Desire2Learn (N = 1)," "Schoology (N = 4)," "Edulastic (N = 1)," and school websites. Participants also listed some Internet-enhanced websites such as "Remind" and "Kahoot!" as well as technology such as "Smartboard," "Promethean board," "whiteboard," and an "LCD projector," none of which are Learning Management Systems. Few (7.9%, N = 18) reported using the Blackboard LMS while only 6 respondents (2.6%) reported using Moodle as their LMS. Only a few (8.3%, N = 19) listed more than one LMS, but by far the most common Learning Management System teachers reported using was Google Classroom.

Table 11

Learning Management Systems (LMS) Reported*

LMS	Respondents**	% of Total
Google Classroom	110	48.5
None	79	34.8
Other	34	15.0
Blackboard	18	7.9
Moodle	6	2.6

* Responses of using Internet 0 hours per week (N = 6) and more than 10 hours per week (N = 4) were excluded as outliers.
** 19 respondents (8.3%) chose more than one LMS.

To further answer Research Question One, participants were asked how many Internet-connected, student devices each respondent had in his or her classroom. These results are listed in Table 12. Participants who reported 1 to 14 Internet-connected devices numbered 90 (39.6%). Respondents who had an Internet-connected device for each student in the classroom or whose school provided every student with an Internet-connected device (1:1 school) numbered 73 (32.2%). Those reporting 15 to 27 devices were 33 (14.5%) while those reporting no Internet-connected student devices in the classroom numbered 31 (13.7%).

The types of Internet-connected devices participants reported that students used in their classrooms are also listed in Table 12. Two-thirds of the participants (66.5%, N = 151) chose more than one type of Internet-connected device. The most common response was a Windows Desktop Personal Computer (67.0%, N = 152). The next two highest responses were student-brought, smart phones with 106 (46.7%) responses and Chromebooks with 102 (44.9%) responses. The fourth most common Internet-connected device was a Windows Laptop Personal Computer with 80 (35.2%) responses. iPads were reportedly used by 15.0% (N = 34) of respondents and Apple laptops were reported by 5.7% (N = 13) of respondents. Both Windows Tablets and Apple Desktop computers

were reported by 3.0% (N = 7) respondents while Android Tablets were reported by 2.6% (N = 6) respondents. Very few respondents (2.2%, N = 5) reported other Internet-connected devices. Other Internet-connected devices reported were: Toughbooks, which are Windows laptop personal computers, and student-brought iPads. The least reported Internet-connected device was an iPod with 2 respondents (0.9%).

Table 12

Internet-connected Devices Available in Classroom and Types of Devices*

Number of Devices	Respondents	% of Respondents
1-14	90	39.6
Every student has a connected device	73	32.2
15-27	33	14.5
No devices	31	13.7
Types of Devices	**Respondents****	**% of Respondents****
Windows PC (Desktop)	152	67.0
Student-brought Smart Phones	106	46.7
Chromebook	102	44.9
Windows PC (Laptop)	80	35.2
iPad	34	15.0
Apple Laptop	13	5.7
Windows Tablet	7	3.0
Apple Desktop	7	3.0
Android Tablet	6	2.6
Other	5	2.2
iPod	2	0.9

* Responses of using Internet 0 hours per week (N = 6) and more than 10 hours per week (N = 4) were excluded as outliers.
** 151 respondents (66.5%) chose more than one Internet-connected device.

In summary, 97.5% of respondents used the Internet to enhance learning to some extent and most of the time they used it in their own classrooms. The majority of respondents used Google Classroom as their Learning Management System. The most common Internet-connected device reported was a Windows desktop and 86.3% of respondents had at least one Internet-connected device in their classrooms.

Current Uses of Internet-enhanced Instructional Strategies

Research Question 2: What are the current uses of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participated in the study?

To address Research Question 2, participants were asked to rate the degree of use of the Internet for specific purposes in their classroom on a Likert scale with: 1 = Not at All, 2 = Small Extent, 3 = Moderate Extent, 4 = Great Extent and 5 = Entirely. The Internet uses that participants were asked to rate included: "small group instruction," "individual instruction," "as a reward," "independent learning, "to tutor," "to promote student-centered learning," "as a research tool for students," "to administer tests and quizzes," "as a communication tool," "as a classroom presentation tool," "contest preparations," "to archive presentations and forms" and "record keeping instruction." The means and standard deviations are listed in Table 13. The results show the highest rated use of the Internet was "As a research tool for students," with a mean score of 3.78. Other high rated uses were "As a classroom presentation tool" (3.68), "Contest preparation" (3.59) and "As a communication tool" and "Record keeping instruction" both with a mean score of 3.56, "To archive presentations and forms" (3.39), "Independent learning (3.22) and "Individual instruction" with a mean score of 3.16. The lowest rated use of the Internet was "As a reward," with a mean score of 1.91. The results show that 9 of the 13 items (Internet Uses) had a mean score greater than 3. This suggests that Agricultural Education teachers who completed the survey are using the Internet in a variety of ways to enhance instruction. Additionally, the three items, "Small group instruction" (2.80), "To tutor" (2.44) and "To administer tests and quizzes" (2.37)

that were rated below 3 are potential areas for professional development. Ten of these 13 uses can be divided into the dichotomous categories of teacher-focused lessons ("as a classroom presentation tool", "individual instruction", "small group instruction", "to tutor", and "as a communication tool") and student focused lessons ("as a research tool for students", "record keeping", "to archive presentations or forms", "independent learning", and "to promote student-centered learning", and "as a reward". The Internet uses "to administer tests and quizzes", "record keeping instruction", and "contest (CDE) preparation" were not included in these categories.

Table 13

Using the Internet in the Classroom

Internet Use	Mean	Standard Deviation
As a research tool for students	3.78	0.693
As a classroom presentation tool	3.68	0.750
Contest (Career Development Event) preparation	3.59	0.743
As a communication tool (e.g. e-mail, electronic discussion, FFA promotion)	3.56	0.973
Record keeping (Supervised Agricultural Experience) instruction	3.56	1.133
To archive presentations or forms	3.39	0.959
Independent learning	3.22	0.856
To promote student-centered learning	3.19	0.859
Individual instruction	3.16	0.795
Small group instruction	2.80	0.811
To tutor	2.44	1.051
To administer tests and quizzes	2.37	1.153
As a reward	1.91	1.018

Participants' comments revealed other ways in which they used the Internet to enhance learning. These included several comments about using Google Classroom for uses such as: "digital journals," bell ringer or "warm up" questions and answer summaries. Additional comments revealed uses such as "review games," videos ("YouTube" and "educational videos"), "enrichment," "Project Based learning," "for

visual learners," and "to teach students how to find the answers to their own questions."

Factors that Encourage or Discourage Internet-enhanced Instructional Strategies

Research Question 3: What are the demographic and perceived intrinsic and extrinsic factors and variables that encourage the use of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participated in the study?

Research Question 4: What are the demographic and perceived inhibiting factors and variables that discourage the use of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participated in the study?

Demographic Factors

To address the demographic portion of Research Questions Three and Four, responses for Internet use were separated by demographical characteristics including: gender, age, years of experience, community type, program level, highest degree and certification method in order to see if there were any differences among the means of Internet usage.

Responses by gender are listed in Table 14. Overall there is very little difference in Internet usage types based on gender. However, females had higher mean ratings for the Internet uses of "As a communication tool" with females rating this usage with a mean score of 3.78 and males with a mean score of 3.35, "As a classroom presentation tool" where the female mean rating was 3.77 while males had a mean rating of 3.60, "Record keeping" with a mean rating of 3.67 for females and 3.44 for males, "To promote student-centered learning" where females had a mean rating of 3.32 and males had a mean rating of 3.06 and "To administer tests and quizzes" with females rating this

usage with a mean score of 2.46 and males with a mean score of 2.27. Male respondents had a slightly higher mean rating for the Internet usages of "Independent learning" where the mean for males was 3.24 and females 3.21, "Individual instruction" where the mean for males was 3.19 and females 3.13, "To tutor" where the mean for males was 2.49 and females 2.38 and "As a reward" where the mean for males was 1.93 and females 1.89.

Table 14

Internet Uses in the Classroom by Gender

Internet Use	Male	Female
As a research tool for students	3.79	3.78
As a classroom presentation tool	3.60	3.77
Contest (Career Development Event) preparation	3.59	3.59
Record keeping (Supervised Agricultural Experience) instruction	3.44	3.67
As a communication tool (e.g. e-mail, electronic discussion, FFA promotion)	3.35	3.78
To archive presentations or forms	3.35	3.42
Independent learning	3.24	3.21
Individual instruction	3.19	3.13
To promote student-centered learning	3.06	3.32
Small group instruction	2.80	2.80
To tutor	2.49	2.38
To administer tests and quizzes	2.27	2.46
As a reward	1.93	1.89

Responses for Internet use were also broken down by age into 4 categories including: 30 or less years of age, 31 to 40 years of age, 41 to 50 years of age and over 51 years of age. These results are listed in Table 15. Results show that a trend exists that ratings decrease with age. These results suggest that the usage of Internet-enhanced instruction decreases as age increases. Exceptions to this are the use of the Internet: "To tutor," and "Record keeping instruction," both of which actually increased with age from the "30 or less" age group to the "51 or older" age group. However, although ratings trended down between the youngest and oldest age groups, ratings were either the same

or slightly higher in the “41-50” than the “31-40” years of age groups in all uses, except the “Individual instruction” and “Independent learning.”

Table 15

Internet Uses in the Classroom by Age

Internet Use	30 or less	31-40	41-50	51 or older
As a research tool for students	3.78	3.79	3.93	3.61
As a communication tool (e.g. e-mail, electronic discussion, FFA promotion)	3.78	3.49	3.64	3.18
As a classroom presentation tool	3.74	3.67	3.67	3.61
Contest (Career Development Event) preparation	3.65	3.58	3.64	3.45
Record keeping (Supervised Agricultural Experience) instruction	3.47	3.62	3.62	3.53
To archive presentations or forms	3.46	3.36	3.43	3.26
To promote student-centered learning	3.32	3.10	3.29	3.00
Independent learning	3.31	3.22	3.12	3.18
Individual instruction	3.27	3.16	3.05	3.08
Small group instruction	2.88	2.81	2.90	2.50
To administer tests and quizzes	2.45	2.23	2.50	2.32
To tutor	2.24	2.45	2.62	2.58
As a reward	2.07	1.85	1.86	1.79

Responses for Internet use were additionally analyzed by years of experience into 4 categories including: 5 years or less, 6-10 years, 11-20 years and 21 or more years of experience. These results are listed in Table 16. The results were very similar to the age group breakdowns in Table 15. Again, the results suggest that there is less Internet-enhanced instruction among participants with greater years of experience than with those with fewer years of experience. Additionally, similar to results in Table 15, although ratings trended down between the lowest and highest numbers of years teaching, ratings were either the same or slightly higher in the “11-20” than the “6-10” years of experience groups in all uses, except the “Small group instruction,” “Independent learning,” “To promote student-centered learning” and “As a research tool for students” categories.

Table 16

Internet Uses in the Classroom by Years of Experience

Internet Use	5 or less	6-10	11-20	21 or more
As a research tool for students	3.81	3.83	3.77	3.72
As a classroom presentation tool	3.74	3.62	3.71	3.58
As a communication tool (e.g. e-mail, electronic discussion, FFA promotion)	3.72	3.62	3.52	3.28
Contest (Career Development Event) preparation	3.68	3.48	3.57	3.58
Record keeping (Supervised Agricultural Experience) instruction	3.53	3.60	3.60	3.47
To archive presentations or forms	3.47	3.26	3.42	3.31
Independent learning	3.40	3.14	3.12	3.19
Individual instruction	3.35	3.07	3.09	3.06
To promote student-centered learning	3.31	3.14	3.13	3.14
Small group instruction	2.92	2.83	2.74	2.64
To administer tests and quizzes	2.43	2.07	2.45	2.39
To tutor	2.25	2.31	2.53	2.75
As a reward	2.08	1.81	1.84	1.83

Additionally, responses for Internet use were analyzed by community type into 3 categories including: urban, suburban and rural. These results are listed in Table 17. The results revealed that there is very little difference in Internet use based on community type with the exception that respondents in urban areas may be more likely to use the Internet to administer tests and quizzes, for record keeping and as a communication tool.

Table 17

Internet Uses in the Classroom by Community Type

Internet Use	Urban	Suburban	Rural
As a communication tool (e.g. e-mail, electronic discussion, FFA promotion)	4.13	3.56	3.47
Record keeping (Supervised Agricultural Experience) instruction	4.00	3.67	3.42
As a research tool for students	3.83	3.74	3.80
As a classroom presentation tool	3.83	3.74	3.63
To archive presentations or forms	3.79	3.35	3.34
Contest (Career Development Event) preparation	3.63	3.45	3.65
To promote student-centered learning	3.38	3.30	3.10
Individual instruction	3.21	3.24	3.12
Independent learning	3.17	3.30	3.20
Small group instruction	2.96	2.76	2.79
To administer tests and quizzes	2.83	2.24	2.34
To tutor	2.71	2.32	2.45
As a reward	1.83	1.67	2.04

Responses for Internet use were also analyzed by program level, or where the respondent taught, into 3 categories including: middle school, high school and both middle and high school. These results are listed in Table 18. Overall, there was very little difference in ratings between the different program levels. However, these findings suggest that using the Internet as a reward was more likely to occur at the middle school level than at the high school level.

Table 18

Internet Uses in the Classroom by Program Level

Internet Use	Middle School	High School	Both Middle & High School
As a research tool for students	3.80	3.81	3.47
As a communication tool (e.g. e-mail, electronic discussion, FFA promotion)	3.72	3.53	3.41
Contest (Career Development Event) preparation	3.63	3.58	3.53
As a classroom presentation tool	3.57	3.74	3.47
To archive presentations or forms	3.44	3.40	3.06
Record keeping (Supervised Agricultural Experience) instruction	3.43	3.61	3.47
To promote student-centered learning	3.26	3.21	2.76
Individual instruction	3.22	3.17	2.88
Independent learning	3.15	3.26	3.18
Small group instruction	2.78	2.81	2.76
To administer tests and quizzes	2.48	2.31	2.47
As a reward	2.26	1.75	2.29
To tutor	2.13	2.56	2.29

Responses for Internet use were also analyzed by highest degree with 4 categories including: Bachelor's, Master's, Specialist's and Doctorate. These results are listed in Table 19. There was very little difference in the mean ratings among the four degree levels. The results suggest that Internet-enhanced instruction may not be dependent on the highest degree earned by respondents.

Table 19

Internet Uses in the Classroom by Highest Degree

Internet Use	Bachelor's	Master's	Specialist's	Doctorate
As a research tool for students	3.74	3.84	3.76	3.86
As a communication tool (e.g. e-mail, electronic discussion, FFA promotion)	3.69	3.49	3.67	2.86
As a classroom presentation tool	3.63	3.78	3.69	3.50
Contest (Career Development Event) preparation	3.60	3.56	3.64	3.50
Record keeping (Supervised Agricultural Experience) instruction	3.50	3.63	3.67	3.14
Independent learning	3.26	3.16	3.20	3.43
To archive presentations or forms	3.25	3.59	3.40	3.07
To promote student-centered learning	3.17	3.16	3.29	3.14
Individual instruction	3.16	3.15	3.18	3.21
Small group instruction	2.73	2.94	2.76	2.57
To tutor	2.36	2.38	2.56	2.86
To administer tests and quizzes	2.32	2.40	2.47	2.14
As a reward	2.08	1.71	1.98	1.79

Responses for Internet use were additionally analyzed by certification type with 3 categories including: traditional, alternative and graduate certification. These results are listed in Table 20. There was very little difference in the mean ratings among the three certification types. The results suggest that Internet-enhanced instruction may not be dependent on the method of certification of participants.

Table 20

Internet Uses in the Classroom by Certification Type

Internet Use	Traditional	Alternative	Graduate
As a research tool for students	3.79	3.82	3.78
As a classroom presentation tool	3.64	3.78	3.68
Contest (Career Development Event) preparation	3.59	3.56	3.59
Record keeping (Supervised Agricultural Experience) instruction	3.54	3.51	3.56
As a communication tool (e.g. e-mail, electronic discussion, FFA promotion)	3.53	3.67	3.56
To archive presentations or forms	3.33	3.45	3.39
Independent learning	3.23	3.15	3.22
Individual instruction	3.18	3.07	3.16
To promote student-centered learning	3.17	3.24	3.19
Small group instruction	2.77	2.84	2.80
To tutor	2.42	2.42	2.44
To administer tests and quizzes	2.36	2.31	2.37
As a reward	1.98	1.76	1.91

Findings for Internet use strategies across the demographical characteristics of gender, age, years of experience, community type, program level, highest degree and certification method revealed several uses that were consistently rated high as well as some that were consistently rated low. Respondents across all demographics rated using the Internet "As a research tool for students", "As a classroom presentation tool", "Contest (Career Development Event) preparation", "Record keeping (Supervised Agricultural Experience) instruction" and "As a communication tool (e.g. e-mail, electronic discussion, FFA promotion)" 3.50 or above. This suggests that these five Internet uses are the most consistent strategies Agricultural Education teachers are implementing to enhance learning in the classroom. In contrast, respondents consistently rated the Internet uses of "Small group instruction", "To tutor", "To administer tests and quizzes" and "As a reward" below 3.00. These findings suggest that professional development may be need for these 4 Internet uses.

To address the extrinsic factors and variables portions of research questions 3 and 4 that encourage or discourage Internet-enhanced instruction, participants were asked to rate on a Likert scale to what extent they were prepared for Internet use with: 1 = Not at All, 2 = Small Extent, 3 = Moderate Extent, 4 = Great Extent and 5 = Entirely. Preparation types that participants were asked to rate included: "As part of your undergraduate work," "In-service or professional development courses/Workshops," "Independent Learning," "Interaction with other faculty/staff," "Interaction with other agriculture teachers," "Distant learning courses" and "From my students." The means and standard deviations are listed in Table 21. The results show that the highest rated source of skill acquirement for using the Internet to enhance the classroom came from respondents' "Independent Learning" with a mean score of 3.21. Close behind this source was "Interaction with other faculty/staff" with a mean score of 3.14. Conversely, the lowest mean score was 2.06 for the source of "Distance Learning courses" suggesting that this was used to a very small extent as a source for learning how to use the Internet to enhance classroom instruction. Other sources averaged between small extent and moderate extent and included: "As part of your undergraduate work" (2.56), "From my students" (2.67), "Interaction with other agriculture teachers" (2.70) and "In-service or professional development courses/Workshops" (2.71).

Table 21

Teacher Preparation and Professional Development for Internet Use

Statement Concerning Source of Internet Skills	Mean	Standard Deviation
Independent Learning (e.g. online tutorials or books)	3.21	1.042
Interaction with other faculty/staff	3.14	0.849
In-service or professional development courses/Workshops	2.71	0.894
Interaction with other agriculture teachers	2.70	0.968
From my students	2.67	0.917
As part of your undergraduate work	2.56	1.133
Distant Learning courses	2.06	1.218

Additionally, respondents were asked to comment on other sources of teacher preparation or professional development in a comments question. None of the responses included comments relating to teacher preparation. Instead all the comments revealed different types of professional development. These comments were coded into six categories of sources of professional development including: professional associations, professional development courses, graduate coursework, school system professional development, other individuals, and independent learning. Georgia Agriculture Education teachers have two main professional associations available to them, which include the Georgia Vocational Agricultural Teachers Association (GVATA), which is the Georgia affiliate of the National Association of Agricultural Educators (NAAE), and the Georgia Association of Career and Technical Educators (GACTE), which is the Georgia affiliate of the Association of Career and Technical Educators (ACTE). According to comments such as "GACTE," "GVATA conferences" and "Breakout Sessions at Mid-Winter and Summer Teachers Conferences," respondents learned how to use the Internet to enhance learning at breakout sessions at the conferences of these two associations. Additionally, there were numerous comments regarding learning how to use the Internet to enhance learning in professional development workshops conducted

outside of their own school system. Most of these comments such as "CTAERN Courses," "Ctaern" and "CTAERN" referenced workshops conducted by the Career, Technical and Agricultural Education Resource Network (CTAERN), yet one listed the "Ron Clark Academy" and one listed the "Google Educator Level 1 certification." The third category of professional development in using the Internet was coursework respondents took in the pursuit of graduate degrees identified by comments such as "Graduate School," "Master's Degree in Instructional Technology" and "Doctoral program". A fourth category was professional development provided by the respondents' own school systems. Some mentioned individual school system employees who helped respondents in a one-on-one fashion by stating "She held special workshops and then came to you to work on projects and assist wherever she could." Other responses mentioned annual, monthly or weekly staff development trainings on using the Internet by comments such as "County PLU classes and weekly hints sent out on Fridays on how to use programs" and "school system provides ongoing PL oppotunities (sic) for using and integrating technology." A fifth category was simply learning from other individuals who are knowledgeable about how to enhance learning with the Internet including fellow teachers ("New and upcoming teachers"), state Agricultural Education staff members ("Stat (sic) Staff"), or industry personnel ("Industry people"). The final category was independent learning such as learning from YouTube or other online videos ("youtube (sic) tutorial"), written materials ("written material"), or through their own experiences of what works and does not work in their classroom ("Trial and error in the classroom").

To further address the extrinsic factors and variables that encourage or discourage Internet-enhanced instruction, participants were asked to rate the support they received

from their local systems on a Likert scale with: 1=Strongly disagree, 2=Somewhat disagree, 3=Neither agree nor disagree, 4=Somewhat agree, and 5=Strongly agree. The means and standard deviations are listed in Table 22. All statements had a mean rating above "Neither agree nor disagree" (3). The highest rated statement was "I have technical support staff knowledgeable of Internet at my school" with a mean rating of 4.21. Other statements rating above "Somewhat Agree" (4) include: "The administration actively encourages teachers to use the Internet in the classroom" (4.17), "I have access to a computer lab with Internet capabilities" (4.15), "The technical support staff at my school adequately assists me in problem solving and troubleshooting" (4.10), "I work with colleagues who use the Internet in their classrooms" (4.07) and "The administration supports Internet-related training for teachers" (4.03). The data suggest that overall respondents' school systems provided support for using the Internet to enhance instruction.

Statements rating below "Somewhat Agree" (4.00) were: "I have sufficient equipment needed in my classroom to access the Internet" (3.51), "My school district has an ongoing plan for staff development to help teachers use the Internet in their classrooms" (3.55), "I have sufficient, reliable Internet access in my classroom" (3.72), "At my school, teachers share ideas about how to use the Internet in the classroom" (3.73), and "I receive a sufficient level of Internet-related support at my school" (3.86). The data suggest that respondents neither agree nor disagree with having sufficient Internet-equipped devices, district technology plans and teacher collaboration. Therefore, there appears to be room for improvement in these areas. The lowest rated statement was "At my school, teachers have time to learn how to use the Internet in the classroom" with

a mean rating of 3.22. These findings suggest that teachers may have less time than they need in order to learn how to use the Internet in their classrooms.

Table 22

General School Support

Statement	Mean	Standard Deviation
I have technical support staff knowledgeable of the Internet at my school.	4.21	0.839
The administration actively encourages teachers to use the Internet in the classroom.	4.17	0.853
I have access to a computer lab with Internet capabilities.	4.15	0.968
The technical support staff at my school adequately assists me in problem solving and trouble shooting.	4.10	0.833
I work with colleagues who use the Internet in their classrooms.	4.07	0.787
The administration supports Internet-related training for teachers.	4.03	0.867
I receive a sufficient level of Internet-related support at my school.	3.86	0.925
At my school, teachers share ideas about how to use the Internet in the classroom.	3.73	0.874
I have sufficient, reliable Internet access in my classroom.	3.72	1.143
My school district has an ongoing plan for staff development to help teachers use the Internet in their classrooms.	3.55	1.098
I have sufficient equipment needed in my classroom to access the Internet.	3.51	1.267
At my school, teachers have time to learn how to use the Internet in the classroom.	3.22	1.048

Intrinsic Factors and Variables

To address the intrinsic factors and variables portions of research questions 3 and 4 that encourage or discourage Internet-enhanced instruction, participants were asked to rate on a Likert scale to what extent they have confidence and comfort using the Internet with: 1 = Strongly disagree, 2 = Somewhat disagree, 3 = Neither agree nor disagree, 4 = Somewhat agree, and 5 = Strongly agree. The results are listed in Table 23. Most of the statements had a mean rating of slightly less than or over 4 including: “I am comfortable navigating the Internet” (4.49), “I am comfortable using the Internet during my classroom

instruction" (4.33), "I am confident that I can find answers to my students' Internet-related questions" (4.31), "Incorporating the Internet into lessons enhances my teaching" (4.10), "I am comfortable giving Internet assignments to my students" (4.09), "I use the Internet effectively in my classroom" (3.98), "I am developing my expertise on how to use the Internet in the classroom" (3.98) and "My use of the Internet enhances my students' performance" (3.96). The lowest rated statement was "I have had adequate training in using the Internet in my classroom" with a mean rating of 3.74. Overall, these results suggest that respondents have a great deal of confidence in using the Internet.

Table 23

Confidence and Comfort Using the Internet

Statement	Mean	Standard Deviation
I am comfortable navigating the Internet.	4.49	0.674
I am comfortable using the Internet during my classroom instruction.	4.33	0.728
I am confident that I can find answers to my students' Internet-related questions.	4.31	0.748
Incorporating the Internet into lessons enhances my teaching.	4.10	0.764
I am comfortable giving Internet assignments to my students.	4.09	0.922
I use the Internet effectively in my classroom.	3.98	0.801
I am developing my expertise on how to use the Internet in the classroom.	3.98	0.781
My use of the Internet enhances my students' performance.	3.96	0.786
I have had adequate training in using the Internet in my classroom.	3.74	1.009

To further address the intrinsic factors and variables that encourage or discourage Internet-enhanced instruction, participants were asked to rate their attitudes towards Internet use on a Likert scale with: 1 = Strongly disagree, 2 = Somewhat disagree, 3 = Neither agree nor disagree, 4 = Somewhat agree, and 5 = Strongly agree. The five statements that were negative ("I feel tense when people start talking about the Internet," "I feel pressure from others to integrate the Internet into my classroom," "I avoid the

Internet whenever possible," "Using the Internet in the classroom is just another fad" and "The Internet diminishes my role as a teacher") in their intention were coded on a Likert scale with 5 = Strongly disagree, 4 = Somewhat disagree, 3 = Neither agree nor disagree, 2 = Somewhat agree, and 1 = Strongly agree. The results are listed in Table 24 (Positive statements) and Table 25 (Negative statements). The only positive statement with a rating above 4 suggests that respondents do believe in the statement "Internet enhances classroom instruction" since it had a rating of 4.06. Statements with a rating less than 4 included: "I would like my students to be able to use the Internet more" (3.87), "The Internet makes my job easier" (3.76), "The Internet should be incorporated into the classroom curriculum" (3.64), "The ability to effectively use the Internet is essential to my students" (3.60), "More training would increase my use of the Internet in the classroom" (3.22) and "Learning how to incorporate the Internet in the classroom requires a great deal of my professional time" with a mean rating of 3.04. These results suggest that respondents' attitudes were fairly positive towards Internet use.

Furthermore, since the ratings were reversed, the resulting mean ratings of the four negative statements "I avoid the Internet whenever possible" (4.41), "Using the Internet in the classroom is just another fad" (4.30), "I feel tense when people start talking about the Internet" (4.29), and "The Internet diminishes my role as a teacher" (4.23) suggest that the attitude of the respondents were strongly positive towards using the Internet to enhance learning in the classroom. The statement "I feel pressure from others to integrate the Internet into my classroom" had a mean rating of 3.34. These results suggest that respondents did feel some pressure to use the Internet in their classroom.

Table 24

Attitudes Toward Internet Use (Positive)

Statement	Mean	Standard Deviation
The Internet enhances classroom instruction.	4.06	0.735
I would like my students to be able to use the Internet more.	3.87	0.901
The Internet makes my job easier.	3.76	0.939
The Internet should be incorporated into the classroom curriculum.	3.64	1.005
The ability to effectively use the Internet is essential to my students.	3.60	1.040
More training would increase my use of the Internet in the classroom.	3.22	1.091
Learning how to incorporate the Internet in the classroom requires a great deal of my professional time.	3.04	1.019

Table 25

Attitudes Toward Internet Use (Negative)

Statement	Mean	Standard Deviation
I avoid the Internet whenever possible.*	4.41	0.928
Using the Internet in the classroom is just another fad.*	4.30	0.967
I feel tense when people start talking about the Internet.*	4.29	1.005
The Internet diminishes my role as a teacher.*	4.23	1.006
I feel pressure from others to integrate the Internet into my classroom.*	3.34	1.288

*Likert scale reversed

Examining the intrinsic and extrinsic factors that affect Internet usage to enhance student learning in respondents' classrooms reveal several findings of note that will be discussed in detail in Chapter 5. Firstly, in the extrinsic area of Teacher Preparation/Professional Development, respondents rated "Independent Learning" and "Interaction with other faculty/staff" higher than the other areas of learning suggesting that these two areas were a major source of learning how to use the Internet in the classroom. Furthermore, the comments on sources of learning revealed six areas of professional development that included professional associations, professional

development courses, graduate coursework, school system professional development, other individuals, and independent learning none of which were from courses taken through teacher preparation. Additionally, the intrinsic factor of "I have had adequate training in using the Internet in my classroom" was the lowest-rated intrinsic factor in the "Confidence and Comfort Using the Internet" section.

Additionally, the lowest rated extrinsic factors in the "General School Support" was "At my school, teachers have time to learn how to use the Internet in the classroom." This combined with the lowest rated intrinsic factor of "Learning how to incorporate the Internet in the classroom requires a great deal of my professional time" suggests that lack of time is an important factor affecting using the Internet to enhance learning in respondents' Agricultural Education classrooms.

Multivariate Analysis of Variance

Finally, to further answer research questions 3 and 4, multiple analyses were required to adequately investigate if age, years of teaching experience, number of hours using the Internet per week, or the number of Internet-connected devices in the respondents' rooms had a significant effect on the perceptions of respondents towards using the Internet to enhance learning in the classroom. These variables were chosen from the other demographic and situational variables for several reasons. Two-thirds of respondents were under 40 years of age and are considered to be millennials (Tapscott, 2009). Research studies have concluded that millennials are often viewed as innovative users of technology and early adopters of new technology (Lei, 2009; Ng, 2011) and these digital natives are now of age and comprise the new generation of early career teachers (Orlando & Attard, 2016). Therefore, the demographics of age and years of

teaching experience were selected for further analysis. Although this study focuses on Agricultural Education teachers, total years teaching was selected instead of years teaching agriculture because 21.9% (N = 52) of respondents taught another subject before teaching Agricultural Education. Therefore, the total years teaching would potentially be a more accurate predictor of Internet usage than simply using years teaching Agricultural Education. The number of hours using the Internet per week was selected to determine if the amount of use was a result of perceptions of respondents towards using the Internet to enhance learning in the classroom. My assumption was that those respondents that use the Internet more in their teaching would have more positive attitudes towards its use. Finally, the number of Internet-connected devices in the respondents' classrooms was selected for investigation because research studies have concluded that access to technology often affects the adoption of that technology (Berge & Muilenburg, 2003; Buabeng-Andoh, 2012; Ertmer, 2005; Franklin, 2007; Wang, 2017).

To reduce a Type I error, a Multiple Analysis of Variance was conducted with the ratings of all 53 Likert-scale statements included as dependent variables. In order to assess the equality of covariance matrices of the dependent variables across groups, Box's M Test was conducted on the data. In all tests, Pillai's Trace was used because Box's M Test yielded a significant p value ($p \leq .001$) that rejected the null hypothesis that the observed covariance matrices of the dependent variables were equal across groups. Additionally, Levene's Test of Equality of Error Variances was used to assess homogeneity of variance of the dependent variables at the different levels of the independent variable. The significance level for Levene's test was not reached for any of

the dependent variables (with 53 dependent variables, $p < .001$). Therefore, the null hypothesis that the variances are equal could not be rejected for any of the MANOVAs.

The findings of the statistical analysis showed that 3 of the 4 independent variables had a significant relationship to classroom Internet usage. The independent variables of age, total years teaching, and number of Internet-connected devices in a respondent's classroom each had a statistically significant effect on survey ratings (See Table 26). Age had a statistically significant effect on ratings, $F (159, 519) = 1.599$, $p < .001$; Pillai's Trace = 0.986, partial $\eta^2 = .329$. Likewise, years teaching had a statistically significant effect on ratings, $F (159, 519) = 1.585$, $p < .001$; Pillai's Trace = 0.981, partial $\eta^2 = .327$. Finally, the number of Internet-connected devices in the respondents' classrooms had a statistically significant overall effect on ratings, $F (159, 519) = 1.395$, $p = .004$; Pillai's Trace = 0.898, partial $\eta^2 = .299$. However, number of hours using the Internet per week had no statistically significant effect on ratings ($p = 0.181$). When a paired MANOVA was run on the two independent variables of age and years teaching, no significant interactions were found ($p = 0.966$). Additionally, when a paired MANOVA was run on the two independent variables of number of Internet devices and hours using the Internet no significant interactions were found ($p = 0.698$). Overall significance was found for age, total years teaching, and number of Internet-connected devices in a respondent's classroom after post hoc analyses were conducted.

Table 26

MANOVA Overall Effects for Years of Age, Experience, Number of Internet-connected Devices, Hours Using the Internet per Week, and Paired IVs

Source	df	F	p	partial η^2
Years of Age	159, 519	1.599	< .001	.329
Years of Teaching Experience	159, 519	1.585	< .001	.327
Number of Internet-connected Devices	159, 519	1.395	0.004	.299
Number of Hours Using the Internet per Week	106, 346	1.147	0.181	.260
Years of Age and Years of Teaching Experience	318, 1002	0.843	0.966	.211
Number of Internet-connected Devices and Number of Hours Using the Internet per Week	318, 1008	0.952	0.698	.231

In order to conduct post hoc analysis, a Tukey HSD post hoc analysis was applied to identify significant differences on all possible pairwise contrasts. To select the dependent variables for the pairwise contrasts, the acceptable alpha was calculated for each set of questions by dividing the alpha of 0.05 by the number of questions in each category. For each of the three independent variables (age, years of teaching experience, and the number of Internet-connected devices in the respondents' rooms), the acceptable alphas for each section of the survey were: "Teacher Preparation and Professional Development for Internet Use" = 0.007 (0.05/7) resulting in 2 significant questions, "Confidence and Comfort Using the Internet" = 0.006 (0.05/9) resulting in 4 significant questions, "Attitudes Toward Internet Use" = 0.004 (0.05/12) resulting in no significant questions, "Using the Internet in the Classroom" = 0.004 (0.05/13) also resulting in no significant questions, and "General School Support" = 0.004 (0.05/12) resulting in 2 significant questions.

Years of Age

For the independent variable of Years of Age, only two questions were found to have a significant overall alpha. One was from the "Teacher Preparation and Professional Development for Internet Use" section that asked if respondents had acquired skills for using the Internet "As part of your undergraduate work," $\alpha < 0.001$, partial $\eta^2 = 0.216$. Table 27 lists the results of the Tukey HSD post hoc analysis that show that respondents 30 years of age or less were significantly more likely to have acquired Internet skills as part of their undergraduate degrees than all other ages. Additionally, respondents 31-40 were significantly more likely to have acquired Internet skills as part of their undergraduate degrees than 41-50 and 51 or older. There was no significant difference found between respondents 41-50 and 51 or older. Therefore, results show that respondents 40 or less were significantly more likely to have acquired Internet skills as part of their undergraduate degrees than older respondents.

Table 27

Results Obtained from Pairwise Contrasts Using Tukey HSD Test on Significant Years of Age and "As part of your undergraduate work"

				Tukey's HSD Comparisons		
Category	N	Mean	SD	30 or less	31-40	41-50
30 or less	74	3.20	0.876			
31-40	73	2.59	1.039	.002		
41-50	42	2.05	1.103	< .001	.031	
51 or older	38	1.82	1.087	< .001	.001	.735

The second question that was significant based on respondents' ages was from the "Confidence and Comfort Using the Internet" section that asked the degree to which respondents agreed with the statement "I use the Internet effectively in my classroom," $\alpha = 0.003$, partial $\eta^2 = 0.059$. Table 28 lists the results of the Tukey HSD post hoc analysis that show that respondents 40 years of age or less believed they used the Internet more

effectively than those 51 or older but not significantly more than those 41 to 50 years of age.

Table 28

Results Obtained From Pairwise Contrasts Using Tukey HSD Test on Significant Years of Age and "I use the Internet effectively in my classroom"

				Tukey's HSD Comparisons		
Category	N	Mean	SD	30 or less	31-40	41-50
30 or less	74	4.04	0.818			
31-40	73	4.15	0.681	.828		
41-50	42	3.93	0.712	.880	.459	
51 or older	38	3.58	0.948	.018	.002	.192

Years Teaching Experience

For the independent variable of Years of Experience Teaching, 5 questions were found to have a significant overall alpha. The first came from the "Teacher Preparation and Professional Development for Internet Use" section that asked if respondents had acquired skills for using the Internet "As part of your undergraduate work," $\alpha < 0.001$, partial $\eta^2 = 0.164$. Table 29 lists the results of the Tukey HSD post hoc analysis which show that respondents with 5 years or less teaching experience gave a significantly higher rating to having learned how to use the Internet during their undergraduate work than those with 11 or more years of experience. Additionally, results show that respondents with 6-20 years of experience gave a significantly higher rating to having learned how to use the Internet during their undergraduate work than those with 21 or more years of experience.

Table 29

Results Obtained From Pairwise Contrasts Using Tukey HSD Test on Significant Years Teaching Experience and "As part of your undergraduate work"

				Tukey's HSD Comparisons		
Category	N	Mean	SD	0-5	6-10	11-20
0-5	72	3.10	0.995			
6-10	42	2.60	1.127	.066		
11-20	77	2.43	1.044	.001	.839	
21 or more	36	1.72	1.031	< .001	.002	.005

The other 4 questions that were significant based on respondents' years of experience were from the "Confidence and Comfort Using the Internet" section that asked the degree to which respondents agreed with the statements: "I use the Internet effectively in my classroom," $\alpha < 0.001$, partial $\eta^2 = 0.086$, "I am comfortable navigating the Internet," $\alpha < 0.001$, partial $\eta^2 = 0.088$, "I am confident that I can find answers to my students' Internet-related questions," $\alpha = 0.003$, partial $\eta^2 = 0.060$, and "I am developing my expertise on how to use the Internet in the classroom," $\alpha = 0.004$, partial $\eta^2 = 0.058$. Table 30 lists the results of the Tukey HSD post hoc analysis that show that respondents with 20 years or less teaching experience rated their confidence level in using the Internet effectively in their classrooms significantly higher than those with 21 or more years' experience. Additionally, respondents with 20 years or less teaching experience rated their comfort level in navigating the Internet significantly higher than those with 21 or more years' experience. Furthermore, respondents with 20 years or less teaching experience rated their confidence level in their ability to find answers to student Internet-related questions significantly higher than those with 21 or more years' experience. Finally, respondents with 5 years or less teaching experience and those with 11-20 years of experience rated their confidence level in developing their expertise in using the Internet significantly higher than those with 21 or more years' experience.

Table 30

Results Obtained From Pairwise Contrasts Using Tukey HSD Test on Significant Years Teaching Experience and Significant Questions from the "Confidence and Comfort Using the Internet" Section

Question						
I use the Internet effectively in my classroom				Tukey's HSD Comparisons		
Category	N	Mean	SD	0-5	6-10	11-20
0-5	72	4.00	0.822			
6-10	42	4.00	0.826	1.000		
11-20	77	4.18	0.643	.476	.608	
21 or more	36	3.47	0.548	.005	.015	< .001
I am comfortable navigating the Internet						
Category	N	Mean	SD	0-5	6-10	11-20
0-5	72	4.60	0.548			
6-10	42	4.71	0.457	.789		
11-20	77	4.45	0.770	.537	.160	
21 or more	36	4.08	0.732	.001	< .001	.026
I am confident that I can find answers to my students' Internet-related questions						
Category	N	Mean	SD	0-5	6-10	11-20
0-5	72	4.47	0.649			
6-10	42	4.36	0.759	.849		
11-20	77	4.31	0.730	.538	.988	
21 or more	36	3.92	0.841	.001	.042	.039
I am developing my expertise on how to use the Internet in the classroom						
Category	N	Mean	SD	0-5	6-10	11-20
0-5	72	4.15	0.799			
6-10	42	3.95	0.795	.531		
11-20	77	4.03	0.707	.742	.958	
21 or more	36	3.58	0.770	.002	.147	.023

Internet-Connected Devices in the Classroom

For the independent variable of Number of Internet-connected Devices in the Classroom, 2 questions were found to have significant overall alphas that came from the "General School Support" section and asked the degree to which respondents agreed with the statements: "I have sufficient equipment needed in my classroom to access the Internet," $\alpha < 0.001$, partial $\eta^2 = 0.221$, and "I have sufficient reliable Internet access in my classroom," $\alpha < 0.001$, partial $\eta^2 = 0.068$. Table 31 lists the results of the Tukey HSD

post hoc analysis that shows that respondents with no Internet-connected devices in their classroom rated their level of agreement with having sufficient and reliable access to the Internet significantly lower than those with any number of Internet devices in their classrooms. Additionally, respondents who had 28 or more devices or were in a 1:1 school (all students have a device) rated their level of agreement significantly higher than those with fewer devices in regards to the question of having sufficient equipment to access the Internet. Finally, respondents with none or 1-14 devices rated their agreement with having sufficient reliable Internet access in their classroom significantly lower than those with 28 or more devices or who were in a 1:1 school, yet those with 15-27 devices did not rate the same question significantly different than any other group.

Table 31

Results Obtained From Pairwise Contrasts Using Tukey HSD Test on Internet-Connected Devices in the Classroom and Significant Questions from the "General School Support" Section

Question						
I have sufficient equipment needed in my classroom to access the Internet				Tukey's HSD Comparisons		
Category	N	Mean	SD	None	1-14	15-27
None	31	2.45	1.261			
1-14	90	3.29	1.265	.002		
15-27	33	3.45	1.003	.003	.888	
28 + or 1:1 School	73	4.26	0.913	< .001	< .001	.004
I have sufficient reliable Internet access in my classroom				Tukey's HSD Comparisons		
Category	N	Mean	SD	None	1-14	15-27
None	31	3.35	1.427			
1-14	90	3.51	1.084	.906		
15-27	33	3.76	0.867	.471	.696	
28 + or 1:1 School	73	4.12	1.092	.008	.003	.399

In summary, the findings of the statistical analysis showed that the independent variables of age, total years teaching, and number of Internet-connected devices in a respondent's classroom each had a statistically significant effect on survey ratings. In

contrast, significant effects were found on neither the number of hours using the Internet per week nor on the paired factors of age and years teaching as well as number of Internet devices and hours using the Internet per week. Post hoc analyses revealed that respondents 40 or less years of age and those with 5 or less years of experience were significantly more likely to have acquired Internet skills as part of their undergraduate degrees than older respondents and had a significantly higher confidence in using the Internet than older, more experienced teachers. Additionally, respondents with 20 years or less experience rated their confidence using the Internet significantly higher than respondents with 21 or more years of experience. Finally, respondents with 14 or less Internet-connected devices gave significantly lower ratings for having sufficient Internet equipment and access than those respondents who had an Internet-connected device for every student.

Professional Development Opportunities Needed

Research Question 5: What professional development opportunities for using Internet-enhanced instructional strategies are needed by Georgia secondary Agricultural Education teachers who participated in the study?

In order to answer research question 5, respondents were asked to list in the online survey any areas for which they needed professional development regarding using the Internet in their classrooms. Respondents listed several areas (See Table 32), but the two most frequent responses were "Course delivery" and "Record keeping," with 23 instances each. The next most common area listed was "Google Classroom" with 18 mentions. "Research" was also listed several times (13) as an area in which respondents needed professional development. "Anything new" (2) or "All the above" (3) were

mentioned for a total of 5 times. Other areas mentioned were "Analyzing tests for data," "Flipped classrooms", "Cloud-based apps", "Learning Management Systems", "specific uses for agriculture", "Competition preparation", "Monitoring student use", "Microsoft Office programs", "FFA proficiencies" and "Website development."

Table 32

Professional Development Responses

Professional Development*	Responses*
Course Delivery	23
Record Keeping (AET)	23
Google Classroom	18
Research	13
Anything new or All the above	5
Microsoft Office programs	2
Cloud-based apps	2
Flipped classroom	2
Analyzing tests for data	1
Website development	1
Competition preparation	1
Monitoring student use	1
Learning Management Systems	1

* Some respondents gave more than one response.

Section Two: Results of the Interviews

Qualitative Interview Findings

Interview participants provided numerous responses to the questions asked of them. All participants were asked the following questions: (See Appendix H for complete interview questionnaire)

1) "The data show that almost 98% of surveyed Agricultural Education teachers use the Internet to some extent to enhance learning in their classroom. Would you agree this is representative of actual Internet usage by Georgia Agriculture Teachers to enhance learning? Why or why not?"

2) "Respondents to the survey gave a small picture of the current uses of the Internet in the classroom. They indicated high usage of the Internet by students for research and by teachers for CDE preparation, communication, presentation and record keeping. If you do so, how do you specifically use the Internet to enhance learning in your classroom?"
3) "Survey analysis revealed that Agriculture teachers with 20 years or less teaching experience believed they used the Internet more effectively in their classrooms and have higher confidence in using the Internet than Agriculture teachers with 21 or more years of experience. Why do you believe this is so?"
4) "What, if anything, can be done to encourage older teachers to use the Internet to enhance classroom learning?"
5) "Although 98% of surveyed teachers used the Internet to enhance learning in their classroom, analysis revealed that Agriculture teachers with 14 or fewer Internet-connected devices in their classroom believed they did not have as sufficient a number of devices in their classroom to access the Internet as those in a 1:1 school. What other factors have you found, from your own experience, can discourage the use of the Internet to enhance learning in the agricultural classroom?"
6) "Conversely, what other factors have you found, from your own experience, can encourage the use of the Internet to enhance learning in the agricultural classroom?"
7) "Survey analysis revealed that most teachers have learned how to use the Internet to enhance learning from their own independent learning and

interaction with other teachers rather than from their degree work. Where have you learned how to use the Internet to enhance learning in your classroom?"

8) "What advice or recommendations do you have for professional development so that you and other teachers may improve using the Internet to enhance the classroom?"

Only the interview participants (N = 6) who did not have enough devices for every student in their classroom [not 1:1 schools or less than 28 Internet-connected devices in their classroom] were asked the following question:

9) "What strategies have you used in your classroom to overcome a lack of Internet-connected devices when using the Internet to enhance learning?"

In order to maintain anonymity, the following pseudonyms will be used in place of real names for the results of the 8 interviewees, but actual demographic characteristics were used. Rex is a 25-year-old male with 2 years of experience teaching at the middle and high school level in a rural area. Cassie is a 26-year-old female with 4 years of experience at an urban middle school. Shirley is a 29-year-old female with 5 years of experience that teaches in a multi-teacher, agricultural program at an urban high school. Steve is a 34-year-old male with 10 years of experience at a multi-teacher program at a rural middle school. Payton is a 45-year-old male with 17 years of experience teaching in a rural high school. Delores is a 49-year-old female with 7 years of experience teaching at an urban middle school. Suzy is a 54-year-old female with 29 years of experience at a suburban high school. Dave is a 56-year-old male teaching in a multi-teacher department at both the middle and high school levels in rural schools who has 31 years of teaching

experience. These individuals, when viewed as adopters in the theoretical framework of the Diffusion of Innovations and based on teaching experience, can be categorized as: two innovators, one early adopter, two early majorities, two late majorities and one laggard.

Interview Analysis of Extent of the use of Internet-enhanced Instruction

Research Question 1: What is the reported extent of the use of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participated in the study?

To address Research Question 1, participants were asked if they agreed with (followed up by why or why not) the survey finding that almost 98% of surveyed Agricultural Education teachers use the Internet to some extent to enhance learning in their classroom. Some of the interview participants agreed with the survey findings. Payton stated that "I would say yeah. The ag teachers that I know are using the Internet and are using the technology that goes along with the Internet in their classroom on a regular basis." Delores echoed her agreement by stating "When I have gone to summer and winter conference [bi-annual Georgia Agriculture teacher's meetings], there have been cutting edge technology sessions that made me feel that everyone else is in a similar state to using the Internet, if not beyond what my district is doing."

Despite their overall agreement that 98% of Georgia Agricultural Education teachers are using the Internet, some interviewees did not completely agree with the research findings. Rex stated "Talking about enhancing the classroom, I'm not really sure if that is true, but I think everybody's gotta use it." He went on to say that "Our school system is forcing us to use the Internet in everything with our classroom." However, he

went on to state that "I'd say that everybody is using but probably not everybody is using it to the same degree to enhance the classroom." Dave agreed in part with the survey findings by stating that "From my discussions with ag teachers, that a lot of them use the Internet. The usage is probably 98% or higher even." However, he went on to state that, "However, since the survey was online, maybe many who do not use the Internet in their classroom did not fill out the survey." Shirley stated that "It seems super high to me, to be honest. I definitely think that 98% of Ag teachers have to use the Internet for their programs even if it's just doing program of work or e-mail or whatever." She went on to state "I know a bunch of ag teachers who I don't feel like use it to the extent. Maybe they use it once a month or once a week. We do it extensively here, but we're also blessed with a lot of technology as well." Steve related that he used the Internet to enhance his lessons but that he doesn't allow student-focused use of the Internet. He stated "I think 100% [of Georgia Agricultural Education teachers] use the Internet, but as for enhancing education …I use it as a teacher, but I don't let my students use it." Therefore, survey participants expressed overall agreement with the survey findings that almost all Georgia Agricultural Education teachers (98%) used the Internet but they did not completely agree that 98% used the Internet to enhance learning in the classroom. There was also disagreement as to the extensiveness or degree of the use by all teachers.

Interviewee's Current Uses of Internet-enhanced Instructional Strategies

Research Question 2: What are the current uses of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participated in the study?

To address Research Question 2, each interview participant was asked how he/she specifically used the Internet to enhance learning in his/her classroom. The answers to this question were coded into the following categories: contest [CDE] preparation, Student assessment, record keeping, student-focused lessons, and teacher-focused lessons.

Contest (CDE) Preparation

All interviewees stated they used the Internet for CDE preparation. CDE stands for Career Development Event, which are contests in which National FFA members compete in to test the knowledge and skills learned through Agricultural Education instruction. Shirley stated "We use Google classroom for all of our CDE teams." She went on to describe how she uses Google Docs to collaboratively work on student "speeches so I can edit their document and they can edit it and it saves automatically." Rex also used Google Classroom for CDE preparation. He stated "I have a Google Classroom that for different contests that they can do..." Cassie stated that when preparing for CDEs that required students to be able to identify plants, animals, tools, etc., she utilized "… Kahoot! and Quizlet. Things like that where they can practice identification whether it's for the terminology or the pictures of something." Payton also used Quizlet. He stated "We sometimes use the Internet for CDE prep in the form of Quizlet." Dave stated that he has "… used it [the Internet] for team preparation as far as getting teams ready for local, state and national contests." At another point in the interview, Dave related the power of using the Internet for CDE preparation:

> The year my father passed away, we were preparing for a state contest. And it wasn't where I could be with my team to get ready for the test

material [for the contest]. But I already had test material uploaded. And they basically studied and trained with themselves with the stuff that I had online and then they went on and won state. Got to go to national with it. That showed me this would work.

Even though Steve did not let his students use the Internet individually in class, he stated that at after school practices "I'd be a fool not to let them [students] get on the Internet and print that material out and study." Even though the interviewees used the Internet in different ways, using the Internet for CDE preparation was commonly reported.

Student Assessment

Six of the eight interviewees used the Internet for student assessment. Some interviewees used the Internet for summative assessments, but most assessment was formative. For summative tests, some used Google Forms. Delores stated "I use Google Forms for giving tests." Dave gave summative tests on his own website. He stated "We have a website that we use to do online testing with and that part I love. The fact that I ain't got to sit down and grade all them papers." In addition to using Quizlet and Kahoot! for CDE preparation, Rex and Suzy both used them for formative assessments. Suzy stated "I use Quizlet quite a bit for review …" Shirley used Google Docs for formative assessments. She communicated "We take our tests online, or most of our tests online."

Record Keeping

All but two of the interviewees used the Internet for the purpose of record keeping, though Cassie's students used the Internet to a very limited extent for record keeping. Shirley stated "For record keeping we use the AET for our program. We pay for

that every year." The AET, Agricultural Experience Tracker, is an Internet-based recordkeeping system that many Agricultural Education teachers across the United States allow their students to use for record keeping (AET, 2017). Dave, Suzy and Payton also used the AET for online record keeping. Payton stated "Every Wednesday my kids have the first 15 minutes of class to update their record books using the AET." Delores did not use the AET but instead used Google Docs for her online record keeping in that "We upload our SAE files to Google to share among teachers and students." Even Steve used online record keeping. He stated "… I have five desktop computers that we use for middle school record books …"

Two of the interviewees mainly used traditional paper record books instead of the Internet for record keeping. Even though Cassie stated that "Some of them [students] keep up with their record books on a [Internet] file," she went on to relate "I used to use the AET for record keeping but found it was too complicated for the sixth grade especially, so I went back to a record book or poster. Also, a lack of technology to update regularly also impacted not using AET." Rex also stated "We don't use the AET."

Student-focused Lessons

Another common use of the Internet given by 6 out of 8 interviewees was student-focused lessons. This was where students got on an Internet-connected device and completed an online assignment. Each Wednesday, after they updated their online record books, Payton's students "Usually, when they finish that up I try to have something for them to do since they've already got the computers out. I use Google Classroom to kind of fill up the rest of that class period." Payton went on to state how greatly his students benefited from online lessons:

> I also do like the fact that because it is there, I feel like my kids get more out of me being gone now than what they did before when I didn't use that technology, because they can use Google Classroom and they can work on stuff just like I was there. Where in the past the only thing that I could do was, here's a book and answer these questions kind of thing.

Shirley echoed this appreciation for online lessons by stating "...I'm a Google person. I use all of that, like I barely give out paper in my classroom. I could teach my entire Basic Ag class without printing out one sheet of paper." Cassie also used a great deal of online, student-focused lessons:

> Instead of me getting up in front of the class teaching one thing, I give the students a category of something that they're interested in. So they have the choice between four subjects. Then they have assignments. Some of them utilize something such as ICEV to complete the video and then it has PowerPoint and they can work through that and then they can have activities like matching or definition-type stuff.

Suzy had students complete self-paced lessons using their desktop computers where she had "… little worksheets that go along with the PowerPoint presentations that are on the GAAGED website." Cassie stated one benefit of these types of lessons where "they can kind of work at their own pace and they can get ahead or if they need some remediation they're good about coming to me."

Teacher-focused Lessons

A final category of answers to the question of how respondents were using the Internet in their classrooms was teacher-focused lessons. This is where the teacher uses Internet technologies to enhance the learning of all students from a projector at the front of the room. There were four respondents who mentioned this type of use. Some respondents presented lessons on the screen using PowerPoint presentations. Rex stated he "... mainly utilize stuff off the board." However, many respondents presented YouTube videos to enhance lessons. Dave stated "I use YouTube a tremendous amount." Steve, the respondent who filled out the survey stating his students used the Internet zero hours per week, said he showed YouTube videos to enhance lessons on the screen at the front of the room. "We use YouTube videos for livestock judging so they can hear those terms and learn how to give a set of oral reasons." In fact, at a later point in the interview he related how much he valued using YouTube videos to enhance learning in his classroom by stating "So I find YouTube videos and I let em watch that instead of me telling it to em. They'll watch that video for some reason. And that's just that generation." He also related a story about how well students responded to videos from a presentation he witnessed at the FFA Day at the Georgia National Fair. There was a guest speaker addressing a large group of students and most students were not paying attention until the speaker played a video.

> Those kids didn't pay him very much attention. But when he put that YouTube video *of him speaking* [emphasis], it was a dead quiet and them kids was honed in on that video. And it was the same guy, same message, but it was just in a different form. And when the video quit

and when he went back to talking, they went right back to what they were doing. They weren't paying attention. And I was like oh my Lord. These kids will not listen to a live man but you give em a YouTube video and they are honed in on it.

Interviewees' Comments on Factors that Encourage or Discourage the Use of Internet-enhanced Instructional Strategies

Research Question 3: What are the demographic and perceived intrinsic and extrinsic factors and variables that encourage the use of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participated in the study?

Research Question 4: What are the demographic and perceived inhibiting factors and variables that discourage the use of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participated in the study?

Years of Teaching Experience

Years of teaching experience was found to be a significant factor affecting Internet use in the Quantitative section of this study. In order to further address Research Questions 3 and 4, interview participants were first asked their opinion of why Agricultural Education teachers with 20 years or less teaching experience had a higher confidence in using the Internet and believed they used it more effectively than those with 21 or more years of experience. Overall, respondents attributed those results to the fact that Agricultural Education teachers who had been teaching for 21 or more years did not grow up with or go through college with the Internet and as such are not as comfortable with using it. Dave stated that younger teachers have more confidence,

"Because they grew up with it. It hasn't been around that long. I have been teaching for 31 years and for less than half of my career it has been around." Shirley (5 years' experience) responded similarly by stating:

> Because most of those people who have 20 years or less at least have had the Internet for some portion of their life. We are almost digital natives, but we're not there yet, like we didn't start with a cell phone in our hand like my daughter who is almost 4 and can use the phone better than I can. They grew up with it, or they went through college with it, or even grad school with the Internet. So they feel more confident because they've had to use it for longer than those ag teachers with 21 or more years.

Cassie echoed this sentiment when she related that she "... taught with a man who had been teaching 42 years, and he could turn on a computer and that was about the limit of it. He was more of a stick to what I know, read the textbook and answer the questions at the end of the chapter and go from there." Steve, a self-proclaimed non-Internet user with 10 years' experience, also confirmed this interpretation by relating that he was in an in-between technology generation called the "Oregon Trail generation, and that's those that were born between 79 and 84, because we were the last group of students that could have graduated from a four-year university without Facebook." He explained that he was not that much older than the generation of teachers following behind him, "a younger person is gonna feel more comfortable with the technology because they grew up with it … just the way they had computers in their house where I didn't growing up." He also explained those teachers in the "… generation before me didn't grow up with computers;"

yet even though he used computers in his younger years, those teachers in the generation behind him "had computers in their house where I didn't growing up." He also stated that "… a younger person is gonna feel more comfortable with the technology because they grew up with it, where that older teacher, even though they ain't but 10 years apart," is not as comfortable with technology. Suzy, a teacher with 29 years of experience, summed it up like this:

> I can speak for the ones 21 and above on the years of experience, we didn't grow up with it. This was secondary for us, and we had to learn it on our own. Whereas the younger folks coming through now, I think, have grown up with it. And I am always afraid I am going to break something or get lost or go somewhere I shouldn't go. But I am getting over that now.

Therefore, most respondents attributed the confidence of teachers with 20 years or less experience using the Internet to the fact that it was not available to older teachers as they completed their own education.

This question was followed up with a question asking respondents "What, if anything, can be done to encourage older teachers to use the Internet to enhance classroom learning?" Since the answers to this question were more relevant to the results for the last research question on professional development, they were included in the section for Research Question 5 later on in this section.

Availability of Internet-connected Devices

Another factor that affected Internet use was the availability of Internet-connected devices. In order to further address research questions 3 and 4, interview participants

were asked “What strategies have you used in your classroom to overcome a lack of Internet-connected devices when using the Internet to enhance learning?” Only two strategies emerged from the respondents’ answers. These strategies were using a school computer lab outside of the classroom and allowing the students to bring their own device, commonly called BYOD [Bring Your Own Device].

Four interview participants related they sometimes took their students to a computer lab located outside of their own classroom, but there were difficulties with this strategy including taking away from class time to transfer students to and from the computer lab and competition with academic classes. Steve stated “We could use the computer lab on the other side of campus, so it takes time to get over there.” Rex stated “Every once in a while we go to the computer lab …” Cassie also stated “We have a computer lab across the hall,” and Dave stated “We book the computer lab when we can book it.” However, all three of these respondents (Rex, Cassie and Dave) related how academic classes, e.g. mathematics, science and language arts, take precedence over CTAE courses like Agricultural Education. Rex stated “Sometimes we go to the computer lab and somebody else is already in there. We do the best we can.” Dave, very similarly, stated “Our school system doesn't have the facilities or the equipment. We got 750 students and two computer labs for the entire school. The English department usually ties those up at certain parts of the year, which kinda puts us into a bind.” Cassie agreed that CTAE courses had less priority than academic courses by stating “While we do have access to computers, sometimes … our access to them is set behind those that need them for, you know, more of the academic subjects.” Therefore, although computer labs were available to Agricultural Education teachers, even that availability was greatly

hindered by a perceived priority for academic class use of computer labs and the extra class time that was required to move students to an external computer lab.

The second strategy interview participants used to overcome a lack of Internet-connected devices was to allow students to bring their own devices [BYOD]. However, there were some who had difficulties with this strategy and some who refused to allow student-brought devices at all. Cassie stated "I allow kids to bring their own devices," but she sometimes had difficulties with allowing this because "The kids who don't have a device might be embarrassed and won't say anything." Rex stated "We tried to do Kahoot! and only about six people can connect at a time." Even though Shirley is now 1:1, when she did not have enough classroom devices for every student, she allowed her students to use their cellular phones to access the Internet. However, managing or monitoring student misuse of these devices proved challenging. She stated "... Before we were 1:1 at our school ... we would use phones, because a lot of the kids have phones or capabilities to use their phones, but then I'm like: Are they on Snapchat? Are they on Instagram? ... So a lot of times, people say no technology at all because it's easier to manage it if you say none ..." Although Suzy has a computer for every student in her room, she still allows her students to BYOD. "A lot of times I let them use their phones unless we are typing something out. And a lot of times they can get to a website faster on their phones than they can on the desktops." Dave doesn't allow his students to BYOD at all. He stated "I don't let them use their phones." Rex also explained the difficulties with allowing students to BYOD: "A lot of times ... they get out their phones and stuff to do the Kahoot! and a lotta times they just play around."

Finally, when discussing lacking access to Internet-connected devices, Dave stressed the importance of every student having his or her own device. "These kids don't need to be 2 [students] to 1 computer. In the shop if you're welding, you can put two or three kids on one welder. You can't do that with a computer because everybody wants to get involved." Cassie echoed this need for every student to have a device. "Sometimes when you have to buddy up, it doesn't work." Even though Agricultural Education teachers partially overcame a lack of Internet-connected devices in their classrooms by utilizing a computer lab and allowing students to bring their own devices, competition with academic classes and the difficulties in allowing students to BYOD still inhibit Internet use. Rex summarized this challenge by stating "A lack of devices is definitely a limiting factor."

To further investigate factors that inhibited Internet use, a follow-up question asked interview participants "What other factors have you found, from your own experience, can discourage the use of the Internet to enhance learning in the agricultural classroom?" Four main factors - technical difficulties, lack of time, a tendency for students to get off task, and a desire for hands-on learning - emerged from the interviews, with other factors mentioned by just one participant each.

Technical Difficulties

One factor that three interview participants mentioned was technical difficulties. When asked about other factors that affected Internet use, Shirley stated "Technical issues with devices." Cassie also mentioned this factor. She stated "If the Internet goes down...the ability to get stuff done when it's down … you have to have a backup plan." Dave further explained the problem when just one student had a technical issue. "One

person's computer screws up, then that screws everybody else up." He went on to state "If you go in there [the computer lab] with a 50-minute class period and you spend 30 minutes trying to get the damn computers working, then you just wasted half a day and really haven't accomplished anything."

Time

Another factor that interview participants related that inhibited using the Internet to enhance learning was the amount of time it took to prepare online lessons. Dave reported that his use of the Internet was limited by "Having the time to get the stuff uploaded or put on the Internet or whatever. Google classroom is a great thing but somebody has gotta put that stuff on there." Payton agreed that time was a limiting factor. He stated "The biggest problem for me is finding the time to become familiar with something new." He also related that he had been appointed the lead instructional teacher for CTAE in his school and found that he could "show people a million times to do something; but until they take the time to sit down and work with it and do it themselves and really figure it out on their own, they're not gonna adopt it." He went on to state the importance of time in that "finding that time is probably in my opinion the biggest hurdle to overcome."

Student Distraction

A third inhibiting factor that survey participants detailed was the tendency of students to become distracted when allowed to use Internet-connected devices. Delores shared that when she allowed her students to use an Internet-connected device they "immediately play games. Once they are given [a device] it is like opening Pandora's box." In fact, she went on to relate that despite the fact that her district heavily pushes

student use of the Internet, she would actually be reprimanded by her administration "if my students are off task. So I really limit the amount of time that we spend on the Internet." Rex also communicated his frustration when students accessed the Internet in his classroom. "To me it's more a hindrance of trying to keep your classroom under control if they are out there playing on their phones all the time, and you gotta constantly monitor em … to make sure if they are actually doing what you told them to do." Suzy also faced challenges with student distraction. "I probably say 500 times a day: 'Put your phones up!' I call them pacifiers." Cassie also reported a problem with students getting distracted when using the Internet. "I think the social media thing. It can be limiting ...If you have to do BYOD. Then you're gonna have people on their own phones. Then I think that, that aspect is a disservice in the classroom."

Desire for Hands-on Learning

A fourth factor that was mentioned by two interviewees was the desire for their students to experience hands-on learning. Because Agricultural Education involves a great deal of experiential, hands-on learning (Georgia Agricultural Education, 2017), some interviewees had a desire to limit the amount of Internet technologies when students came to their classes. Steve stated "They are inundated so much with technology, when they come to my class, I'm gonna give them a reprieve from technology." Delores also echoed her desire to limit how much time he students spent on the Internet. "I put a great importance on actually getting outside and working in the greenhouse and in the garden and with animals rather than being inside on a computer."

Unique Responses

There were two other inhibiting factors mentioned by only one interviewee. A limiting factor that Shirley relayed was the problem of cheating when students take online assessments. "We take our tests online, or most of our tests online. Where the kids have all of their notes online as well. So I found … there were kids cheating." To combat this problem, she related that "I just make sure that I have a one color screen for when they take their tests and its different for every class period. And they have to face a certain way in the room so I can see all their screens." Finally, Suzy shared that because the Internet changes at such a fast rate, that before she used a lesson on the Internet "You have to go in and check before you actually teach the class." She related that "… the University of Kentucky had a wonderful website for learning activities and it just went away." She also reported that even though educators believed "that students are very proficient on the Internet. Well I have found that they are really not." She stated that "researching and finding particular websites that are credible" was sometimes "a struggle for them." Therefore, cheating and the dynamic nature of the Internet also inhibited the use of the Internet.

To further answer research question 3, survey participants were asked "Conversely, what other factors have you found, from your own experience, can encourage the use of the Internet to enhance learning in the agricultural classroom?" Two basic themes emerged from the interview responses: using the Internet to enhance learning effectively engaged millennial students as well as made the Agricultural Education teacher's teaching task more efficient.

Effectively Engaged Students

A consistent response of the interviewees given by 7 out of 8 respondents was that students were effectively engaged by using the Internet to enhance learning in the Agricultural Education classroom. Several specific examples were shared by the interview participants. Cassie related that students "… would rather do something on technology than on paper. They hate writing. They are way faster at typing than writing." She also stated that her students liked the "instant gratification" of having their scores on quizzes and exams graded immediately by online scoring and that the students experienced "… more success than having to wait on me to grade something." Suzy also related that students liked the "instant gratification" when using the Internet and they liked the "graphics that a worksheet does not provide." Rex shared that students enjoyed using the Internet in the classroom. He stated "Just with a few Kahoot!'s we have done. It helps out. They have a good time. They enjoy the class." Cassie echoed the idea of student enjoyment. She stated "… they love to play games or the competitiveness you can add with the Kahoot! or Quizlet." Steve related the effectiveness of using videos to reach students. He stated "I find YouTube videos instead of me telling them." Dave also discussed the effectiveness of videos. "I can stand in my classroom and explain all day long how to do something. But if I can throw a YouTube video that does the same thing that I am doing, for some reason it clicks with them versus me standing there and telling them over and over again."

Made Teaching Easier and More Efficient

Another common encouraging factor was that using the Internet to enhance learning made the task of teaching easier and more efficient. This was mentioned by 5 of

the 8 participants. Shirley stated that using the Internet "Makes my life easier." She went on to relate that "The reason I do Internet and Google stuff is because one I have access to it all the time. And I don't lose papers. I can do work and I cannot lose papers." She went on the share how some students would say "I lost my paper." Because all student work was online, she could tell them, "No, its online. There's no way you can lose it." Having student work on the Internet also "… makes my life easier with parents. When parents have complaints. Here is a screenshot of what your kids did. I still have papers but they are all digital." Delores also related that having student work online made her job easier. She stated "It is easy for me to check their work. If they share it with me, it is mine too." She also communicated that working with students on the Internet was "Almost like a virtual reality you have going on with the student." It allowed her to provide a level of feedback on student work "that you might not have the chance to do in class." Cassie shared how using the Internet allowed her to differentiate for students who learned at different speeds. The online assignments allowed for the students who "learn at a slower rate" and "don't finish in class" the ability to finish at home while those students that learn at a faster rate and say "I need something else, I need something else," the ability to have enrichment activities. Dave, as quoted previously, also stated the automatic grading in Internet-based testing saved time because he did not have "to sit down and grade all them papers."

Payton related how using the Internet-based AET record book site saved him time. "I looked at how much time it [using the AET] was going to save us when it came to proficiency awards and degree applications and things of that nature. That benefit to me was huge because it saved a lot of my time." Rex also shared that despite taking time

up front, using the Internet made his job easier. "If you can use Google classroom stuff and know how to use it and put the time in, it really makes things a whole lot easier, but it's a lot of work in the front, but the rewards are pretty good."

Interviewees' Interpretation of and Suggestions for Professional Development

Research Question 5: What professional development opportunities for using Internet-enhanced instructional strategies are needed by Georgia secondary Agricultural Education teachers who participated in the study?

In order to answer research question 5, respondents were asked three questions. The first was a follow-up to soliciting respondents' opinions about why Agricultural Education teachers with 20 years or less experience had higher confidence in using the Internet than older teachers. The questions asked "What, if anything, can be done to encourage older teachers to use the Internet to enhance classroom learning?" Interviewees were also asked "Where have you learned how to use the Internet to enhance learning in your classroom?" Finally, interviewees were asked "What advice or recommendations do you have for professional development so that you and other teachers may improve using the Internet to enhance the classroom?" Several key themes emerged from the answers to these questions.

How to Encourage Older Teachers to Use the Internet to Enhance Learning

Individuals stated that it was often difficult to encourage older teachers to use the Internet. However, the most frequent response given by five out of eight interviewees when asked what can be done to encourage teachers with 21 or more years' experience to use the Internet was to "show" them not only the benefits of using the Internet to enhance learning in the classroom but also "show" them how to do so.

Although Dave was a teacher with 31 years' experience and has used the Internet in his classroom, he expressed his doubt that most older Agricultural Education teachers could be encouraged to use the Internet. He stated" To be honest with you, I don't know that your gonna, you know … Old folks is stuck in their ways." Steve also expressed his reservations by stating "I think if they've been teaching that long, they've probably got it figured out, what works and what don't." Delores also expressed her own reservations on using the Internet:

> You [her students] are on your computer in all your other classes; in mine we just aren't gonna open it. There's part of me that wants to do that and I am an older teacher. I don't have that much experience teaching Ag Ed, but it could be personal preference and I do think that might come with age.

Respondents repeatedly used the word "show" when they discussed what can be done to encourage older teachers to use the Internet. Steve talked about showing teachers how to utilize older resources with which they were familiar and that are now online such as old, uploaded television shows. He stated "I think that maybe if they were shown … find some things that fit the style of the old ag teacher like [projecting an online video of] Norm Abram on New Yankee Workshop." Cassie discussed showing older teachers "where some people are having success in it, how they can implement it and, you know, bridge the gap between that generation that they are teaching and that generation that they are from." Payton echoed this sentiment by stating "It's like anything else. You're gonna have to show them the value of it and the benefit of it before they're gonna adopt anything new." Several individuals stressed the importance of demonstrating one use of

the Internet at the time when showing older teachers how to use the Internet. Shirley stated:

> I think you just have to really take one step at a time. A lot of times at professional development … they might throw so much stuff at you at once and you feel like you have to implement everything. If you did one thing, like you are going to learn how to use Google Docs this year or this semester, and just having small incremental goals for those teachers.

Rex also discussed the importance of not overwhelming older teachers with too many Internet uses at one time:

> All these classes we go to at our school, they just kind of throw three or four programs at you at one time, and not really sit on one and show you how to use one. I guess like if you had older teachers and just showed them how to use one thing and was very deliberate with it and just talked real good, I guess maybe like a one-on-one. I guess it would kind of help.

Despite some reservations about the success of the ability to encourage older teachers to use the Internet, interviewees emphasized the importance of showing how other teachers have had success using the Internet, but stressed the importance of showing one use at a time.

Where Interviewees Learned How to Use the Internet to Enhance Learning

Independent learning was the most frequently mentioned response as to where using the Internet was learned. Additional sources of learning were from other teachers, through professional development, through college coursework and from their students.

Interviewees repeatedly stated that they learned how to use the Internet by their own independent learning, some through "trial and error." When asked how he learned to use the Internet, Payton answered "Trial and error. Doing it on my own. That's pretty much it …" Dave and Suzy both included "Trial and error …" in their answers. Dave also stated "… most of my training as far as that goes is self-taught …" Shirley responded, "The Internet that I use in the classroom, most of it is independent learning ... I think people my age and maybe younger feel more confident just playing around with the Internet and figuring it out rather than being overwhelmed." Rex also answered similarly.

> ... a lot of the stuff in these past 3 years as teaching, I've done on my own ... I've done a lot of investigation on my own to try to learn how to use these different things. That's probably been the most beneficial. Just did my own thing. I work better when I'm focused myself trying to figure out myself have a goal instead of sitting in a class of a bunch of different people.

Independent learning was a major source for learning how to use the Internet.

Interviewees also gave other teachers as a source for knowledge on using the Internet. Suzy answered, "Probably more from teacher interaction and sitting around underneath the oak trees at the [FFA/FCCLA] camp." In addition to independent learning through trial and error, Payton also included other teachers as a source for learning. "I talk to another, younger teacher usually. I get to talk with them about something they've done in class and what's worked for them and I then go back and look into it and research it myself." He went on to state that he learned from other teachers in

his school. "We got some folks that are really good about using technology in the classroom and I talked to them about how they use it. And what they do we did ..." Rex also mentioned "talking to other teachers," in his response. Dave stated he learned "from people that I work with that knew how to use technology." Delores included other teachers as well as administrators and staff members as sources for learning. "I'd say yes; I've learned from my peers. I've learned from administrators in the school. Definitely the media specialist."

A third source of learning how to use the Internet that interviewees gave was professional development. Shirley included professional development with her independent learning as a source of her learning how to use the Internet in her classroom. "The internet that I use in the classroom, most of it is independent learning or professional development through my school … all this stuff I use in the classroom has really been self-taught or in PD [professional development]." Cassie stated she "learned a lot through taking courses, like professional development courses." Rex included professional development in his answer as well by stating that he had learned "… from like going to PLU's [professional learning unit courses] …" Delores stated she was required to utilize the Internet in her classroom by her administration:

> I feel like I learned trial by fire, in that we have been required to use this, required to do that. We will have the sessions on teacher workday or teacher professional day and we have rotating sessions similar to what you might see at summer [Georgia Vocational Agricultural Teachers Association] conference ... Also, if all the teachers are using one thing and you are not, you really must make your case for why. They'll ask

> you why. You don't want to let them know it's because you don't know how.

Payton also stated he had learned a great deal from professional development at his school:

> When we were going through the stem program through the stem grant. That was one of the requirements of the grant was that we got professional development on using technology. And I don't know if that wasn't so much of a springboard for me because doing that I learned to do different things and saw how well it worked and how easy it worked. So I started implementing other things after that on my own.

Professional development was a major source of learning to use the Internet for interviewees.

Other sources of learning to use the Internet to enhance learning reported by interviewees were college coursework and students. In addition to independent learning, Rex "learned the basic stuff I think actually in high school. How to use the internet and stuff and then in college. That's most everything we did was Internet stuff." Cassie also learned independently but as a result of completing her college coursework. "I'm going to say a lot of it through my coursework ... where I went to school at they were very behind in technology uses ... so I definitely had to learn on my own through my college coursework of doing stuff at home." Suzy learned from completing her college coursework as well. She learned "... to some degree my graduate work kind of forced me to look at ways to research and do some things online as far as online communications and that kind of thing." However, Suzy also learned from her own students:

> The kids will find a lot of things and you know when you send them on a wild goose chase. It's amazing what they'll find searching for something else and they'll find activities. That's the way we found that purposefulgames.com because the University of Kentucky site was not there anymore. So I said let's just Google some games and see what we can find and one of the students found that. So it's just trial and error and sometimes as a teacher you don't want to be out of control for your classroom like that but sometimes you got to let go of the reins a little bit and let them see what they can find and help you find it cause I certainly don't have time to sit there and go through all those websites and look to see what works.

Even though independent learning was mostly reported as the primary means of learning, some interviewees learned how to use the Internet to enhance learning as part of their college coursework as well as one interviewee who learned from her students.

Recommendations for Professional Development

Several suggestions emerged from the responses of interviewees' when asked for advice and recommendations for professional development for the improvement of using the Internet to enhance the classroom. These included focusing on one Internet use at the time, having an open forum, starting a mentoring system, having a round table discussion and instruction on using specific Internet technologies.

Similar to the responses to the question of what can be done to encourage older teachers, interviewees suggested professional development should start simple and focus on one Internet use at a time. Shirley related that when she had conducted professional

development classes on “Google classroom or online notebooks,” she believed that the topic was often “way over the head of some people … who don't know how to use the internet at all, and if they came to my session they would be super overwhelmed.” Cassie also emphasized the importance of starting small with professional development. She suggested that instead of an approach where the instructor says “here's what I do in my classroom,” provide specific step-by-step training to “show the steps of it.” Rex responded that the “biggest thing was just focus on one thing and show you how to use one thing instead of … throwing three different things at one time.” He went on to relate that he had attended a professional development class where “they showed us how to use Kahoot! and I think everybody in there knew how to use it after that.” He further stated that this method of professional development was more effective because the instructor showed them how to use one Internet technology “and we learned how to use it instead of them just throwing it at us assuming we knew how to use it and then going on to something else.” Like Rex, Payton suggested that professional development should “find something that's simple to start with and have a big payoff” for teachers and students. Payton further suggested that professional development needs to “start small with one thing and figure out how you can add to that one thing or add to one class over the period of a year and then maybe the next year add to another class.” He went on to suggest that professional development needed to “involve continuous growth and improvement. It’s not a one-and-done kind of a thing.”

Besides the need to start with one simple Internet use at a time there were other suggestions for professional development. Shirley suggested having a mentoring program where teachers would “have somebody they know they can call on and ask who

is an expert and not feel like they're taking away their time." She also suggested having an open forum where individuals would be comfortable asking questions of a group and not "feel like they're thought of less when they ask questions." Steve suggested having a round table discussion with "… four or five teachers leading a group and they are all sharing amongst themselves and then the audience is listening." He believed this would be more effective than having a large group discussion with "… 30 teachers in there with an opinion session."

Finally, there were suggestions on the need for professional development that included training in specific Internet technologies. Dave suggested there was a need for instruction on using the AET online recordkeeping website. Suzy and Delores both expressed the need for training in the use of Google Classroom. Suzy stated that instruction on Google Classroom had occurred at past GVATA conferences and she believed "if they could continue with that [Google Classroom instruction], that would be wonderful." Delores also related how she had benefited from past professional development on using Google Classroom at past GVATA conferences where "they went through different aspects of Google Classroom that I didn't know about … so, that was really helpful." She also stated that "All I know is Google Classroom, because that's what our district uses. So maybe if there were other districts out there that use something different, that [professional development in other Internet technologies] would be helpful … because I feel like I'm kind of one-dimensional."

Summary of Findings

The first portion of Chapter 4 reflects the findings and data collected from 237 participants who completed the survey titled "Survey of Internet-enhanced Instruction in

Georgia Secondary Agricultural Education" as well as the demographics section included in the survey. Overall, the results of this study revealed that the majority (98%) of participants used the Internet to some degree to enhance learning in their classrooms. The amount of usage varied, but one-third reported using the Internet one hour or less per week while almost two-thirds reported using the Internet two to ten hours per week to enhance learning in their classrooms. Most participants used the Internet in their own classrooms and 86.3% had at least one Internet-connected device in their classrooms while 13.7% had none. Major uses of the Internet were as a research tool for students, classroom presentation tool, contest preparation, as a communication tool, and record keeping. Survey participants rated low their use the Internet as a reward, to administer assessments, for small group instruction, or to tutor. Most survey participants learned how to use the Internet from their own independent learning and interaction with other teachers. The majority of participants rated support factors from their school as high with the exception of time. Overall, participants also rated their confidence and comfort using the Internet as well as their attitudes towards using the Internet as high.

The associative statistical analysis found a significant effect existed on survey ratings by age, total years teaching, and the number of Internet-connected devices in a respondents' classroom. However, the number of hours spent using the Internet did not have a significant effect on ratings. Results showed that respondents aged 40 or less were significantly more likely to have acquired Internet skills as part of their undergraduate degrees than older respondents. Additionally, results showed that respondents with less than 5 years of experience were more likely to learn how to use the Internet as part of their undergraduate degrees than those with more experience. Results also showed that

respondents 40 years of age or less believed they used the Internet more effectively and had a higher confidence than those 51 or older. Finally, respondents with 14 or less Internet-connected devices gave significantly lower ratings for having sufficient Internet equipment and access than those who had an Internet-connected device for every student.

The second portion of Chapter 4 reflects the findings of the qualitative interviews I conducted with individuals across demographic and situational variables. The qualitative data revealed that participants agreed that 98% of Georgia Agricultural Education teachers use the Internet although some were doubtful if the usage actually enhanced student learning. The data further revealed that participants used the Internet for CDE [contest] preparation, student assessment, record keeping, student-focused lessons, lesson presentation, and enrichment. Respondents attributed the fact that Agricultural Education teachers who had been teaching for 21 or more years did not grow up with or go through college with the Internet to their not being as comfortable using it as those teachers who did. To overcome a lack of Internet-connected devices, participants used a school computer lab and allowed the students to bring their own device. Besides a lack of devices, technical difficulties, lack of time, and a tendency for students to get off task also inhibited respondents from using the Internet in the classroom. Factors that encouraged participants to use the Internet were effectively engaging millennial students as well as making the Agricultural Education teacher's instruction more efficient. The most prominent suggestion participants gave for planning professional development was to focus on one Internet use at a time.

Chapter V

CONCLUSIONS AND RECOMMENDATIONS

Introduction

With the rapid advances in Internet technology made every year combined with the increasing availability of the Internet to students, it is important to continually investigate how secondary Agricultural Education teachers use and view Internet-enhanced teaching in order to effectively utilize this educational tool. Current research falls short of describing Internet use by secondary Agricultural Education teachers in Georgia and the barriers present that would hinder them from effectively enhancing their classrooms using the Internet.

The primary purpose of this study was to describe the extent and type of the use of Internet-enhanced instruction by secondary Agricultural Education teachers in Georgia. Additionally, this study sought to describe the perceived factors that encouraged or discouraged the implementation of such instruction and to provide insight into the kinds of professional development Agricultural Education teachers need in order to integrate the Internet into their instruction. The population for this study consisted of all secondary Agricultural Education teachers in Georgia (N = 466) based on the latest program update of 2017 (Georgia Agricultural Education, 2017). Some of my findings were based on 237 participants or 50.9% of Georgia Agricultural Education teachers who completed the survey titled "A Descriptive Study of Internet-enhanced Instruction in

Georgia Secondary Agricultural Education." Other findings were based on telephone interviews I conducted with eight Agricultural Education teachers who collectively possessed the demographic variables of gender, age, years of experience, community type, program level, highest degree and certification method.

Both quantitative and qualitative research methods were used to answer the five research questions. Non-parametric descriptive statistics and Multivariate Analysis of Variance tests for each variable group were used to analyze the quantitative survey data. The qualitative responses to the open-ended questions were analyzed to describe perceived factors that encouraged or discouraged the implementation of Internet-enhanced instruction as well as to determine recommendations for professional development in this area.

In this chapter the conclusions from the research are presented and discussed. Additionally, I will make recommendations for future research as well as recommendations for practice and for professional development planning. Lastly, I will make final observations regarding the study.

Research questions

The research was guided by five questions during the entire process. Based on analysis of the quantitative and qualitative data, conclusions were made in regard to each research question.

1. What is the reported extent of the use of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participated in the study?

2. What are the current uses of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participated in the study?
3. What are the demographic and perceived intrinsic and extrinsic factors and variables that encourage the use of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participated in the study?
4. What are the demographic and perceived inhibiting factors and variables that discourage the use of Internet-enhanced instructional strategies by Georgia secondary Agricultural Education teachers who participated in the study?
5. What professional development opportunities for using Internet-enhanced instructional strategies are needed by Georgia secondary Agricultural Education teachers who participated in the study?

Conclusions

The purpose of this study was to describe how Georgia Agricultural Education teachers were using the Internet to enhance learning in their classrooms and develop recommendations for professional development that would potentially enable these teachers to overcome the perceived obstacles that prevent them from using the Internet. Data describing gender, age, years of experience, community type, program level, highest degree, certification method, hours per week using the Internet, and number of Internet-connected devices were gathered based upon the current situation of the Agricultural Education teachers participating in the study.

After reviewing and analyzing the data collected from the quantitative and qualitative portions of the study, the following conclusions are reached:

1. Findings of the study reveal the demographic changes from historical derivative studies are Georgia Agricultural Education teachers are younger, balanced between male and female teachers, and still predominantly rural. Even though the average age of Georgia Agricultural Education teachers has only decreased by about 3 years of age from the study Peckham and Iverson (2000) conducted 18 years ago, there were substantially more young teachers (less than 30) and substantially fewer older teachers (41 and over) in this study than there were two decades ago. The average age of participants was 37.5 with approximately one-third 30 years of age or less, one-third 31 to 40 and one-third 41 and over. This compared to Peckham and Iverson (2000) where participants had an average age of 40.2 and had the percentages per age of 13%, 32%, and 55% respectively. Additionally, the data suggest there was a very slight shift from rural to urban and suburban programs from the study conducted. According to the demographic information collected, participating Agricultural Education teachers were fairly evenly distributed throughout the state of Georgia with approximately two-thirds (60.8%) teaching in rural schools compared to 67% rural 18 years ago (Peckham & Iverson, 2000). Furthermore, the data show that the reported male and female genders were almost even at 50.6% and 49.4% respectively. This was a major shift from Peckham and Iverson (2000) where study participants were 91% male. This is a major change in the gender makeup of Agricultural Education teachers in Georgia.
2. There has been a dramatic increase in Internet usage by Georgia Agricultural Education teachers over the last two decades. Survey results revealed that 98% of

respondents used the Internet at least one hour per week to enhance learning in their classrooms. One-third of respondents used the Internet one hour per week, one-third used it two hours per week, and one-third used it three to ten hours per week to enhance learning in their classrooms. Only six respondents reported zero hours per week. This contrasted with Peckham and Iverson (2000) whose study revealed 63% did not use the Internet at all in their educational programs and only 4% used it daily. Berge and Mulienberg (2003) reported that approximately two-thirds of all schools reported that the majority of teachers use the Internet for instructional purposes.

3. There was substantial access to Internet-connected devices in the vast majority of Georgia Agricultural Education classrooms. Most Georgia Agricultural Education teachers who participated in the study (88%) utilized Internet-connected devices inside of their own classrooms. This contrasted with Peckham and Iverson (2000) whose study revealed only 35% accessed the Internet inside their classrooms. However, in the present study, 13.7% of survey respondents had no student-accessible, Internet-connected devices in their classrooms at all. Interview participants who had an Internet-connected device for every student found it much easier to use the Internet than those with less than a classroom set of devices, which agreed with the literature that one barrier to using the Internet in the classroom was not having a sufficient number of devices that can access the Internet (Inan & Lowther, 2010; Wang, 2017).
4. There was one dominant Learning Management System (LMS) used by the vast majority of Georgia Agricultural Education teachers. Google Classroom was the

number one LMS reported in the survey and was also used by many interview participants. This aligns with the national trend that 68% of the nation's primary and secondary school students use Google education apps (Lanier, 2017).

5. Georgia Agricultural Education teachers are using the Internet to promote student engagement in the learning process. Survey results revealed the most prominent uses of the Internet by Georgia Agricultural Education teachers who participated in the study were contest preparation, record keeping, the teacher-focused lessons of a classroom presentation tool, and a communication tool, and the student-focused lesson of a research tool. Follow-up interviews revealed the primary uses were contest preparation, student assessment, record keeping, student-focused lessons, and teacher-focused lessons. Overall, results of the data from both the survey and the interviews reveal that Georgia Agriculture teachers are using the Internet in a variety of ways. However, using the Internet for student assessment was rated low in the survey but was used substantially by all interview participants. Record keeping using the Internet was not used by two of the middle school interviewees.
6. Generational differences have an impact on Internet use in Georgia Agricultural Education classrooms. Since individuals under 30 years of age are often called "digital natives" (Prensky, 2006), it stands to reason they would be more comfortable using the Internet and therefore would use the Internet more in their classrooms. Since "digital natives" have been described as "the only generation for which these new [Internet] technologies are not something they've had to adapt to. Not surprisingly, they are the most avid users" (Taylor, Doherty, Parker,

& Krishnamurthy, 2014, p. 5). This assumption was substantiated by the results of the study. Analysis revealed that respondents 40 or less years of age and those with 5 or less years of experience were significantly more likely to have acquired Internet skills as part of their undergraduate degrees than older respondents and had a significantly higher confidence in using the Internet than older, more experienced teachers. Additionally, respondents with 20 years or less experience rated their confidence using the Internet significantly higher than respondents with 21 or more years of experience. The idea that younger teachers in the "millennial" generation were more likely to use the Internet to enhance learning than either older "generation x" or "baby boomer" was further confirmed through qualitative interviews. Interview participants agreed that older teachers did not grow up with or go through college with the Internet and as such are not as comfortable using it. This finding agrees with the literature that attitudes toward technology (including the Internet) were developed before college years (Jones, et al., 2009; Tapscott, 2009; Wangemann, Lewis & Squires, 2003). Since Georgia Agricultural Education teachers over 30 who participated in the study did not have nearly as much exposure to the Internet as their under 30 counterparts, results of the study agreed with the literature.

7. Georgia Middle and High Schools' support of Internet use in Georgia Agricultural Education classrooms is highly satisfactory. Results of the survey indicated Agricultural Education teachers who participated in the study rated the general support of their school as high when it came to technical support for, access to, and promotion of using the Internet. The ratings for all the questions about school

support were higher in this study than for all similar questions in Peckham and Iverson (2000). However, several interviewees expressed their perception that academic classes often take precedence over CTAE classes when it comes to access to computer labs. Additionally, some interviewees attempted to overcome a lack of devices by letting students bring their own device [BOYD]. However, this proved ineffectual because this generally caused students to become distracted.

8. Georgia Agricultural Education teachers face a great number of barriers or challenges when it comes to using the Internet to enhance learning in their classrooms. These challenges are a lack of time, technical difficulties, lack of training and lack of Internet-connected devices. Agreeing with prior research (Muilenburg & Berg, 2003), a lack of time was a barrier to incorporating the Internet into classroom lessons. Interview participants also expressed the perception that using the Internet takes a great deal of time at the beginning. However, they also expressed the perception that once the online lessons were created, time was actually saved when planning lessons and grading assignments. Another barrier to using the Internet in the classroom was the prevalence of technical difficulties. Dependence on electronic devices and their ability to access the Internet sometimes led to wasted class time trying to get devices properly working. A whiteboard can be used without Internet access and even without electricity. When computers and other Internet-connected devices stop working, classroom instruction is often hindered or even comes to a sudden stop (Gilakjani, 2013; Korte, & Hüsing, 2007). Although 88% of survey respondents used

Internet-connected devices in their own classrooms, study results revealed that the number of devices are still inadequate for all students and not having enough Internet-connected devices for every student in one's own classroom makes integrating it into lessons more difficult. This agreed with prior research (Inan & Lowther, 2010; Wang, 2017). A lack of training in how to use the Internet was another barrier to using the Internet to enhance learning. Survey and interview results both indicated that participants learned very little of how to use the Internet during the course of their teacher preparation programs.

9. The source of learning how to use the Internet to enhance learning by Georgia Agricultural Education comes from informal learning (Merriam, Caffarella, & Baumgartner, 2007). Although study participants learned how to use the Internet to enhance classrooms from the minor sources of their students, their college course work, and professional development classes, two major sources emerged from the data. One was interaction with other faculty and staff and the other was independent learning. Respondents to the survey rated these sources of training as the two highest. Even though interaction with other faculty and staff was also mentioned by interview participants, the number one response was independent learning usually through trial and error. Self-teaching was an important method of learning how to use the Internet and requires not only training in how to accomplish it but also time to learn it.
10. Georgia Agricultural Education teachers perceived using the Internet made them a more effective educator. Utilizing the Internet in the classroom was an effective method of instruction for modern learners and it made the job of teaching easier

and more efficient. One factor that encouraged the use on the Internet to enhance learning was that it was an effective method of instruction for "digital native" learners. Study participants pointed out that most modern students prefer to use digital resources including videos, web sites, and online games over traditional physical books, pencils and paper and they like the instant feedback of self-grading quizzes and tests. Another factor that encouraged study participants to use the Internet to enhance learning was that it made the job of teaching easier and more efficient. When participants used the Internet, student work was much less likely to be lost, it allowed teachers to differentiate for students with different learning speeds, and saved the teacher time.

Recommendations for Professional Development

The findings and conclusions resulting from this study lead to the following recommendations for further research in regards to using the Internet to enhance learning in Georgia Agricultural Education classrooms. It is recommended:

1. Focus on one Internet use at a time in professional development. When state Agricultural Education staff, GACTE, or GVATA leaders plan professional development in this area, the focus of the instruction should be on one particular online resource or application using a hands-on, focused approach.
2. Since the number one source of learning by study participants on how to use the Internet was independent learning through trial and error, state staff should provide professional development in the area of how to independently learn. This will hopefully make this method of self-instruction more effective.

3. Because “digital native” students like and expect immediate feedback and because self-grading assessments save teachers a great deal of time, state staff should be encouraged to provide professional development on using the Internet for student assessment.
4. Since Google Classroom is the predominant LMS used nationwide as well as among study participants, state staff should be encouraged to provide professional development on how to use Google Classroom.
5. State Agricultural Education staff, GACTE, and GVATA leaders should be encouraged to provide professional development where several teachers experienced with using the Internet to enhance learning can demonstrate ways they have used the Internet in their own classrooms.
6. Due to its prevalence, state Agricultural Education staff should be encouraged to develop lessons and assessments for use through Google Classroom.
7. Study results revealed that older teachers with 21 or more years of experience used the Internet significantly less than younger teachers. Study participants suggested a few ways to encourage these older teachers to use the Internet that included having an open forum for Agricultural Education teachers to share ideas about using the Internet to enhance learning and starting a mentoring system. The open forum would be not only to help older teachers, but also as a less intimidating resource for all teachers to learn what works inside the classroom. Additionally, the mentoring system would allow young, Internet-savvy teachers to “show” non-Internet-savvy teachers of all ages how to use the Internet to enhance learning.

8. State staff and GVATA leaders should utilize Agricultural Education teachers who have innovative ways of using the Internet to enhance learning as professional development instructors.

Recommendations for Future Research

The findings and conclusions resulting from this study led to the following recommendations for further research regarding using the Internet to enhance learning in Agricultural Education classrooms.

1. Using the Internet for record keeping was not used by two of the middle school interviewees. Because keeping records is part of the three component model of Agricultural Education, a possible area for future research would be to more closely examine the difference between high school and middle school record keeping using the Internet.
2. Quality teacher preparation programs are important in order to properly prepare teachers to educate students using technology (Coley, et al., 2015). Because the results of this study suggest that current teacher preparation are not effectively preparing teachers to use the Internet to enhance learning, a possible area for future research would be to examine Agricultural Education preparation programs to identify particular Internet knowledge and skills for effective Internet-enhanced instruction.
3. This study was limited to Georgia Agricultural Education teachers. A nationwide study would provide better insight into the state of Internet use in Agricultural Education classrooms throughout the United States.

4. Agricultural Education includes a tremendous amount of experiential, hands-on learning. This study did not examine the effectiveness of the Internet-enhanced, classroom instruction. A possible area for future research would be to compare the effectiveness of hands-on lessons to Internet-enhanced lessons on student learning.
5. Because of its prevalence, a possible area for future research is to examine what factors make Google Classroom such a popular LMS.
6. Several study participants perceived inequity in the allocation of Internet-connected devices between CTAE and academic departments. A possible area for future research is to examine equity in access to computer labs in secondary education.
7. Explore the relationship between factors that inhibit Internet use to the time students use the Internet to enhance learning.

Final Significance

The purpose of this study was to describe the extent and type of the use of Internet-enhanced instruction, describe the perceived factors that either encourage or discourage the implementation of such instruction, and provide insight into the kinds of professional development Agricultural Education teachers in Georgia need in order to integrate the Internet into their instruction. Research Question 1 quantified the extent of use of the Internet. Research Question 2 described the types of Internet uses. Research Questions 3 and 4 identified the barriers and enablers to using the Internet. Finally, Research Question 5 described the types of professional development that were needed to implement Internet-enhanced instruction.

The Diffusion of Innovations was used as the theoretical framework to guide this study of *A Descriptive Study of Internet-enhanced Instruction in Georgia Secondary Agricultural Education*. This framework was especially appropriate for this study due to the fact that the original work Everett Rogers used to form his theory of the Diffusion of Innovations was based around farmers' adoption of new agricultural practices (Rogers, 2003). "Diffusion is the process by which an innovation is communicated" and adopted "through certain channels over time among the members of a social system" (Rogers, 2003, p. 5). The four main elements in the diffusion of innovations theory were 1) the innovation itself, 2) the communication of that innovation, 3) the time it takes for diffusion and 4) the social systems through which the innovations diffuse. For this study the innovation was the use of the Internet to enhance learning and the social system was Agricultural Education classrooms in Georgia. Since 98% of participants used the Internet to enhance learning, the results of this study revealed that in the timeline of the Diffusion of Innovations the diffusion of the Internet in Agricultural classrooms is in the "laggard" phase with only a few teachers not using the innovation. Rogers also stated that to get a new innovation adopted, "even when it has obvious advantages, is difficult (Rogers, 2003, p. 1). So this last group of laggards, those Agricultural Education teachers with 21 or more years of experience, may be difficult to convince to incorporate the Internet into their classrooms.

As stated early in this study, every individual has unique strengths, weaknesses and learning styles and the Internet may help to enhance the learning of these modern, "digital native" students currently in Agricultural Education classrooms. The statement of the problem for this study was that current research falls short of describing Internet

use by secondary Agricultural Education teachers in Georgia and the barriers present that would hinder them from effectively enhancing their classrooms using the Internet. As a result of conducting this research study, I have a much greater insight into the amount of Internet-enhanced instruction that was being utilized in Georgia Agricultural Education classrooms and the barriers that hinder its use. This study also informs state Agricultural Education leaders about the current state of Internet use by secondary Agricultural Education teachers in Georgia and the professional development these teachers need to effectively enhance learning in their classrooms.

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APPENDIX A: IRB Approval from Valdosta State University

Institutional Review Board Approval form

Institutional Review Board (IRB)
For the Protection of Human Research Participants
PROTOCOL EXEMPTION REPORT

PROTOCOL NUMBER:	03505-2017	**INVESTIGATOR:**	Mr. Walter Parks
		SUPERVISING FACULTY:	Dr. Reynaldo Martinez
PROJECT TITLE:	*A Descriptive Study of Internet-enhanced Instruction in Georgia Secondary Agricultural Education.*		

INSTITUTIONAL REVIEW BOARD DETERMINATION:

This research protocol is **Exempt** from Institutional Review Board (IRB) oversight under Exemption **Category 2.** You may begin your study immediately **(07.25.2017).** If the nature of the research project changes such that exemption criteria may no longer apply, please consult with the IRB Administrator (irb@valdosta.edu) before continuing your research.

ADDITIONAL COMMENTS:

- *The Consent statement must be read aloud to each participant at the start of interviews.*
- *Upon completion of your research study, compiled data (including – email addresses, data lists, etc.) must be securely maintained (locked file cabinet, password protected computer, etc.) for a minimum of 3 years.*

☒ *If this box is checked, please submit any documents you revise to the IRB Administrator at irb@valdosta.edu to ensure an updated record of your exemption.*

Elizabeth W. Olphie *2/18/18*
Elizabeth W. Olphie, IRB Administrator Date

Thank you for submitting an IRB application.
Please direct questions to irb@valdosta.edu or 229-259-5045.

Revised: 06.02.16

APPENDIX B: Survey Instrument

Survey of Internet-enhanced Instruction in Georgia Secondary Agricultural Education

Informed Consent

You are being asked to participate in a survey research study entitled "A Descriptive Study of Internet-enhanced Instruction in Georgia Secondary Agricultural Education," which is being conducted by Walt Parks, a student at Valdosta State University. The purpose of this study is to describe how Georgia Agriculture teachers use the Internet to enhance instruction and determine professional development needs in this area. This research study is anonymous. No one, including the researcher, will be able to associate your responses with your identity. Your participation is voluntary. You may choose not to participate, to stop responding at any time, or to skip questions that you do not want to answer. You must be at least 18 years of age to participate in this study. Your participation serves as your voluntary agreement to participate in this research project and your certification that you are 18 or older.

Questions regarding the purpose or procedures of the research should be directed to Walt Parks at wjparks@valdosta.edu or Dr. Reynaldo Martinez at rmartinez@valdosta.edu. This study has been exempted from Institutional Review Board (IRB) review in accordance with Federal regulations. The IRB, a university committee established by Federal law, is responsible for protecting the rights and welfare of research participants. If you have concerns or questions about your rights as a research participant, you may contact the IRB Administrator at 229-259-5045 or irb@valdosta.edu.

Q1. Click yes if you are 18 years are older and consent to participate in this survey.

- o Yes
- o No

Demographics

Q2.1 What Area is your school in?

- 1
- 2
- 3
- 4
- 5
- 6
- State Staff

Q2.2 How would you classify the community in which your school is located? (Check One)

- Urban
- Suburban
- Rural

Q2.3. How many total years have you been teaching in the Agricultural Education field?

_____

Q2.3-1. How many total years have you been teaching in the any field?

_____

Q2.4 What grade level(s) do you currently teach?

- 6
- 7
- 8
- 9
- 10
- 11
- 12
- Other (please describe) _____

Q2.5. What is your age?

_____

Q2.6. What is your gender?

- o Male
- o Female

Q2.7. What is the highest degree you have earned?

- o Bachelor's
- o Master's
- o Specialist (Ed.S.)
- o Doctorate
- o Other _____

Q2.8. How were you certified?

- o Traditional Baccalaureate Teacher certification program
- o Alternatively certified
- o Other (please describe) _____

Q2.9. What Agricultural Education course(s) do you teach? (Select all you teach)

- ❑ Agribusiness Management and Leadership
- ❑ Agricultural and Food Products Processing
- ❑ Agricultural Animal Production and Management
- ❑ Agricultural Mechanics Technology I
- ❑ Agricultural Mechanics Technology II
- ❑ Agricultural Metals Fabrication
- ❑ Agriculture Electricity and Electric Controls
- ❑ Agriculture Meat and Dairy Product Processing
- ❑ Animal Science and Biotechnology
- ❑ Aquaculture
- ❑ Basic Agricultural Science
- ❑ Environmental Science and Stewardship
- ❑ Equine Science
- ❑ Floral Design and Management
- ❑ Floriculture Production and Management
- ❑ Forest Science
- ❑ Forestry Science II
- ❑ General Horticulture and Plant Science
- ❑ Introduction to Renewable Energy

- ❑ Marketing Agriculture Products and Services
- ❑ Middle School 6th Grade
- ❑ Middle School 7th Grade
- ❑ Middle School 8th Grade
- ❑ Natural Resources Management
- ❑ Nursery and Landscape
- ❑ Plant Science and Biotechnology
- ❑ Renewable Fuel Production
- ❑ Small Animal Care
- ❑ Sustainable Agriculture
- ❑ Turf Production and Management
- ❑ Veterinary Science
- ❑ Wildlife Management

Q2.10. Where do your students use the Internet for activities for your class (Check all that apply)?

- ❑ At home
- ❑ In your classroom
- ❑ School Media Center
- ❑ Wireless Internet Access
- ❑ Computer Lab
- ❑ Other _____

Q2.11. If you have Internet access at school, on average how many hours each week do the students in your classes use the Internet for instructional purposes?

Q2.12. How many teachers are in your Agriculture Department?

- 1
- 2
- 3
- 4
- 5 or more

Q2.13. How many computers or devices in your classroom are Internet accessible? (not student brought) _____

Q2.14. What platform(s) are you currently using in your department for Internet activities (Select all that apply)?

- ❑ Windows PC (Desktop)
- ❑ Windows PC (Laptop)
- ❑ Windows Tablet
- ❑ Apple Desktop
- ❑ Apple Laptop
- ❑ iPad
- ❑ iPod
- ❑ Android Tablet
- ❑ Chromebook
- ❑ Smart Phones (Brought by students)
- ❑ Other _____

Q2.15. Select any Learning Management System (LMS) (Select all that apply or select

"None" if you do not use an LMS

- Blackboard
- Google Classroom
- Moodle
- Other (please list) _____
- None

Teacher Preparation and Professional Development for Internet Use

Q3.1. Select the one response that best reflects the extent to which you've acquired skills for using the Internet from the following sources.

	Not at all	Small Extent	Moderate Extent	Great Extent	Entirely
As part of your undergraduate work	○	○	○	○	○
In-service or professional development courses/Workshops	○	○	○	○	○
Independent Learning (e.g. online tutorials or books)	○	○	○	○	○
Interaction with other faculty/staff	○	○	○	○	○
Interaction with other agriculture teachers	○	○	○	○	○
Distant Learning courses	○	○	○	○	○
From my students	○	○	○	○	○

Q3.2. Other source(s) of teacher preparation or professional development (please list)

_____

Q3.3. Please list any areas for which you need professional development regarding using the Internet in your classroom

_____

Confidence and Comfort Using the Internet

Q4.1. Select the one response that best reflects your level of agreement.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I have had adequate training in using the Internet in my classroom.	○	○	○	○	○
I use the Internet effectively in my classroom.	○	○	○	○	○
I am comfortable using the Internet during my classroom instruction.	○	○	○	○	○
I am comfortable giving Internet assignments to my students.	○	○	○	○	○
Incorporating the Internet into lessons enhances my teaching.	○	○	○	○	○
My use of the Internet enhances my students' performance.	○	○	○	○	○
I am comfortable navigating the Internet.	○	○	○	○	○
I am confident that I can find answers to my students' Internet-related questions.	○	○	○	○	○
I am developing my expertise on how to use the Internet in the classroom.	○	○	○	○	○

Attitudes Toward Internet Use

Q5.1. Select the one response that best reflects your level of agreement.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I would like my students to be able to use the Internet more.	○	○	○	○	○
The ability to effectively use the Internet is essential to my students.	○	○	○	○	○
I feel tense when people start talking about the Internet.	○	○	○	○	○
I feel pressure from others to integrate the Internet into my classroom.	○	○	○	○	○
I avoid the Internet whenever possible.	○	○	○	○	○
Using the Internet in the classroom is just another fad.	○	○	○	○	○
The Internet diminishes my role as a teacher.	○	○	○	○	○
More training would increase my use of the Internet in the classroom.	○	○	○	○	○
The Internet should be incorporated into the classroom curriculum.	○	○	○	○	○
The Internet enhances classroom instruction.	○	○	○	○	○
The Internet makes my job easier.	○	○	○	○	○
Learning how to incorporate the Internet in the classroom requires a great deal of my professional time.	○	○	○	○	○

Using the Internet in the Classroom

Q6.1. Listed below are teaching methods in which the Internet may be used. Indicate how often you use the Internet in each teaching method.

	Not at all	Small extent	Moderate extent	Great extent	Entirely
Small group instruction	○	○	○	○	○
Individual instruction	○	○	○	○	○
As a reward	○	○	○	○	○
Independent learning	○	○	○	○	○
To tutor	○	○	○	○	○
To promote student-centered learning	○	○	○	○	○
As a research tool for students	○	○	○	○	○
To administer tests and quizzes	○	○	○	○	○
As a communication tool (e.g. e-mail, electronic discussion, FFA promotion)	○	○	○	○	○
As a classroom presentation tool	○	○	○	○	○
Contest (Career Development Event) preparation	○	○	○	○	○
To archive presentations or forms	○	○	○	○	○
Record keeping (Supervised Agricultural Experience) instruction	○	○	○	○	○

Q6.2. Other ways I use the Internet in my classroom (please list)

_____

General School Support

Q7.1. Select the one response that best reflects your level of agreement.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I receive a sufficient level of Internet-related support at my school.	○	○	○	○	○
The administration supports Internet-related training for teachers.	○	○	○	○	○
The administration actively encourages teachers to use the Internet in the classroom.	○	○	○	○	○
At my school, teachers have time to learn how to use the Internet in the classroom.	○	○	○	○	○
At my school, teachers share ideas about how to use the Internet in the classroom.	○	○	○	○	○
I have sufficient equipment needed in my classroom to access the Internet	○	○	○	○	○
I have sufficient, reliable Internet access in my classroom.	○	○	○	○	○
I work with colleagues who use the Internet in their classrooms.	○	○	○	○	○
I have technical support staff knowledgeable of Internet at my school.	○	○	○	○	○
The technical support staff at my school adequately assists me in problem solving and trouble shooting.	○	○	○	○	○
I have access to a computer lab with Internet capabilities.	○	○	○	○	○

My school district has an ongoing plan for staff development to help teachers use the Internet in their classrooms.	○	○	○	○	○

Q7.2. Please comment about the support you do or do not receive for using the Internet in your classroom.

_____

Q8. If you would be willing to be interviewed about this survey, please indicate so by typing in your e-mail address below. Your answers will still be anonymous and no personal information will be published. If you do not wish to be interviewed, click next to end the survey.

_____

APPENDIX C: Validation of Survey Instrument

E-mail letter to validators

Dear Sirs and Madam,

In order to obtain a doctoral degree, I am working on a dissertation titled "A Descriptive Study of Internet-enhanced Instruction in Georgia Secondary Agricultural Education." The purpose of this study is to 1) determine and describe how Georgia agriculture teachers are using the Internet to enhance learning in their classrooms, 2) what factors help or hinder them from doing so and 3) to provide insight into what professional development they need in order to use the Internet in their classrooms. A survey has been developed to use to answer these questions.

Attached you will find the draft of my survey titled "Survey of Internet-enhanced Instruction in Georgia Secondary Agricultural Education." I am asking that you examine this survey and provide me with feedback as to the clarity, readability and appropriateness of the survey for agriculture teachers in Georgia and make any suggestions for its improvement.

This survey will be given online, but I have attached a pdf copy for your use.

Thank you in advance for helping me attempt to assist Georgia agricultural educators improve their teaching strategies.

Sincerely,

Walt Parks
Bleckley County High Agriculture Instructor & FFA Advisor
Doctoral Student at Valdosta State University

Suggested revisions from former Agriculture teachers who were asked to validate survey.

Q2.2 – Add suburban
Q2.6 – Male/Female selections
Q2.12 – Choices, 1,2,3,4,5, etc.
Q2.15 – Maybe list each platform and give Y/N choice.
Q2.16 – Delete this and add to previous.
Spell out Learning Management System. Even though you do in Q2.15, when I first read the survey, it caused me to pause momentarily.
Q3.1 – Teacher Preparation and Professional Development for Internet Use
Misspelled “Extent” (Extant) on Likert scale.
Q5.1 – Attitudes Toward Internet Use
Add “in class” to first two statements.
Would the sub-topic questions benefit from being grouped positive to negative? Negative directed questions could be re-written to have positive focus and the response would indicate the level of positive or negative feedback.
Example:
I feel tense when people start talking about the internet.
I feel comfortable when people start talking about the internet.
Each of the above questions can have a determinate answer based on agree/disagree options but the second question has a “positive” spin.
They are currently mixed, but that might be intentional.
Q6.1 – Using the Internet in the Classroom
To archive presentations or forms. Is this referring to cloud based storage?
Q7.1 – General School Support
My school district has an ongoing plan for staff development on the internet.
Does the question ask about staff development conducted using the internet or staff development on the use of the internet? Consider revision.
It may be appropriate to add a question about support from state or region AG ED and/or CTAE. If you do so, you may need to modify the title of the section.

APPENDIX D: Permission to Modify and Use Existing Survey

November 22, 2016

Dr. Kristine Hogarty
4202 E. Fowler Avenue
Tampa, FL 33620

Dear Dr. Hogarty,

I am a doctoral student from Valdosta State University writing my dissertation tentatively titled "A Descriptive Study of Internet-enhanced Instruction in Georgia Secondary Agricultural Education," under the direction of my dissertation committee chaired by Dr. Reynaldo Martinez.

I would like your permission to modify and use your survey instrument titled "Perceptions of Computers & Technology" to collect data on teachers' attitudes towards Internet use in Georgia classrooms. I would like to use and print the modified survey under the following condition:

- I will use the modified survey for my research study only and will not sell or use it with any compensated activities.
- I will cite the survey in all written documents in which data collected using the modified survey is used.
- I will send my completed research study and a copy of any reports, articles, etc. that are written using the data collected with the modified survey.

If these are acceptable terms and conditions, please indicate so by signing one copy of this letter and returning it to me either through postal mail, fax or e-mail:

Walter Parks
177 Jeanne Drive
Cochran, GA 31014
Fax- 478-934-9707
e-mail – wjparks@valdosta.edu

Sincerely,

Walter J Parks

Dr. Kristine Y. Hogarty

APPENDIX E: Original Survey Instrument

PERCEPTIONS of COMPUTERS & TECHNOLOGY

Purpose: This survey is designed to gain a better understanding of how educators use technology in the classroom and their level of experience with computers. The survey includes sections addressing level of confidence, skill, support, and uses of computers and technology in teaching. Responses will be kept strictly confidential and individual responses will not be identified or reported. Your participation is voluntary.

Thank you for your time and interest.

Please tell us about yourself:

Mother's Maiden Name: _____.

Gender: Male_____ Female_____

Highest degree earned:
___ Bachelors ___ Masters
___ Specialist (Ed.S) ___ Doctorate
___ Other, please specify _____.

College: _____
Total teaching experience in years: _____
What level or levels (undergraduate, graduate, non-degree, etc.) do you currently teach:
_____
Average number of students per class: _____
How many years have you been using instructional technology? _____.
Do you have access to a multimedia classroom? _____Yes _____No
If yes, how often do you meet there? _____

PREPARATION FOR COMPUTER USE

Directions: For the following items please circle the one response that best reflects the extent to which you've acquired computer skills from the following sources.

1= not at all
2= to a small extent
3= to a moderate extent
4= to a great extent
5= entirely

As part of your undergraduate or graduate coursework	1	2	3	4	5
Workshops	1	2	3	4	5
Independent learning (e.g., online tutorials or books)	1	2	3	4	5

Interaction with other faculty / staff	1	2	3	4	5
Distance Learning courses	1	2	3	4	5

To what extent do you think the following types of computer education would be beneficial to you?

Introductory computer skills	1	2	3	4	5
Specific applications (e.g., spreadsheet, desktop publishing)	1	2	3	4	5
Specialized training on integrating technology into the classroom	1	2	3	4	5

CONFIDENCE AND COMFORT USING COMPUTERS

Directions: Please read the following statements and circle the one response that best reflects your level of agreement.

1= strongly disagree
2= disagree
3= neutral
4= agree
5= strongly agree

I have had adequate training in using computers.	1	2	3	4	5
I use computers effectively in my teaching.	1	2	3	4	5
I am comfortable giving computer assignments to my students.	1	2	3	4	5
The computer enhances my teaching.	1	2	3	4	5
I am comfortable using computers during instruction in a multimedia classroom.	1	2	3	4	5
My use of computer technology enhances student performance.	1	2	3	4	5
Incorporating multi-media into lessons enhances teaching.	1	2	3	4	5
I am comfortable with computer terminology.	1	2	3	4	5
I am developing expertise in the uses of technology in the classroom.	1	2	3	4	5

GENERAL INSTITUTIONAL SUPPORT

Directions: Please read the following items and circle the one response that best represents your level of agreement.

1= strongly disagree
2= disagree
3= neutral
4= agree
5= strongly agree

I have adequate time to learn technology skills.	1	2	3	4	5
I have sufficient access to technology.	1	2	3	4	5
I receive a sufficient level of technology related support at my university.	1	2	3	4	5
Faculty members encourage the use of technology.	1	2	3	4	5
The administration supports technology related training.	1	2	3	4	5
The administration actively encourages the use of technology in the classroom.	1	2	3	4	5
The administration actively encourages the use of technology outside the classroom.	1	2	3	4	5

TYPES OF SOFTWARE USED FOR TEACHING/FOR INCORPORATING INSTRUCTIONAL TECHNOLOGY

1= not at all
2= once a month or less

Directions: For each type of software please circle your response to indicate how often <u>you use</u> the software (on the left) and how often <u>your students</u>

1=not at all
2=once a month or less

3= once a week
4= several times a week
5= every day

use the software (on the right) to complete school related activities. If you feel an item does not apply then circle (NA).

3= once a week
4= several times a week
5= every day

My Use							My Students' Use						
1	2	3	4	5	NA	Word processors (e.g., WordPerfect, MS Word, ClarisWorks)	1	2	3	4	5	NA
1	2	3	4	5	NA	Spreadsheets (e.g., Excel, Lotus)	1	2	3	4	5	NA
1	2	3	4	5	NA	Databases (e.g., FileMaker Pro, Access)	1	2	3	4	5	NA
1	2	3	4	5	NA	Desktop publishing programs (e.g., Pagemaker, Microsoft Publisher, Printshop, Quark)	1	2	3	4	5	NA
1	2	3	4	5	NA	Presentation software (e.g., PowerPoint, Keynote, Hyperstudio)	1	2	3	4	5	NA
1	2	3	4	5	NA	Web publishing programs (e.g., FrontPage, PageMill, Dream Weaver, Claris Homepage)	1	2	3	4	5	NA
1	2	3	4	5	NA	Graphics programs (e.g., Draw & paint programs, PhotoShop, FreeHand, Illustrator)	1	2	3	4	5	NA
1	2	3	4	5	NA	Drill and practice	1	2	3	4	5	NA
1	2	3	4	5	NA	Games	1	2	3	4	5	NA
1	2	3	4	5	NA	Simulations	1	2	3	4	5	NA
1	2	3	4	5	NA	Tutorials	1	2	3	4	5	NA
1	2	3	4	5	NA	Integrated Learning Systems (e.g., WebCT, Blackboard)	1	2	3	4	5	NA
1	2	3	4	5	NA	Web browsers (e.g., Netscape Communicator, Internet Explorer)	1	2	3	4	5	NA
1	2	3	4	5	NA	Programming / authoring tools (e.g., Authorware, Director, Java, JavaScript, Visual Basic)	1	2	3	4	5	NA

INTEGRATION OF TECHNOLOGY INTO THE CLASSROOM

Directions: Listed below are teaching modes in which technology may be used. Indicate how often you use technology in each teaching mode. If you feel an item does not apply then circle (NA).

1= not at all
2= once a month or less
3= once a week
4= several times a week
5= every day

Small group instruction	1	2	3	4	5	NA
Individual instruction	1	2	3	4	5	NA
Cooperative groups	1	2	3	4	5	NA
Independent learning	1	2	3	4	5	NA
To tutor	1	2	3	4	5	NA
To promote student centered learning	1	2	3	4	5	NA
As a research tool for students	1	2	3	4	5	NA
As a problem solving/decision making tool	1	2	3	4	5	NA
As a productivity tool (to create charts, reports or other products)	1	2	3	4	5	NA
As a classroom presentation tool	1	2	3	4	5	NA

As a communication tool (e.g., email, electronic discussion)	1	2	3	4	5	NA

YOUR PERSONAL USE OF TECHNOLOGY

Directions: Please read each statement and circle the one response that best reflects the frequency of your technology use. If you feel an item does not apply then circle (NA).

1= not at all
2= once a month or less
3= once a week
4= several times a week
5= every day

For multimedia activities (e.g., CD-ROM, DVD)	1	2	3	4	5	NA
As a communication tool (e.g., email, electronic discussion)	1	2	3	4	5	NA
For fun/entertainment related activities	1	2	3	4	5	NA
As a research tool	1	2	3	4	5	NA
As a productivity tool (to create charts, reports or other products)	1	2	3	4	5	NA

TECHNICAL SUPPORT

Do you make use of the Faculty Resource Center support staff?
Yes _____ No _____
Do you make use of your College's technical support staff?
Yes _____ No _____ Don't have any in my College _____
If yes, complete this section.
If no, then skip this section and move on to the next section.

1= strongly disagree
2= disagree
3= neutral
4= agree
5= strongly agree

The technical support staff adequately assists me in problem solving and trouble shooting.	1	2	3	4	5
The technical support staff is dedicated to helping faculty.	1	2	3	4	5
I have adequate access to technical support staff.	1	2	3	4	5
I have to contact the technical support staff several times before I get assistance.	1	2	3	4	5
Our technical support staff shows me techniques to integrate computer technology into the classroom.	1	2	3	4	5

ATTITUDES TOWARDS COMPUTER USE

Directions: The following statements address general attitudes towards computer use. Please circle the one answer that best reflects your level of agreement.

1= strongly disagree
2= disagree
3= neutral
4= agree
5= strongly agree

I would like every student in my classes to have access to a computer.	1	2	3	4	5
Computer skills are essential to my students.	1	2	3	4	5
I feel tense when people start talking about computers.	1	2	3	4	5
I feel pressure from others to integrate the computer more into my classroom.	1	2	3	4	5
I would like my students to be able to use the computer more.	1	2	3	4	5
Computers are dehumanizing.	1	2	3	4	5
I avoid the computer whenever possible.	1	2	3	4	5

Computer instruction is just another fad.	1	2	3	4	5
The use of computers should be confined to computer courses.	1	2	3	4	5
I like using the computer to solve complex problems.	1	2	3	4	5
More training would increase my use of the computer in the classroom.	1	2	3	4	5
Computers diminish my role as a teacher.	1	2	3	4	5
Computers should be incorporated into the classroom curriculum.	1	2	3	4	5
Computers make my job easier.	1	2	3	4	5
Computers further the gap between students along socio-economic lines.	1	2	3	4	5
Computer skills will help me as a professional.	1	2	3	4	5
Learning computers make high demands on my professional time.	1	2	3	4	5
Computers change my role as a teacher.	1	2	3	4	5
I can help others solve computer problems.	1	2	3	4	5
Computers enhance classroom instruction.	1	2	3	4	5

APPENDIX F: E-mail Letter to Participants/Informed Consent

Subject: Your Assistance is Needed to Assess Internet Use in Agriculture Education

You are being asked to participate in a survey research study entitled "A Descriptive Study of Internet-enhanced Instruction in Georgia Secondary Agricultural Education," which is being conducted by Walt Parks, a student at Valdosta State University. The purpose of this study is to describe how Georgia Agriculture teachers use the Internet to enhance instruction and determine professional development needs in this area. This research study is anonymous. No one, including the researcher, will be able to associate your responses with your identity. Your participation is voluntary. You may choose not to participate, to stop responding at any time, or to skip questions that you do not want to answer. You must be at least 18 years of age to participate in this study. Your participation serves as your voluntary agreement to participate in this research project and your certification that you are 18 or older.

Questions regarding the purpose or procedures of the research should be directed to Walt Parks at wjparks@valdosta.edu or Dr. Reynaldo Martinez at rmartinez@valdosta.edu. This study has been exempted from Institutional Review Board (IRB) review in accordance with Federal regulations. The IRB, a university committee established by Federal law, is responsible for protecting the rights and welfare of research participants. If you have concerns or questions about your rights as a research participant, you may contact the IRB Administrator at 229-259-5045 or irb@valdosta.edu.

Survey Link
Please click the following link to begin the survey:
https://valdosta.co1.qualtrics.com/jfe/form/SV_cACg2TOuJlq3KUB

Thank you for your participation.
Walt Parks
Bleckley County High Agriculture Instructor & FFA Advisor

APPENDIX G: E-mail Letter to Telephone Interview Participants

Subject: Request for Telephone Interview

Dear (Participant Name),

I am Walt Parks, an agriculture teacher at Bleckley County High School and a graduate student at Valdosta State University.

In completing the online survey titled, "Survey of Internet-enhanced Instruction in Georgia Secondary Agricultural Education," you indicated you would be willing to be interviewed by entering your e-mail at the end of the survey. If you have changed your mind and do not wish to be interviewed, please respond as such.

However, if you are still willing to be interviewed for this study, please respond with your cell phone number and a good time to call. Your answers will still be anonymous and no personal information will be published.

Thank you in advance for your assistance with this study.

Sincerely,

Walt Parks

APPENDIX H: Interview Questionnaire

Interview Questionnaire

Date: _____

Interviewer_____

Agricultural Education Instructor (Interviewee)_____

Thank you so much for giving up your time and agreeing to be interviewed for this study. I am doing a follow-up interview to the survey you responded to titled "Survey of Internet-enhanced Instruction in Georgia Secondary Agricultural Education." I am trying to determine how extensive is the use of the Internet to enhance the classrooms of Ga Agriculture teachers, how the Internet is used, what helps or hinders teachers from using the Internet and what professional development Ag teachers need in this area.

I will be recording this interview. Is that alright with you? _____

Ice Breaker Question: First of all, what led you to become an agriculture teacher?

The data show that almost 98% of surveyed Agricultural Education teachers use the Internet to some extent to enhance learning in their classroom.

Would you agree this is representative of actual Internet usage by Georgia Agriculture Teachers to enhance learning? Why or why not?

Respondents to the survey gave a small picture of the current uses of the Internet in the classroom. They indicated high usage of the Internet by students for research and by teachers for CDE preparation, communication, presentation and record keeping.

If you do so, how do you specifically use the Internet to enhance learning in your classroom?

Survey analysis revealed that Agriculture teachers with 20 years or less teaching experience believed they used the Internet more effectively in their classrooms and have higher confidence in using the Internet than Agriculture teachers with 21 or more years of experience.

Why do you believe this is so?

What, if anything, can be done to encourage older teachers to use the Internet to enhance classroom learning?

Although 98% of surveyed teachers used the Internet to enhance learning in their classroom, analysis revealed that Agriculture teachers with 14 or fewer Internet-connected devices in their classroom believed they did not have as sufficient a number of devices in their classroom to access the Internet as those in a 1:1 school.

(Not 1:1 interviewees) What strategies have you used in your classroom to overcome a lack of Internet-connected devices when using the Internet to enhance learning?

(All interviewees)

What other factors have you found, from your own experience, can discourage the use of the Internet to enhance learning in the agricultural classroom?

Conversely, what other factors have you found, from your own experience, can encourage the use of the Internet to enhance learning in the agricultural classroom?

Survey analysis revealed that most teachers have learned how to use the Internet to enhance learning from their own independent learning and interaction with other teachers rather than from their degree work.

Where have you learned how to use the Internet to enhance learning in your classroom?

What advice or recommendations do you have for professional development so that you and other teachers may improve using the Internet to enhance the classroom?

Thank you for participating in this survey. Your responses will be valuable for the purposes of this research study.

APPENDIX I: Interview Responses

Question 1: The data show that almost 98% of surveyed Agricultural Education teachers use the Internet to some extent to enhance learning in their classroom. Would you agree this is representative of actual Internet usage by Georgia Agriculture Teachers to enhance learning? Why or why not?	
Name	**Comments**
Steve	Well, I think, in actuality 100% of us use it whether it's taking roll or grades, we all use it. Now, as far as enhancing education, if you gonna access internet for PowerPoint, I think we all use it. I use it as a teacher. I don't let my students, very rarely, use it. I use it showing videos that relate to the lesson that we are using and a lot of that is accessed through the internet, so I think 98% of teachers do use the and the other 2% might be the old school teachers that don't access the YouTube videos and things you can find on Google.
Dave	I can't say to the percentage. I know from my discussions with ag teachers that a lot of them use the internet. I use it a lot, the more familiar I've become with it over the past few years. Yeah, well let me rephrase that, I would say the 98% usage yes, now, as far as in classroom instruction I can't say yes to that, but I way probably the usage as far as ag teachers go is 98% or higher even. I don't know. From the ones that answered the survey I would say yeah. Then again, the ones that have access to the survey, it's an online survey, they are gonna be familiar with it versus some of the older teachers, and I'm one of the older teachers, they may not be as comfortable. Of what you got surveyed, it's probably right. I would say 98% is probably close. Yeah, if you take 50% of the 98% and the other 50% were 0% then you are looking at around 49% people using the internet which that very well could be true too. I feel like it's probably higher than that.
Shirley	It seems super high to me, to be honest. I definitely think that 98% of Ag teachers have to use the Internet for their programs even if it's just doing program of work or e-mail or whatever. I was wondering if like maybe they understood the question. I'm sure they did. But so using Google. Using any of the Google Apps. Using ICEV, anything like that. I think it could definitely be true. I know a bunch of ag teachers who I don't feel like use it to the extent. Maybe they use it once a month or once a week. We do it extensively here, but we're also blessed with a lot of technology as well. So I'm not sure how much it is. So if its 98% of people that use it, but yeah they said some extent maybe not exclusively.
Cassie	I do. In my classroom, I more or less give students things that would lead them to teach themselves in that way I can go around and enhance. I can work with students individually based on their learning level or style. I feel like the Internet, or technology in general, allows certain students to move at their own rate, while some of them need more of a hands-on approach. But most of them find some sort of an interface, technology-wise that allows them to learn. I definitely use it more than I don't. We have moved away from textbooks and paper. Most of the delivery of my instruction is either by some type of video or audio or reading some type of article rather than reading and answering some sort of question.
Rex	I think everybody's gotta use it because, I mean most of the contests and FFA stuff is online, so they're using it to some degree. Talking about enhancing the classroom, I'm not really sure if that is true, but I think everybody's gotta use it. Our school system is forcing us to use the Internet in everything with our classroom. Using it to enhance our classroom, but it's a good thing if you use it right. I'd say that everybody is using but probably not everybody is using it to the same degree to enhance the classroom.
Suzy	Yes, I think so, now I don't know for sure. I'm not in everybody's classroom, but I know that just in casual conversations that you have with other teachers at conference and at CDE's, you always pick up on different websites or different activities you can do with the students. I don't have any concrete evidence for that.
Payton	I would say yes. I know the ag teachers that I know are using the internet and are

	using technology to enhance their classroom on a regular basis. You talk to them and get that firsthand account of what they are doing in the classroom on a regular basis. I would agree with that, I'm not surprised by it.
Delores	When I have gone to Summer and Winter conference, there have been cutting edge technology sessions that made me feel that everyone else is in a similar state to using the Internet, if not beyond what my district is doing.

Question 2: If you do so, how do you specifically use the Internet to enhance learning in your classroom?

Name	Comment	Code
Steve	As far as CDE preparation, as much information as is on the Georgia Ag Ed website, I'd be a fool not to let them get on Internet and print that material out and study that and not just Georgia Ag Ed but Texas A&M and all those other places that we go and get out study material for our contests.	CDE
	As an ag teacher, I have five desktop computers in my classroom that set on the back wall and we will use them for middle school record books.	RC
	We listen to reasons and we use different websites and YouTube videos, so the kids learn livestock judging and how to give a set of oral reasons. They then just have to, a lot of the kids I have already show livestock, so they already have a sense of what to look for and how to place the animal, what they've got to look for is how to present that to the judges and that form of oral reasons and we get a lot of that from the internet.	TFL
Dave	I have used it for team preparation as far as getting teams ready for local. state and national contests.	CDE
	We also use the AET for record keeping.	RC
	We have a website that we use to do online testing with and that part I love. The fact that I ain't got to sit down and grade all them papers.	SA
	I started using Google Classroom.	SFL
	PowerPoints, I use YouTube a tremendous amount.	TFL
Shirley	We use Google classroom for all of our CDE teams. I use google docs for all my like AG Com, Ag marketing speeches so I can edit their document and they can edit it and it saves automatically.	CDE
	We take our tests online or most of our tests online where the kids have all of their notes online as well.	SA
	For record keeping we use the AET.	RC
	I use online notebooks for my kids and I use online through Google Classroom, Google Slides, Google Sheets like all, I'm a Google person. I use all of that, like I barely give out paper in my classroom. I could teach my entire Basic Ag class without printing out one sheet of paper. So, we definitely use it a lot. I use it a lot in the classroom and with FFA. Like our FFA minutes and agendas and everything are done through Google as well.	SFL

Cassie	Sometimes other kids like my livestock kids they use a livestock judging thing … it's called livestockjudging.com. So, it's a video of a class, 200 and something classes, and they can place the classes and it scores them immediately and it provides reasons of why that class is placed. That helps them to develop their … and seeing how reasons are developed. Another is my veterinary science kids, my floriculture kids, anything with an ID list CDE, they like to use Kahoot! and Quizlet. Things like that where they can practice identification whether it's for the terminology or the pictures of something. They wildlife kids use the audio and they listen to sounds for like birds and stuff.	CDE
	So there is a lot of different types of evaluations that I like to use for certain things with that. I really bring FFA into everything I do. I try not to teach one flat subject across the room. A lot of the kids, evaluation-wise, if they're ready, if they're FFA members, a lot of them I give them the opportunity to do the contest as their evaluation. So whatever they do at the contest is how I score them on it. Or doing a mock contest as their evaluation. There're some interactive assessments [with ICEV].	SA
	some of them [students] keep up with record books on a file	RC
	Instead of me getting up in front of the class teaching one thing, I give the students a category of something that they're interested in. So they have the choice between four subjects. Then they have assignments. Some of them utilize something such as ICEV to complete the video and then it has PowerPoint and they can work through that and then they can have activities like matching or definition-type stuff. I like to do different stuff with different kids because I have noticed that their behavior is better when I give them choice. It's like student-led, group-based type stuff, and they have objectives that they have to meet by a certain day. And they can kind of work at their own pace and they can get ahead or if they need some remediation they're good about coming to me. So it allows me to be more free to move amongst them.	SFL
Rex	A lot of the stuff we do in the classroom is based around a contest. I have a Google Classroom that for different contests that they can do and different classes. Like I have a natural resources google classroom. Mainly CDE preparation and some classroom stuff.	CDE
	With nursery landscape we learn all the plants on the list, and then we use those tests for like the 25 question tests … Sometimes I can go on there and we'll just pull tests up in class and we do that. We use Quizlet and Kahoot! and stuff like that.	SA
	I put it up on the board, cause in our classroom, we don't have any Wi-Fi connection … We mainly just do [Internet] stuff off the board.	TFL
Suzy	We use it for CDE prep, of course.	CDE

	… we use the AET for record keeping.	RC
	… with the tests and I use Quizlet quite a bit for review and for introduction of information to the students.	SA
	I actually have little worksheets that go along with the PowerPoint presentations that are on the GAAGED website, and its I think its purposefulgames.com that, that I use that to some extent as well.	SFL
	I use the Georgia Ag Ed website quite a bit for review of the parts of the animals.	TFL
Payton	We sometimes use the Internet for CDE prep in the form of Quizlet.	CDE
	We have record book Wednesday. Every Wednesday my kids have the first 15 minutes of class to update their record books using the AET.	RC
	Usually, when they finish that up [record book Wednesday] I try to have something for them to do since they've already got the computers out. I use Google Classroom to kind of fill up the rest of that class period. A lot of times with Google classroom it's them doing their own research or researching a specific topic that we're working on. My kids in Ag Mechanics do a lot of search on Pinterest on projects that they would be interested in looking at. I also do like the fact that because it is there, I feel like my kids get more out of me being gone now than what they did before when I didn't use that technology, because they can use Google Classroom and they can work on stuff just like I was there. Where in the past the only thing that I could do was, here's a book and answer these questions kind of thing.	SFL
Delores	For CDE's I use the FFA website to download materials and guidelines.	CDE
	I use Google Forms for giving tests. I require my students to keep a digital journal of their work.	SA
	We upload our SAE files to Google to share among teachers and students.	RC
	We use google classroom and we post our assignments through Google Classroom … So it's a replacement for paper ... it's easier and the students enjoy it as well so instead of just writing in a journal or doodling on paper they actually insert pictures and they look up supportive links that they share with me.	SFL

Question 2: Content Analysis		
Code	**Description**	**Frequency**
CDE	CDE (Career Development Event) Preparation	8
RC	Record Keeping	7
SA	Student Assessment	6
SFL	Student-focused Lessons	6

TFL	Teacher-focused Lessons	4

Question 3: Why do you believe Agriculture teachers with 20 years or less teaching experience have a higher confidence in using the Internet and believe they use it more effectively than those with 21 plus years of experience?	
Name	**Comment**
Steve	I learned a couple years ago that I was in a generation called the Oregon Trail generation and that's those that were born between 79 and 84 because we were the last group of students that could have graduated from a 4-year university without Facebook. I was in my senior year of college before I heard what Facebook was. I am in that between generation, but the generation before me didn't grow up with computers, ...they learned things the more i guess for a lack of better words, the old fashioned way. But now the generation coming in a few years behind me,... just the way that they had computers in their house where I didn't growing up. I guess the different way a person is raised up with, that's what they feel more comfortable with. A younger person is gonna feel more comfortable with the technology because they grew up with it, where that older teacher, even though they ain't but 10 years apart ...
Dave	Because they grew up with it. It hasn't been around that long. I have been teaching for 31 years and for less than half of my career is has been around. When I was going back to get my masters (30 years ago), (my professor) required everybody to use a computer and I thought that was stupid, but now when my computer goes down, I lose my frikin mind because everything that I deal with is dealing with a computer. In teaching class, when we use GPS and things like that and new technology, kids grasp it so much quicker than the adults do. I just think that their familiarity with it. They been using it a lot longer than the older folks have.
Shirley	Because most of those people who have 20 years or less at least have had the Internet for some portion of their life. We are almost digital natives, but we're not there yet, like we didn't start with a cell phone in our hand like my daughter who is almost 4 and can use the phone better than I can. They grew up with it, or they went through college with it, or even grad school with the Internet. So they feel more confident because they've had to use it for longer than those ag teachers with 21 or more years.
Cassie	The use of technology as we aged. I was the first generation of people with cell phones. I have had a cell phone since I was 12-ish. By the time I hit high school we used the Internet on our phones. When I taught with a man who had been teaching 42 years, and he could turn on a computer and that was about the limit of it. He was more of a stick to what I know, read the textbook and answer the questions at the end of the chapter and go from there. I do feel like more of the experienced teachers are more confident in the hands on approach. Mine learn more of the science of things but not the ability to do the hands-on things.
Rex	A lot of them are probably just set in their ways, they want to just do paper

	stuff, which I can see the benefits in that, that's how they were taught and everything. A lot of them are just kinda, that technology stuff is just so fast they just throw it at you so quick it's hard to understand it. and I am sure when you get past 20 years, you kinda just really don't care. When I came through UGA, not everything but a lot of stuff was off the internet, so we were just used to it. Everything was Internet based. But when (older teacher came through) everything wasn't that way. So you're probably just stick to your roots.
Suzy	I can speak for the ones 21 and above on the years of experience, we didn't grow up with it. This was secondary for us, and we had to learn it on our own. Whereas the younger folks coming through now, I think have grown up with it. And I am always afraid I am going to break something or get lost or go somewhere I shouldn't go. But I am getting over that now.
Payton	I'm at 18, and I feel like I am probably lumped in more closer with the 20. So technology was not a great big thing growing up and it was not something that we used every day. Younger teachers it is something that they've used every day. For a long period of time so they're more comfortable with it. I think it's easier for them to pick things up, new things, that are being introduced on a regular basis. Whereas older teachers have a harder time adopting new things, regardless of whether its technology or anything else to be honest. I have been doing it for 20 years and I am going to keep doing it.
Delores	The educational training that the teachers went through. As they themselves, technology changes so quickly, if you are not in a teaching situation where you use the new methods … then you don't really know … and you may not feel as confident using it.

Question 4: What, if anything, can be done to encourage older teachers to use the Internet to enhance classroom learning?	
Steve	I think that maybe if they were shown. Like I just got through working with a unit on woodworking with my middle school and I showed some New Yankee Workshop videos, so you can find some things that fit the style of the old ag teacher like Norm Abram on New Yankee Workshop. It's a video and kids gonna pay attention to those videos so it ain't all new technology. You can find some older resources that are available to use through the internet. Maybe they don't think about it, maybe they don't realize everything is out there on the internet. I'm not gonna say what they are doing is wrong, and that it's gonna make their classroom better. I think if they've been teaching that long, they've probably got it figured out, what works and what don't.
Dave	To be honest with you, I don't know that your gonna, you know. Old folks is stuck in their ways. Now I have had the opportunity to have somebody a lot more technologically savvy than I am to introduce me … You know I'm sort of, it's hard to believe, you know a lot of folks wouldn't believe it, but I am an, somewhat of an open-minded person towards this stuff. When I'm taught or shown something new, and I think I can use it, then I try to utilize it. A lot

	of folks, are the, “If it ain’t broke don’t fix it,” type. I know that just watching my grandkids grow up, they take to using the technology a whole lot more and they are more familiar with it and more accustomed to using it. By the time the older teachers get to where they are using it, guess what, they are no longer gonna be older teachers. They are gonna be retired teachers, so I don’t know that we should spend a whole lot of time worrying about the old teachers than we should be preparing the younger ones and the newer ones for it. They not gonna teach 50 and 60 years. When they hit thirty or whatever they’re gonna start retiring and finding something else to do.
Shirley	I think you really just have to take one step at a time. A lot of times at professional development or even at school or one of our conferences like GVATA or NAAE, they might throw so much stuff at you at one time and you feel like you have to implement everything. If you had one thing, you are going to learn how to use Google Docs this year or this semester and just have small incrementing goals for those teachers. Maybe having a team of ag teachers who are confident with it to teach it to them or mentor them which ultimately sounds like more work, but if they are going to do it, it’d be nice to be like, “Oh, I can call up Mr. [REDACTED], and he’s the Google guru,” or whatever. Not those, “You need to do this, this, and this.”
Cassie	Really showing them where some people are having success in it, how they can implement it and, you know, bridge the gap between that generation that they are teaching and that generation that they are from. So maybe, you know, lead by example, hands-on learning, you know, let them. The professional development is what it's gonna come down to, teaching them how to do things
Rex	All these classes we go to at our school, they just kind of throw three or four programs at you at one time, and not really sit on one and show you how to use one. I guess like if you had older teachers and just showed them how to use one thing and was very deliberate with it and just talked real good, I guess maybe like a one on one, I guess it would kind of help. If you have a bunch of older teachers in a room and you're a big shot and throwing all these big words and technology stuff around, they probably just not gonna listen to you.
Suzy	I think staff development, and hands-on staff development, not just a “go in and listen to it”. I think we need to get in and actually do it. We do learn by doing. Personally, that works best for me. Just getting over the fear of trying not to mess up and lost and not being embarrassed in front of the students. A lot of times, the smarter students will show me what to do, a lot of times. I do think staff development, that’s the only way that we are gonna get over it.
Payton	It’s just like anything else. You are going to have to show them the value of it and the benefit of it before they consider using it. And, you are probably going to have to do some professional development on it, and I really believe the professional development needs to be geared toward the amount of technological use the teacher has. The older teacher is going to need more help than the younger teacher and if you put them all in the same group the older teachers are gonna get lost in the shuffle, so to speak, and that’s gonna

	turn them off to using it even more.
Delores	Well, one thing I mentioned before; I can think of a couple of breakout sessions at conventions and conferences, that sort of thing, where that has been offered and I do think it's very useful. That would be a setting where teachers would feel more comfortable learning something with their peers. When there are these options and you are there to learn then I think that would be a good time to share that. Part of me misses the paper journal. Sometimes I just want to say, "You are on your computer in all your other classes, in mine we just aren't gonna open it." There's part of me that want to do that and I am an older teacher. I don't have that much experience teaching Ag Ed, but it could be personal preference and I do think that might come with age.

Question 5: What strategies have you used in your classroom to overcome a lack of Internet-connected devices when using the Internet to enhance learning?		
Name	**Comment**	**Code**
Steve	We could use the computer lab on the other side of campus, so it takes time to get over there.	OCL
Dave	We book the computer lab when we can book it. Our school system doesn't have the facilities or the equipment. We got 750 students and two computer labs for the entire school.	OCL
Cassie	We have a computer lab across the hall.	OCL
	I allow kids to bring their own devices.	BYOD
Rex	Every once in a while we go to the computer lab, … Sometimes we go to the computer lab and somebody else is already in there.	OCL
	We try to use what we can. We are kinda down in a hole and the Wi-Fi is terrible. We tried to do Kahoot and only about six people can connect at a time.	BYOD
Shirley	Before we were 1:1 at or school … we would use phones.	BYOD
Suzy	A lot of times I let them use their phones unless we are typing something out. And a lot of times they can get to a website faster on their phones than they can on the desktops.	BYOD

Question 5: Content Analysis		
Code	**Description**	**Frequency**
OCL	Outside of class Computer Laboratory	4
BYOD	Bring Your Own Device	4

Question 6: What other factors have you found, from your own experience, can discourage the use of the Internet to enhance learning in the agricultural classroom?		
Name	**Comment**	**Code**

Steve	They are inundated so much with technology, when they come to my class, I'm gonna give them a reprieve from technology.	HOL
Dave	The damn things not working. If you go in there (the computer lab) and you got everything planned out nice and neat and then somebody has a computer problem, well that screws the whole thing up. One person's computer screws up then that screws everybody else up. If you go in there (lab) with a 50-minute class period and you spend 30 minutes trying to get the damn computers working, then you just wasted half a day and really haven't accomplished anything.	TD
	Having the time to get the stuff uploaded or put on the Internet or whatever. Google classroom is a great thing but somebody has gotta put that stuff on there.	TIME
Shirley	Technical issues with devices.	TD
	Easier to use paper if you don't have the capability to monitor student activity. We take our tests online, all their notes are online, so cheating is a problem.	UQ
Cassie	If the Internet does down...the ability to get stuff done when it goes down. You have to have a backup plan.	TD
	I think the social media thing, um, it can be limiting if you have, if you're in a sense where you have to do BYOD then your gonna have people on their own phones, so I think that that aspect is a disservice in the classroom.	SD
Rex	A lot of times … they get out their phones and stuff to do the Kahoot and a lotta times they just play around. They [the school] want them [students] to use their technology, to me it's more a hindrance of trying to keep your classroom under control if they are out there playing on their phones all the time, and you gotta constantly monitor em if you're doing one of those if they are on their phones to make sure if they are actually doing what you told them to do.	SD
Suzy	I probably say 500 times a day, put your phones up. I call them pacifiers.	SD
	The websites change year to year and even month to month. For instance, the University of Kentucky had a wonderful website for learning activities and it just went away. You have to go in and check before you actually teach the class. Sometimes it is difficult for the students to actually get to the part of the website that we want them to be. We think that sometimes that students are very proficient on the Internet. Well I have found that they are really not. They know how to get to their part of that but as far as researching and finding particular websites that are credible. That is a struggle for them.	UQ
Payton	The biggest problem for me is finding the time to become familiar with something new. They have made me lead instructional teacher in my school for everybody in Career Tech and Ag Ed. And you can show people a million times to do something but until they take the	TIME

	time to sit down and work with it and do it themselves and really figure it out on their own they're not gonna adopt it. So if they don't have the time, they are not gonna do something new. So finding that time is probably in my opinion the biggest hurdle to overcome.	
Delores	So, our students immediately play games. Once they are given, it is like opening Pandora's box. So it has been almost as quickly as providing it. The district has to come up with ways to block or control what the student sees. I put up a timer for them to write down their starters. My administrators look at which students are off task, so I could be reprimanded if my students are off task, so I really limit the amount of time that we spend on the Internet.	SD

Question 6: Content Analysis		
Code	**Description**	**Frequency**
SD	Student Distraction	4
TD	Technical Difficulties	3
TIME	Excessive Time	2
HOL	Hands-on Learning	2
UQ	Unique Responses	2

Question 7: What other factors have you found, from your own experience, can encourage the use of the Internet to enhance learning in the agricultural classroom?		
Name	**Comment**	**Code**
Steve	I seen this at the FFA day at the fair rally, when that guy was speaking … Those kids didn't pay him very much attention. But when he put that YouTube video *of him speaking*, it was a dead quiet and them kids was honed in on that video. And it was the same guy, same message, but it was just in a different form. And when the video quit and when he went back to talking they went right back to what they were doing. They weren't paying attention. And I was like oh my Lord. These kids will not listen to a live man but you give em a YouTube video and they are honed in on it. So, I find YouTube videos and I let em watch that instead of me telling it to em, they'll watch that video for some reason. And that's just that generation.	EMS
Dave	The year my father passed away, we were preparing for a state contest. And it wasn't where I could be with my team to get ready for the test material. But I already had test material uploaded. And they basically studied and trained with themselves with the stuff that I had online and then they went on and won state got to go to national with it. that showed me this would work. I can stand in my classroom and explain all day long how to do something, but if I can throw a YouTube video that does the same thing that I am doing, For some reason it clicks with them then, versus me standing there and telling	EMS

	them over and over again.	
	We have an online program that we use online testing with. That part I love, that I ain't got to sit down and grade all them papers, you know.	TEE
Shirley	Anything that can make an ag teachers life easier. So if I know I can print a report for all of the journal hours from my kids on the AET, instead of going in individually into each one of them or opening up a record book, the paper record book, and having to go through each of those for all 90 of my kids, I'm gonna do it the easier way because I already don't have enough time. So, the reason I do internet and Google stuff is: one, I have access to it all the time, I can take my computer home or I was in Nashville all last week for NAAE, I can do work and I don't lose papers and if a kid says, "Oh, I lost my paper," I'm like no, you can't lose it, it's online. It makes my life easier, it makes my life easier with parents when parents have complaints and I can say, "Here's a screenshot of what your kid did," it helps me and makes my life much easier. I don't have as much paperwork to deal with. I still have papers, but they are all digital, so it makes my life easier and I save time when I'm doing grading and stuff and if anything, that encourages me to the T. Cause anything that makes life easier is what I need.	TEE
Cassie	I have a very wide variety of students, some learn at a slower rate and they just need more time, and then you got your other kids that are I needs something else, I need something else, I'm done, and many of my students work at a slower rate than others, while some get finished quicker and ask, so I try to give assignments. The use of the Internet they can work on stuff at home, that they cannot finish in class. These kids would rather do something using technology than on paper. They hate writing. They are way faster at typing than writing. They feel like they can get more done. If they get done with their stuff you can reward them with, they love to play games. The competitiveness with Kahoot! and Quizlet. The instant gratification of scores. Those things the kids feel more success than waiting on me to grade something.	EMS
Rex	Seeing how well it can work. Just with a few Kahoot!s we have done. It helps out. They have a good time. They enjoy the class. So it can be a positive and beneficial thing if it works.	EMS
	If you can use Google classroom stuff and know how to use it and put the time in, it really makes things a whole lot easier, but it's a lot of work in the front, but the rewards are pretty good.	TEE
Suzy	The review activities on Quizlet and the GAAGED site... I can't run off enough papers to keep them busy to review. Its instant gratification, its graphics that a worksheet does not provide. I think it just does a better job.	EMS

Payton	As soon as they see the what the value is and the benefit is to the kids and to them.	EMS
	That was one of the main reasons for instance that I started using the AET. I looked at how much time it was going to save us when it came to proficiency awards and degree applications and things of that nature. That benefit to me was huge because it saved a lot of my time. Now at the same time, I had to rearrange some things and do some things differently to make that work, but long term it really does save me a lot of time.	TEE
Delores	I can share my entire lesson with the students on Google classroom and they can follow along with me, they actually come up with supporting information that teaches me.	EMS
	It is easy for me to check their work. If they share it with me, it is mine too. Almost like a virtual reality you have going on with the student. Correspond on their documents and presentations, that you might not have the chance to do in class. As a middle school teacher, I have 500 students over the course of the year, so if I were actually looking at papers, I don't think I would do that as frequently. My first year I took big boxes of student notebooks home. This has made it easier. I have a website that does make it easier, if a parent has a question about the SAE to have it all on your website. They can access that at home, and click on a link and get an example and get the instructions and get the form. For me it's a more practical thing.	TEE

Question 7: Content Analysis		
Code	**Description**	**Frequency**
EMS	Effectively Engaged Millennial Students	7
TEE	Made Teacher more Easier and more Efficient	5

Question 8: Where have you learned how to use the Internet to enhance learning in your classroom?		
Name	**Comment**	**Code**
Steve	When I went to UGA Tifton campus and during the time I was there … every student at UGA Tifton got a laptop and it was our laptop and I kept it for 2 years and when I graduated I had so many days to turn it back in and during those 2 years is when I learned how to use a computer. Just having one and doing those things those 2 years at UGA is what really help me and then when I went for my master's program, everything was online through the Horizon Wimba platform and you had to learn to type, how to login, how to download and do all those things so that's my extent of technology as far as computer and that's where I learned it from.	CW
Dave	Trial and error …	IL

	… and from people that I worked with that knew how to use technology.	OT
Shirley	The internet that I use in the classroom, most of it is independent learning or professional development through my school … but all the stuff I use in the classroom has really been self-taught or in PD.	IL
	The internet that I use in the classroom, most of it is independent learning or professional development through my school. So, like some of the stuff I do on Google Classroom was professional development and tinkering around. I think people my age and younger feel more comfortable playing around with it and figuring it out, rather than being overwhelmed by going on and trying to figure it out on your own. … but all the stuff I use in the classroom has really been self-taught or in PD.	PD
Cassie	I'm going to say a lot of it through my coursework really we, I did have personal experiences using computers and stuff …	CW
	I don't know if it matters or not but if anybody else is like me they're going to get on something like communities of practice and ask alright what are you doing or one of these Facebook share groups for Ag like the an Ag discussion or whatever I think that's one thing where we learn a lot from people technology-wise	OT
	I feel like the technology in my program was very behind so I definitely had to learn on my own through my college coursework of doing stuff at … I don't really spend a lot of time with other people cause I just don't have any around me to resource like that so I've had to figure it out on my own or Google it.	IL
	I've learned a lot through taking courses, professional development courses that has been one instance that I've learned a good bit.	PD
Rex	A lot of stuff in these past 3 years as teaching, I've done on my own… I've done a lot of investigation on my own to try to learn. That's probably the most beneficial, doing my own thing. I work better when I focus myself and try to do it myself.	IL
	I learned the basic stuff in High School and then in college, most everything we did was Internet stuff.	CW
	… and then going to PLU's …	PD
	… and talking to other teachers	OT
Suzy	Probably more from teacher interaction and sitting around underneath the oak trees at the camp …	OT
	… trial and error …	IL
	staff development	PD
	and just the kids the kids will find a lot of things and you know when you send them on a wild goose chase it's amazing what they'll find searching for something else and they'll find activities, that's the way we found that purposefulgames.com because the University of Kentucky site was not there anymore. So I said let's just Google some games and see what we can find and one of the students found that … as a teacher you don't want to be out of control for you	S

	classroom like that but sometimes you got to let go of the reins a little bit and let them see what they can find and help you find it cuz I certainly don't have time to sit there go through all those websites and look to see what works …	
	… to some degree my graduate work kind of forced me to look at ways to research and do some things online as far as online communications and that kind of thing. So that has been helpful but I didn't per say a have a class that taught you how to do things on the internet.	CW
Payton	Trial and error and doing it on my own, that's pretty much it … and then I go back and look into it and research it myself.	IL
	Or I talk to a younger teacher, usually. I get to talking with them about something, they've done in class and what's worked for them … And then there's some things that folks in my school system are the same way we got some folks that are really good about using technology in the classroom and I talked to them about how they use it and what they do we did.	OT
	When we were going through the stem program through the stem Grant. That was one of the requirements of the grant was that we got professional development on using technology and I don't know if that wasn't so much of a springboard for me because doing that I learned to do different things and saw how well it worked and how easy it worked so I started implementing other things after that.	PD
Delores	I have learned trial by fire in that we have been required to use this and required to use that.	IL
	We have rotating sessions, where we are taught different things by either the media specialist or it could be a district IT person that comes in. But I must say that typically I do not use those things until I realize that my peers are all using that.	PD
	I have learned from other teachers and the media specialist.	OT

Question 8: Content Analysis		
Code	**Description**	**Frequency**
IL	Independent Learning	7
OT	Other Teachers	6
PD	Professional Development	6
CW	Course Work	4
S	Students	1

Question 9: What advice or recommendations do you have for professional development so that you and other teachers may improve using the Internet to enhance the classroom?		
Name	**Comment**	**Code**

Steve	If you've got a teacher who is really technological or tech savvy, if you've got somebody that knows those websites and knows those things. … If someone is on the edge of thing, if they way they think is different, and they can say, these websites and these lesson plans and these videos. I may not have ever realized that they are out there … If you get some of those good teachers that's technological and they can teach me because I'm not even going to look unless somebody says, "Here it is." I never even thought to look there. I'm comfortable with what I do	MP
	Like a share session and you don't want a free for all, but if you've got four or five teachers leading a group and they are all sharing amongst themselves and then the audience is listening, I think that works better than 30 teachers in there with an opinion session …	RTD
Dave	AET updates. If teachers saw how it works. I'll be honest with you. If the teachers saw how Exam View Pro worked they...	SIT
Shirley	I think the mentor thing. It's good to have someone they can call on and ask an expert and not feel like they are taking away their time or annoying somebody,	MP
	Sometimes people feel like they can't talk to state staff about questions because they are not gonna share or whatever, but if we made it an open forum …	OF
	I know I love going to professional development. I'm probably the only person who does love going to professional development stuff, but if we had more simplified things, because I know I've talked about Google Classroom and online notebooks and it goes way over the head of some people, you know, who don't know how to use the Internet at all. If they came to my session they'd be super overwhelmed, but if you started really simply with the AET, or how to get your kids started in the AET or rather than going crazy with all the financial records or all this crazy stuff that I don't even understand on the AET.	FOUT
Cassie	During teacher's conference do some breakout sessions. Not what they are doing in the classroom, but some really, show the steps of it.	FOUT
Rex	That was my biggest thing. Just focus on one thing and show you how to use one thing instead of having like throwing three different things at one time because like I said I went to a PLU last year and they showed us how to use Kahoot! and I think everybody in their knew how to use it after that because that's pretty simple and we learned how to use it instead of them just throwing it at us assuming we knew how to use it and then going on to something else …	FOUT
Suzy	Well, they have touched on it a little in the past, and I haven't really got into it, but the Google Classroom, I know some teachers use that and they've hit and missed with it at mid-winter conference and at summer conference.	SIT

Payton	As far as design of professional development, I think it needs to start small, so you start with one thing and figure out how you can add to that one thing. Or add to one class and then over the period of the next year add to another class. It's something that involves continuous growth and development. As far as designing, from a teacher's perspective, I think you've got to find something simple to start with, something with a big payoff, as far as the benefits go to the teacher and the students. Starting off with something like that and then allowing the teacher to find other things that they want to use from there is the probably the best way to go …	FOUT
Delores	All I know is Google Classroom, because that's what our district uses, so maybe if there were other districts out there that use something different, that would be helpful, like learning different ways to use technology, because I feel like I'm kind of one-dimensional.	SIT

Question 9: Content Analysis		
Code	**Description**	**Frequency**
FOUT	Focus on One Use at a Time	4
SIT	Specific Internet Technologies	3
MP	Mentoring Program	2
OF	Open Forum	1
RTD	Round Table Discussion	1

APPENDIX J: Interview Transcripts

STEVE INTERVIEW

I: Alright, I appreciate you giving up your time to be interviewed for this study. If you remember, you filled out a survey a while back that was called, Survey of Internet-enhanced Instruction in Georgia Secondary Agricultural Education. I am trying to determine how extensive is the use of the Internet to enhance the classrooms of Ga Agriculture teacher, how the Internet is used, what helps or hinders teachers from using the internet and what professional development ag teachers need in this area. You are kinda one of the ones who didn't use it so that's going to be your focus. The data shows that almost 98% of survey Agricultural education teachers use the internet to some extent to enhance learning in their classroom. Would you agree that this is representative of actual internet usage by Georgia ag teachers to enhance learning? Why or why not?
P: Well, I think, in actuality 100% of us use it whether it's taking roll or grades, we all use it. Now, as far as enhancing education, if you gonna access internet for PowerPoint, I think we all use it. I use it as a teacher. I don't let my students, very rarely, use it. I use it showing videos that relate to the lesson that we are using and alot of that is accessed through the internet, so I think 98% of teachers do use the and the other 2% might be the old school teachers that don't access the YouTube videos and things you can find on Google.
I: Respondents to the survey gave a small picture of the current uses of the internet in the classroom. They indicated high usage of the internet by students for research and by teacher for CDE preparation, communication, presentation and record keeping. If you do so, how do you specifically use the internet to enhance learning in your classroom?
P: I suppose I assumed when I read your question, we were talking about within a bell to bell schedule of a classroom setting. As an ag teacher, I have five desktop computers in my classroom that set on the back wall and we will use them for middle school record books. We download the record book from the internet and then they save it and use it on the computer. We do print things out. We do livestock judging as far as those types of things online resources. As a teacher, I use it like I stated before, as far as my lesson plan. Very rarely, and I haven't in the last year and a half, taken my classes to a computer lab, sit in a computer lab, and give them an assignment on a computer to do as part of our lesson. As far as CDE preparation, as much information as is on the Georgia Ag Ed website, I'd be a fool not to let them get on internet and print that material out and study that and not just Georgia Ag Ed but Texas A&M and all those other places that we go and get out study material for our contests?
I: Do y'all use livestockjudging.com?
P: I can't figure out their method of judging livestock. I've looked at them, my kids have looked at them and me and my kids have picked the animals the same and we would be completely backwards from what livestockjudging.com said was the way. I know that these fads and fashions change, but I don't know how old those videos are. We use them for terminology. We listen to reasons and we use different websites and YouTube videos, so the kids learn livestock judging and how to give a set of oral reasons. They then just have to, a lot of the kids I have already show livestock, so they already have a sense of what to look for and how to place the animal, what they've got to look for is how to present that to the judges and that form of oral reasons and we get a lot of that from the internet.

I: Survey reveals that ag teachers with 20 years or less teaching experience believed they used the Internet more effectively in their classroom and have a higher confidence in using the internet than ag teachers with 21 or more years of experience. Why do you believe this is so?
P: Well, I learned a couple of years ago, that I was in a generation called the Oregon Trail Generation and that's those born between '79 and '84. We were the last group of students that could graduate from a four-year university without Facebook. I was in my senior year of college before I even heard what Facebook was. But, everybody behind me, that's all they've ever known. I'm in a between generation, the generation before me didn't grow up with computers, they learned things, for a less of a better word, the old-fashioned way. Now, the generation that came a few years behind me, not that I'm older than they are, but they grew up with computers in their house where I didn't growing up. So, I guess the things a person is raised with, that's what they feel more comfortable with. A younger person is going to feel a lot more comfortable with the technology cause they grew up with it, where that older teacher, even though he isn't but 10 years apart and you know as well as I do the difference in technology in … I graduated from high school in 2001, from 2000 to now, the amount of technology used in schools has just exploded and I think it's just because of the availability of it for people. They feel more comfortable because that's what they grew up with.
I: That's true. Well, what, if anything, can be done to encourage older teachers to use the internet to enhance classroom learning?
P: I think that maybe if they were shown like I just got through working with a unit on woodworking with my middle school and I showed some New Yankee Workshop videos, so you can find some things that fit the style of the old ag teacher like Norm Abram on New Yankee Workshop. It's a video and kids gonna pay attention to those videos so it ain't all new technology. You can find some older resources that are available to use through the internet. Maybe they don't think about it, maybe they don't realize everything is out there on the internet. I'm not gonna say what they are doing is wrong, and that it's gonna make their classroom better. I think if they've been teaching that long, they've probably got it figured out, what works and what don't. I have seen this at the region rally, well not the region rally, but he FFA Day at the Fair rally, when that guy was speaking, I think you were there and you probably noticed it, those kids didn't pay him very much attention. When he put that YouTube video of him speaking, it was dead quiet and them kids was honed in on that video. Same guy, same message, but when that video quit and he went back to talking, they went right back to what they were doing, they weren't paying attention, and I was like, "Oh my lord, these kids won't listen to a live man, but give them a YouTube video and they are honed in on it." So, I find YouTube videos and I let them watch that instead of me telling it to them, they'll watch that video for some reason. And, that's just that generation. You probably noticed it.
I: Oh yeah, I teach 8th grade as well and when we go over how to tie a tie, I try to tell them a little bit, but then I show them a video of a guy on YouTube doing it and they listen to that way better.
P: Oh yeah, and it's like they are glued to it cause that's what they grew up doing, watching YouTube videos. One of the reasons I get away from technology is because every class has Chrome Books, every class has computers; they are inundated so much with technology that when they come to my class, I'm gonna give them a reprieve from

technology. That's one of the reasons I don't use it because they get so much everywhere else. They don't know how to operate without it.
I: Going back to that, how many computers do you have in your classroom? You said you have five?
P: I have five desktops that I consider for the kids to use and I have a laptop that goes and comes when I come and go. It's the school's computer, but it's mine to use. So, I have six total.
I: The survey shows that those teachers with 14 or fewer Internet-connected devices in their classroom believed they did not have as sufficient a number of devices in their classroom to access the internet as those in a 1:1 school. What factors have you found, from your own experience, that discourage you from allowing the use of internet-enhanced learning in your classroom? You kind of alluded to that because they are inundated with technology, but what else?
P: When I was at [REDACTED] High School, we had a computer lab right across the hall and it was considered the ag computer lab, it was just for the ag classes and it was where you had a classroom set of desktops. We'd go in there from time to time, if we were working on proficiencies because I was dealing with high school kids. You'd go in there and say you were gonna let them build a PowerPoint, in wildlife management, each kid gets an animal, or a species or something and then they are going to build a PowerPoint. What I have found is it's just copy/paste, and they present this PowerPoint and they have these big words up there and they don't know what they mean. I had a kid one time, I told him if you put a word on there; I'm going to expect you to know what it means. I don't remember the animal, but it said he was an opportunistic omnivore. So, I stopped him and I asked him, "What is an opportunistic omnivore?" He had no clue. So, you go in there and you make those PowerPoints and presentations or whatever and a lot of times it's just a copy/paste thing. I have never seen the benefit or purpose of using that. As far as record keeping and all that, I completely agree that you need to use the computers for that purpose.
I: What factors have you found, in your own experience, can encourage the use of the internet to enhance learning in the ag classroom?
P: It would be hard for me to use my classroom's five computers to teach a lesson, just because I don't have enough computers for everybody to use one. Maybe if you had a higher rate of unit per student, maybe 1:1 or 2:1 kind of thing where they can be in groups and work on things, no doubt that would have to help in allowing you to use computers for your students. We could go to a computer lab across the campus, but then you gotta get everybody over there, get everybody back sort of a thing. It's not real conducive for 8th graders. I wouldn't use it on a regular basis, I'm not against it, it's just that I only have five in my classroom, so we very rarely use it. I would think the more units you have, it would be easier for that teacher to incorporate that in with their lesson.
I: Can you think of anything else that might encourage it other than just having more devices?
P: A lot of times, I think we are comfortable with what we know. My mama bought a computer when I was 18. That's the first one we had in our home. I grew up in school and we had them. We'd go to the computer lab and other things, but I wasn't very technological. We didn't play video games, we didn't do those things growing up, it's just what we did in our house. I think whatever a person is comfortable with is which

way they lean. Not that I'm uncomfortable with computers, because I can operate them and do those things, the basic things that I need to do. If we can make more teachers feel more comfortable, even those older teachers that don't incorporate, it's not just the kids using it, but them using it, in their lessons as just a way of differentiated instruction so that it's not the student just listening to the teacher talk for 60 minutes. You talk for ten and play a ten-minute clip, then you talk for ten minutes then you do something else, so you break up your instruction so it's not just the teacher talking. Breakout sessions at some of the teacher's meetings, maybe a five-minute clip on, "Here's something to use in your classroom," or "Here's a website," or "Here's a search engine," or something.
I: Well, since you are on that, what advice or recommendations do you have for professional development so that you and other teachers may improve using the internet to enhance the classroom?
P: If you've got a teacher who is really technological or tech savvy, if you've got somebody that knows those websites and knows those things … I know I get comfortable, it's my routine, if it worked last year, then it's gonna work this year. If someone is on the edge of thing, if they way they think is different, and they can say, these websites and these lesson plans and these videos … I may not have ever realized that they are out there but if you get a younger person, or maybe a person that's been teaching that's just technologically minded and they … like a share session and you don't want a free for all, but if you've got four or five teachers leading a group and they are all sharing amongst themselves and then the audience is listening, I think that works better than 30 teachers in there with an opinion session. If you get some of those good teachers that's technological and they can teach me because I'm not even going to look unless somebody says, "Here it is." I never even thought to look there. I'm comfortable with what I do, and I realized when I was working on my masters, that I'm in that lager group, I'm one that kinda holds back. I ain't in the forefront of technology. I kinda hold back and wait. I guess I'm too old for my age or whatever they say. [laughing]
I: The last question I have for you is that teachers learned how to use the internet from their own independent learning and interaction with other teachers rather than form their degree work. Where have you learned how to use the internet in your classroom?
P: When I went to UGA Tifton campus and during the time I was there, and they don't do it anymore, but during the time I was there every student at UGA Tifton got a laptop and it was our laptop and I kept it for 2 years and when I graduated I had so many days to turn it back in and during those 2 years is when I learned how to use a computer. All my professors gave a CD with the notes on it and you had to download it and pass it to the next guy. We used Horizon Wimba which was a platform where you log in and you were in class online. Just having one and doing those things those 2 years at UGA is what really help me and then when I went for my master's program, everything was online through the Horizon Wimba platform and you had to learn to type, how to login, how to download and do all those things so that's my extent of technology as far as computer and that's where I learned it from.
I: Well, I thank you for participating in this study, thank you for giving up your time. I hope you have a good new year.
P: You are welcome and I'll see you in a couple weeks at mid-winter.

DAVE INTERVIEW

I: How are you?
P: All right. You good?
I: Yeah, alrighty, I'll be recording this interview. Is that ok with you?
P: Yeah
I: Mr. [REDACTED], thank you for giving up your time and agreeing to be interviewed for this study. I am doing a follow up interview on the survey you responded to entitled, "Survey of Internet-enhanced Instruction in Georgia Secondary Agricultural Education. I'm trying to determine how extensive the use of the internet to enhance the classroom of Georgia ag teachers; how the internet is used and what helps or hinders teachers from using the internet. The survey data show that almost 98% of ag teacher in Georgia, at least to some extent, use the internet to enhance learning. Would you agree that this is representative of actual internet usage?
P: I can't say to the percentage. I know from my discussions with ag teachers that a lot of them use the internet. I use it a lot, the more familiar I've become with it over the past few years.
I: So, you think that's pretty accurate representation?
P: Yeah, well let me rephrase that, I would say the 98% usage yes, now, as far as in classroom instruction I can't say yes to that, but I way probably the usage as far as ag teachers go is 98% or higher even.
I: Now, the survey was talking about student usage to enhance learning. Students, not just the teacher.
P: I don't know. From the ones that answered the survey I would say yeah. Then again, the ones that have access to the survey, it's an online survey, they are gonna be familiar with it versus some of the older teachers, and I'm one of the older teachers, they may not be as comfortable. Of what you got surveyed, it's probably right. I would say 98% is probably close.
I: Keep in mind, we only had 50% return rate so …
P: Yeah, if you take 50% of the 98% and the other 50% were 0% then you are looking at around 49% people using the internet which that very well could be true too. I feel like it's probably higher than that. When I first started teaching there was not an Internet. And, realistically it hasn't been, honest to gosh, the past 14 years that it's started coming up.
I: Now, the respondents to the survey, they gave a small picture of what they are currently using the internet for in the classroom. They gave a higher usage by teachers for research and CDE preparation, presentation and record keeping. If you do so, how do you specifically use the internet in your classroom.
P: PowerPoints, prep and I use YouTube a tremendous amount. I started using Google Classroom. We have an online program that we use online testing with. That part I love, that I ain't got to sit down and grade all them papers, you know. That's some of the ways that I use the internet. I've used it for team preparation, as far as getting teams ready for local, state and national contests.
I: Ok, Survey analysis reveals that ag teachers with 20 years or less use the internet more effectively and had a higher confidence than those teachers with 21 years or more experience. Why do you believe this is so?

P: Because they grew up with it. Basically, it hasn't been around that long. I've been teaching for 31 years and half of my career it has been around. So, that's one of the things me and Iverson went round and round about when I was going back to get my masters, he required everyone to use a computer and I thought that was stupid and I now when my computer goes down I lose my fricking mind. Everything that I deal with is dealing with the computer. It's one of those things, in teaching class and we use GPS stuff and things like that and new technology. Kids grasp it so much more quickly than the adults do. I just think that their familiarity with it, they've been using it a lot longer than what the older folks have.
I: What if anything can be done to encourage the older teachers to use internet enhanced learning?
P: To be honest with you, I don't know that your gonna, you know … Old folks is stuck in their ways. Now I have had the opportunity to have somebody a lot more technologically savvy than I am to introduce me … You know I'm sort of, it's hard to believe, you know a lot of folks wouldn't believe it, but I am an, somewhat of an open-minded person towards this stuff. When I'm taught or shown something new, and I think I can use it, then I try to utilize it. A lot of folks, are the, "If it ain't broke don't fix it," type. I know that just watching my grandkids grow up, they take to using the technology a whole lot more and they are more familiar with it and more accustomed to using it. By the time the older teachers get to where they are using it, guess what, they are no longer gonna be older teachers. They are gonna be retired teachers, so I don't know that we should spend a whole lot of time worrying about the old teachers than we should be preparing the younger ones and the newer ones for it. They not gonna teach 50 and 60 years. When they hit thirty or whatever they're gonna start retiring and finding something else to do.
I: Ok, although 98% of surveyed teachers use the internet to enhance learning, analysis revealed that teachers with fourteen or fewer connected devices in their classroom didn't have sufficient number of devices to access the internet. What strategies have you used, I know you don't have enough computers for students in your room, to overcome that lack of connected devices when you use the internet?
P: Media center, but dang, our school system don't have the facilities or equipment. We have 750 students and one computer lab for the entire school, I think. Maybe two now. The English department ties them up at certain parts of the year, which kinda puts us into a bind. They're trying to become more availability, whether it be through Wi-Fi devices or adding computer. That's the big thing, these kids don't need to be two to one computer. Used to, in the shop you could put four, five or six students at a welder but you can't do that with a computer. Everybody wants to get in there and get involved and if you gonna be teaching you pretty much need to be one to one. To answer your question, "What could be done," I don't know.
I: What have you done?
P: Well, like I said, we have to book the computer lab when we can book it and if we can't book it, then hopefully we can work with the computer teachers and arrange it when they don't have a class. I don't use the hand-held devices as far as letting them use their phones or anything like that. We have a set of computers between me and you but the problem with that is if you use them one period and then turn around and have to use them the next period you are dealing with battery issues so. It's more of a scheduling

problem than anything else.
I: Right. Other than the lack of devices, what have you found, from you own experience, that discourages the use of internet enhanced learning in your classroom?
P: The damn things not working. If you go in there and you got everything planned out nice and neat and then somebody has a computer problem, then that screws the whole thing up. And, one person's computer screws up and that screws everybody up. So, no technical support and in our system, everybody's so scared somebody is gonna take their job and they don't give everybody the information they need to know, I don't think, so that everybody can do what needs to be done. That's what I think the biggest problem is. If you go in there with a 50-minute class period and 30 minutes trying to get the damn computers working, then you just wasted half a day and haven't really accomplished anything.
I: Besides those two things, is there anything else that you can think of that might keep teachers from using the internet?
P: That and access to them. I don't think so. I can see myself, just the time to get stuff uploaded or put on the internet or whatever. Google Classroom is a great thing, but somebody's gotta put that stuff on there. I use Exam View Pro. Everybody else is talking about using Google Classroom, well Google Classroom is not user friendly as far as testing goes. As far as putting an assignment on there and letting somebody work on an assignment, it's fine. As far as testing goes, it's no Exam View Pro, that's for dang sure. In our system, our bunch is scared to let us put anything on our local server so, we as an FFA chapter have our own website. I'm assuming it's in California or wherever the hell it's at, that we have to pay for, because they won't let us utilize our server and then sometimes the issue between the server we are utilizing and the computers at school. They came in the other day and did an upgrade on the stuff at the high school, well, everybody and their brother can't get on the computer and can't get half of them to work for the past two weeks.
I: Well, conversely, what factors from your own experience encourage the use of the internet enhanced learning?
P: Well, the one thing I can think of that probably, I ain't gonna say sold me on it, because I was already using it, but I talked to some folks about it; it was the year my father passed away. We were preparing for a state contest and I wasn't where I could be near my team to get ready for the test material, but I already had test material uploaded and they basically studied with themselves with the stuff I had online and then they went on and won state and got to go to national with it. That's one of the things that has shown me that this can work. And again, for some reason the technology … I can stand in my classroom all day, but if I can throw a YouTube video up there that is doing the same thing I'm doing or for some reason it clicks with them then versus me standing there telling them over and over again.
I: I found that same thing myself. Survey reveals that most teachers have learned how to use the internet form their own independent learning and from other teachers rather from their degree work. Where did you learn to use the internet in your classroom?
P: Trial and error and from people that I worked with that knew how to use technology. When I first started using technology somewhat, I was in [REDACTED] and one of my friends was the computer teacher and helped me out with doing stuff as far as learning the programs and what all. I started out with an Excel program that I wrote for a gradebook.

Most of my training as far as that goes have been self-taught, self-learned or colleague taught. You know what I'm saying? I can't say that I've actually been to a workshop that was computer useful for anything. I know there's one we've talked about going to, that AET, that Texas A&M does, and I've talked to the folks at Texas A&M and they want to come to Georgia to teach it. With everything going that way, that's one of those things that we need alot of training on. You about need a whole class, yearlong, to teach the computer program before they get started, and I ain't real sure that that ain't something we might want to look at doing in the middle school. Teach that at the middle school, in the ag program, and then bring it into the high school. If they learned it in the middle school and then hit high school wide open, I think you'd see a whole different level, not that Georgia don't have a good level, but even see us increasing level on those things.

I: What advice or recommendations do you have for professional development that may improve internet usage in the classroom. You gave one, the AET, but what else?

P: I'll be honest with you. If the teachers saw how ExamView Pro worked they... it's like yesterday, I sat down and in ten minutes created my midterm exam for my forestry class. Please understand it's taken several hours of putting in to create these question banks. Now, I can sit down and in ten minutes, I can create a test for my class that I can give and have it graded. It sends me the results, shows me the score and shows me what they missed. That's the only negative thing, if there were a place they could put in there and send them an email of what they missed and what they got right, that's the only thing I can see that would improve that.

I: And somewhere to put the test.

P: I'm a big fan of that Exam View Pro.

I: Thank you for your participation in this survey and your responses will be very valuable to my research study and I appreciate it very much.

SHIRLEY INTERVIEW

I: I want to thank you so much for giving up your time and agreeing to be interviewed for this study. I am doing a follow up interview to the survey you responded to titled "Survey of Internet-enhanced Instruction in Georgia Secondary Agricultural Education." I am trying to determine how extensive the use of the internet to enhance the classrooms of Georgia Agriculture teachers, how the internet is used, what helps or hinders teachers from using the internet and what professional development ag teachers need in the area. Survey data show that almost 98% of surveyed agricultural education teachers us the internet to some extent to enhance learning in their classroom. Would you agree this is representative of actual internet usage by Georgia agriculture teachers? Why or why not?
P: It seems pretty high to me, to be honest. I definitely think 98% of teachers have to use the internet for their program even it is just for program work or emails or whatever. I mean …
I: Now, it's not the teachers using it for themselves, it's the students using it.
P: Yeah, that's why I was wondering if they understood the question. I'm sure they did. So, using Google, using any of the Google apps, or using ICEV, anything like that, I think it could definitely be true. It's just that I know a bunch of ag teachers who don't use it to the extent that, maybe they use it once a month, or maybe they use it once a week. We do it extensively here, but we are also blessed with a lot of technology as well. [garbled] Yeah, maybe to some extent, but maybe not exclusively.
I: Right, right. That was the question, some, to what degree are they using it is later on. If they use it to enhance learning in their classroom, most of them say they did. One interviewee said probably more likely the ones that do were more likely to fill out the survey than those that don't. Now, the respondents to the survey gave a small picture of the current uses of the internet in the classroom. They indicated high usage of the internet by students for research and by teachers for CDE preparation, communication, presentation and record keeping. If you do so, how do you specifically use the internet to enhance learning in your classroom?
P: You can check all of those for me for sure, I mean for record keeping we use AET, for our program we pay for that every year. We use Google Classroom for all of our CDE teams which is a way to communicate. I use Google Doc for all my ag marketing, ag comm speeches so I can edit their document and they can edit it and it saves automatically. I also do that in my classroom. I use online notebooks for my classes and I use online through Google classroom, Google slides, Google sheets … I am a Google person. I use all of that, so I barely get out paper in my classroom. I could teach my entire basic ag science class without getting out one piece of paper. So, we definitely use it a lot, I use it a lot. Like with our FFA minutes and FFA agendas are done through Google as well.
I: Ok, alright. Now, the survey also revealed that teacher with 20 years or less teaching experience believed they used the internet more effectively in their classrooms and have higher confidence in using the internet that agriculture teachers with 21 or more years of experience. Why do you believe this is so?
P: Because those people with 20 years or less have had the internet for at least some portion of their life. I grew up with floppy disks. People may not believe that, but we had floppy disks in elementary school.

I: You are not that young, I mean not that old.
P: Yes, I am. I'm over 30, yes, I am, but yeah, we had floppy disks in elementary school. And like Google, I don't remember when that came around. Like card catalogs in the library, yeah, I had to do that in middle school. We are almost digital natives, we are not there yet, like we didn't start with a cell phone in our hand, like my daughter, who is almost four and can use the phone better that I can. They grew up with it or went through college with it or grad school with the internet, so they feel more comfortable with confident than those ag teachers who have 21 or more years. They probably spent some of their time with overhead projectors, and all these other things that I don't even remember when I was in high school or middle school or anything. So, we just have a higher confidence because we have grown up with it. I had to do all of my college on the internet. We did homework on the internet. We are just more comfortable because we have had it longer.
I: I'm gonna come back to that in a minute because I want to tie that back in, but what, if anything, can be done to encourage older teachers to use the internet to enhance classroom learning?
P: I think you really just have to take one step at a time. A lot of times at professional development or even at school or one of our conferences like GVATA or NAAE, they might throw so much stuff at you at one time and you feel like you have to implement everything. If you had one thing, you are going to learn how to use Google Docs this year or this semester and just have small incrementing goals for those teachers. Maybe having a team of ag teachers who are confident with it to teach it to them or mentor them which ultimately sounds like more work, but if they are going to do it, it'd be nice to be like, "Oh, I can call up Mr. [REDACTED], and he's the Google guru," or whatever. Not those, "You need to do this, this, and this." Let's start with AET, because we have to use AET with state degrees and proficiencies and national chapter. Let's make sure everyone is proficient in that and then they can start figuring out the supplemental internet usage.
I: Alright. Now, going back to what we were just talking about, previously, that the 20 years or less teachers that if they didn't grow up with it, that they at least had it in college, high school, middle school even. Survey analysis revealed that most teachers didn't learn it through their degree work. Most teachers have learned how to use the internet to enhance learning from their own independent learning and interaction with other teachers rather than from their degree work. So, where have you learned how to use it in your classroom?
P: The internet that I use in the classroom, most of it is independent learning or professional development through my school. So, like some of the stuff I do on Google Classroom was professional development and tinkering around. I think people my age and younger feel more comfortable playing around with it and figuring it out, rather than being overwhelmed by going on and trying to figure it out on your own. In my master's program, I had to learn how to do research searching online a lot better than I did prior to that. I'm much more proficient in finding peer reviewed articles and stuff like that, but all the stuff I use in the classroom has really been self-taught or in PD.
I: What advice or recommendations do you have for professional development so that you and other teachers may improve using the internet to enhance the classroom?
P: I think the mentor thing. It's good to have someone they can call on and ask an expert and not feel like they are taking away their time or annoying somebody, because I know

like, I don't know if you feel this way or not, but sometimes people feel like they can't talk to state staff about questions because they are not gonna share or whatever, but if we made it an open forum, I'm not one of those people, but I will ask my questions. Sometimes we are just afraid to ask, like some people think they are thought of less when they ask questions, but to have an open forum where they can do that. I know I love going to professional development. I'm probably the only person who does love going to professional development stuff, but if we had more simplified things, because I know I've talked about Google Classroom and online notebooks and it goes way over the head of some people, you know, who don't know how to use the internet at all. If they came to my session they'd be super overwhelmed, but if you started really simply with the AET, or how to get your kids started in the AET or rather than going crazy with all the financial records or all this crazy stuff that I don't even understand on the AET. Those are probably bad answers.

I: No, that's ok, that's good and that's a good point that people are afraid to ask a lot of times because they will look foolish or ignorant or whatever, you know, that's ok, no one knows everything. That's not even possible.

P: That's true.

I: Although 98% of surveyed teachers used the internet to enhance learning in their classroom, analysis revealed that agriculture teachers with 14 or fewer internet-connected devices in their classroom believed they did not have as sufficient a number of devices in the classroom to access the internet as those in a 1:1 school. Many of them, including myself, do not have that luxury so that might prevent them from using the internet. What other factors have you found from your own experience that can discourage the use of the internet to enhance learning in the agricultural classroom?

P: So, one that I found before we were 1:1 at our school is managing that technology cause I still did technology in my classroom but we would use phones because a lot of the kids have phones or capabilities to use their phones, but then I'm like, are they on Snapchat, are they on Instagram … and like monitoring that. Some people say no technology at all because it's just easier to manage if you say none than to have to use it. Then, find a way to manage that technology. That's what we did before we had 1:1. That's what I was afraid of when I started going more paperless, because we would have problems with our iPads. We had iPads here and only like ten of them would work at a time. And, then all the other kids had to be on their phones and I was like, oh my gosh, they are not actually doing their work. It's easier to just say I'm gonna just use paper. If you don't have the capabilities to monitor it, and have those high expectations of the kids, for them to know you are not playing, you get off your phone.

I: Since you are 1:1, how does that affect the monitoring issue?

P: Not as much, for example: We take our tests online or most of our tests online where the kids have all of their notes online as well. So, I found the first year, second year, there were kids cheating. So, now, I just make sure I have a one-color screen for when they take their tests and it's different for every class period and they have to face a certain way in the room and I can see all of their screens and if they click off of that neon green screen, I know they are cheating. I found ways to get around it, it took time, don't get me wrong, I am sure there are kids who got higher grades than they should've because I didn't know they were cheating. Now, it seems fine. The one really great thing about technology is, especially Google, is you can see revision history, so you can see every

edit they made and who made that edit, so say if somebody else got on there and did the work for them, it would code them, like as a different person or different IP address so I can tell when people are cheating. If a kid turns something in late and they say they turned it in late, I can literally look up exactly what time they typed it and say, "No you didn't, you are gonna get this grade." So, it's something I just figured out this year, so it's gonna take time to learn and there's gonna be newer apps and better apps. I'm sure in 10 years I won't be teaching the same way I am right now.
I: Hopefully not. We all need to improve. Conversely, what other factors have you found, from your own experience that can encourage the use of the internet?
P: Anything that can make an ag teachers life easier, so if I know I can print a report for all of the journal hours from my kids on the AET, instead of going in individually into each one of them or opening up a record book, the paper record book, and having to go through each of those for all 90 of my kids, I'm gonna do it the easier way because I already don't have enough time. So, the reason I do internet and Google stuff is: one, I have access to it all the time, I can take my computer home or I was in Nashville all last week for NAAE, I can do work and I don't lose papers and if a kid says, "Oh, I lost my paper," I'm like no, you can't lose it, it's online. It makes my life easier, it makes my life easier with parents when parents have complaints and I can say, "Here's a screenshot of what your kid did," it helps me and makes my life much easier. I don't have as much paperwork to deal with. I still have papers, but they are all digital, so it makes my life easier and I save time when I'm doing grading and stuff and if anything, that encourages me to the T.
I: Right, right.
P: Cause anything that makes life easier is what I need.
I: I understand that, no doubt about that. Alright, I sure do thank you for your time and for completing the survey. Your responses will definitely be valuable to the purposes of my study. I might come back and pick your brain about how you change color stuff, cause that's a good idea.

CASSIE INTERVIEW

I: Ah, there we go. How have you been?
P: Good, just unloaded hogs and got stinky gone and
I: Of course, that's what it's all about. Oh, goodness, Well, I sure do appreciate you giving up your time and agreeing to be interviewed.
P: Absolutely.
I: I'm going to record this, is that ok?
P: Absolutely.
I: I'm doing this follow-up interview about my survey. If you'll remember it was titled, "Survey of Internet Enhancing Instruction in Georgia's Secondary Ag Education."
P: Yes
I: And, so what I'm trying to do is determine how extensive the use of the Internet is used, not by teachers necessarily but to enhance the classroom.
P: Right
I: How it's used, what help's teachers use it and what hinders them from using it as well as what kind of professional development they may need.
P: Right
I: The survey data shows that almost 98% of the survey respondents use the Internet to enhance instruction in some way.
P: Right
I: Now, do you feel that this is actual representation of the use of Georgia Ag teachers and why or why not?
P: I do, um in my classroom I more or less give students things that will lead them to teach themselves and that way I can go around and enhance, and I can go around and work with students individually based on you know their learning level or style so. I feel like the Internet or technology in general allows certain students to move at their own rate while um some of them need more of a hands-on approach, but most of them find some type of interface technology wise and it allows them to learn so I do feel like it enhances it and I definitely use it more than I don't. We've moved away from textbooks and paper and we're more, we do more hands-on projects but most of the delivery of my instruction is either by some type of video or audio or reading some type of article and then develop critical thinking skills rather than just reading and answering a short-ended question.
I: You mentioned this a little bit but go into a little bit more detail about how you use the Internet in your classroom.
P: Ok, so instead of me getting up in front of the whole class teaching one thing, I give the students a category of something they are interested in, a choice between four subjects and then they have assignments. Some of them may utilize something like ICV to complete the, you know, do you have ICV?
I: I don't
P: Ok, it has a video, or a PowerPoint and they can work through that and it has activities like matching or definition type stuff, um, there's some interactive assessments so there are a lot of different type of evaluations that I like to use with certain things like that. Sometimes, other kids, like my livestock kids, they um, they use a livestock judging thing and it's livestock.com so it's a video of a livestock class, there's like 200 something classes and they can place the class and it scores them immediately and it provides

reasons so they have to read those reasons when they place it and that helps them to develop their, seeing how reasons and terminology develop. Another instance um my veterinary science kids, my floriculture kids, anything with like a ID list they like to use cahoot and um quizlet, anything like that so they can practice identification, whether it's with terminology or the pictures of something. Wildlife kids use the audio, so they can identify the sounds, so we utilize technology in everything we do.
I: That's like CDE prep, um
P: CDE prep, if we're doing any research stuff, if they keep up. I guess I really relate FFA with everything I do. I try not teaching one flat subject across the board. I like doing different stuff for different kids cause I've noticed that my behavior is better when I give them group based stuff and they have objectives that they have to reach by a certain day, um, and they can kinda work at their own pace and they can get ahead or if they need some remediation in something they are good about coming to me and it allows me to be a little bit more free to move amongst them. And I thought it would be really tricky handling that much going on but um I really haven't had any problems. They are getting to where they come in, they pull everything out, whether it's the laptops or we have tablets, um I tell them they can bring their devices so that the kids that are ready for Kahoot! whatever um and a lot of the kids, evaluation wise, when they are ready, if they are a FFA member I give them the opportunity to do the contest for their evaluation. So, whatever they do at the contest is how I score them on it.
I: Hm
P: So, really or even doing a mock contest for their evaluation, trying to think how we use technology. Um, I think the use of social media is a big thing for …
I: So, you use it for communication?
P: Um, yes, we do. We definitely use our Instagram and Facebook for communication, but we also use it for instruction and different things. I try to get the kids to follow certain agricultural, you know, whether it's a, not a forum necessarily but there are certain communities they follow, like on Instagram, the kids, like livestock kids, they'll get on there and people post classes of like a picture of each animal and then they kinda judge each animal on the picture and then they comment. And I think that's a cool way to a, it's just different.
I: Hm
P: Um, and it's on their level and then they can send pictures, like in our barn, they'll go through and take pictures of all the animals and post it on those little pages, so people can see the animals, so as a community there's literally an online community of many different groups, especially livestock or veterinary science stuff. Um, they are also good about using like NAAE, some of them like to get on there and look for resources too. So, they learn to search for resources, um, I'm very much, like, why reinvent the wheel? kinda thing, um …
I: Right
P: So, they do their own thing sometimes, so we definitely use computers a lot, and tablets and...
I: Now, are you one to one?
P: No, we're not, but um, I try, there's a computer lab right beside my class, um they can do BYOD, but I try to have everything they need study wise or whatever it is, it's on my teacher page on the school website. Um, for the kids that don't have devices, I have a

couple of personal tablets that I keep at school, um just for instruction and then I have six desk tips, um seven desktops in my room and if we run out we have access to iPad and laptop carts for our school, so we can pretty much put a device in everybody's hand.
I: Um, that was kinda the next question, ah, what strategies have you had in your classroom to overcome a lack of Internet connected devices, um cause that was one of the things that the survey revealed was that those with like fourteen or less devices they felt like they didn't have enough.
P: Um, I definitely feel like one day, after I get through raising money for everything else I need, I would like to invest in some type of mobile cart with something, I wish, I wish our kids were one to one. I had a lot more success when I was in a school system that was one to one from the middle to twelfth grade level but at our school level we have to compete with academia because they have like, the school is pushing a lot of online based learning such as USA test prep and um other things so while we do have access to computers sometimes our supply or our access to them is set behind those that need them for more of the academic subjects that people consider, so um sometimes you are dealing with you know connections are not as important so you know you use your own.
I: I know, I deal with the same thing all the time.
P: We definitely get short changed, but it usually balances out enough that enough kids have devices and they can do, I have a Wi-Fi thing in my room, so they can all get on the school Wi-Fi and do what they need to. I do, you do have your few kids that have devices and don't get enough done because they are, you know, catch people on Snapchat or Instagram whatever, um so the BYOD part, you can run into that issue but other than that it works pretty well for us.
I: Ok, now that was one of the things that people had pointed out that had actually hinder, the using technology, not technology but the Internet specifically in the classroom. What other factors have you found from your own experience that can discourage the use of the Internet in your classroom?
P: Um, I think the social media thing, um, it can be limiting if you have, if you're in a sense where you have to do BYOD then your gonna have people on their own phones, so I think that that aspect is a disservice in the classroom. The kids without devices, you know they feel a little shortchanged and sometimes they, they get kind of, "You know I don' have a device so", some of them might be embarrassed and don't say anything so, but I try to make sure everybody has something access wise. Sometimes you have to make people buddy up and that doesn't always work well because they don't click. Then like I said competing with academics hurts connections wise because they think we are supposed to be outside in the greenhouse all the time so in our school farm there's only so many lessons you can do at our facility.
I: Can you think of anything else other than just the devices themselves that actually might hinder or have hindered you?
P: Um, I don't know if this even matters but if the Internet goes down and you are doing an independent, like our Internet here lately has been just stop and go um constantly through class so the ability to get stuff done when it's down, you have to have a backup plan and I didn't necessarily think, going off the fly, that was fun.
I: I can imagine, ok. Alright, um, now survey analysis revealed that those teachers with 20 or more years' experience tended to have less confidence in their ability to use the Internet effectively and all that kind of stuff compared to those, um sorry, those with 20

years felt more confident than those with 21 or more years' experience. Why do you believe this is so?
P: Um, I think just the use of technology as we've aged, like I was the first generation of people with cell phones so, like we've had cell phones since I was twelvish, elevenish, but kinda before that you had more of a learning by textbook, learning by doing but they really started implementing technology about the time we hit middle school, um and by the time we got to high school we were able to use Internet on our phones. So, maybe I think that just a generation thing of you know access and um, maybe sometimes even demographics of an area, maybe their access availability, um could be part of that. Mr. [REDACTED], when I taught with him, he was on year 42 and that man he could turn on a computer but that was about the limit of it. And he was one those, he wouldn't necessarily use it. He was more of "stick to what I know", read the textbook, answer the questions at the end of the chapter, you know, and he ah, I do feel like some of the more experienced teachers with, I don't want to say 20 plus years, I think we use technology more than we are hands-on sometimes and maybe that takes away a little bit from Ag and maybe these people, maybe they are confident in these but are confident in those hand-on things they are learning to do so I'd say the kids are with some of those teachers have more applicable skills on how to do things vs maybe some of mine that are learning you know we are learning sciency things but you know what about the technical how do you do it kind of stuff because we don't have the resources to do certain hands-on kind of things so I don't know if that connects or not.
I: Hmm, that's good, I haven't heard that one before. Um, what, if anything, can be done to encourage older teachers to use the Internet to enhance classroom learning?
P: Um, well I guess that's to do with professional development, um but part of its willingness to use it. How many of them are really willing to use it? Um, if they are willing there's so many great professional developments but don't really know about it. If they are not technology savvy or whatever or if they even know how to look at professional development or those things because obviously it is CTERNs kinda one thing but a lot of people don't see past CTERN professional development. Um, maybe that's a hindrance, lack of knowing how to look for professional development. There's so many like, ya'll might use, some people use Google or you might use Office 365 or the interface that everyone uses is different, um, so I guess you can kinda struggle with there are so many versions of what I can do, like um, like, I don't know how they use the Google classroom because it's not something we really use but I like the availability of Office 365 because that's what our system uses. Um, a lot of these people don't understand how instinct it can be maybe so. Say your question again so I can remember what I was talking about.
I: How can we get these older teachers with 21 plus years to, like the guy you worked with, he's got 42, how can we encourage them to use the Internet in the classroom?
P: Ok, um, maybe some of them statistics of how, or samples of students, like the, um, I feel like those demo welders, those are a cool way to use technology in the classroom, um I guess that's a different form of technology but um, really showing them where some people are having success in it, how they can implement it and, you know, bridge the gap between that generation that they are teaching and that generation that they are from, so maybe, you know, lead by example, hands-on learning, you know, let them. The professional development is what it's gonna come down to, teaching them how to do

things, like the geographic systems class that I taught 3 or 4 years ago, that's a very technical class and someone that's been teaching for a really long time that's not comfortable with computers would not do well with that class. Because there are so many layers of the ESRI stuff so …
I: Ok, it is a challenge, no doubt. Now, you listed some things that have kept you, and from your experience, from using the Internet and you kinda hinted at this, but give me kinda a succinct statement about what other factors have you found from your own experience that have encouraged the use of the Internet?
P: Well, I try to give assignments that a lot of the kids, most of the kids have some kind of Internet access at home so I try to do things so that if they don't finish in class, because I have a very wide variety of students that are, they aren't slower, they learn at a slower rate and they just need more time, but then you've got your other kids that are just, "I need something else, I need something else, done." So, the use of the Internet, they can work on stuff at home that they can't finish in class and I like that, um, then the use of technology wise, these kids would rather do something on technology than on paper. They hate writing, they are way faster at typing than writing so I feel like um, they feel like they can get more done whether it's writing or typing, um they type faster so a lot of my kids prefer to type something than to write by hand just because of speed and they are ready to move onto the next thing. When they get done with their stuff, reward them with some kind of, they love to play games or the competitiveness you can add with the Kahoot! or Quizlet and then the instant gratification with the scores. Those things, I feel the kids feel more success than having to wait on me to grade something. Then there's just so much access to information that they are looking for. Um, I think those are factors that encourage the use of technology
I: Now, I'm gonna stop you here, you talking about the instant gratification, uh, you said a little bit about assessments, how do you do assessments online?
P: Ok, one example I talked about was the livestockjudging.com and it's an interface that allows students to watch classes of market or breeding animals and …
I: How do you record that grade?
P: Well, they have to, when they score the class they have to call me to the computer or they can screen shot it and send it to me and like if they place a 50 in that class that's considered a 100 so I can record that or I can put a class up on the board for those people in that category and as a group they have to sit down, they have to write reasons for that class, and I'll let them write down their placings and I'll kinda cover everyone's placing up so they can't change it and I'll pick one of the classes that they picked and it lists everybody's score. If you picked, whatever placing you picked, it has a score for whatever combination it could be and then I'll let them review using the reasons that are on there but I also, after that, to kinda get them comfortable speaking, they have to read the reasons aloud and see, they have to talk about what they agree on, what they disagree on, and then they can kinda share with each other about that set, it's kinda like a pair/share deal. I guess you'd say that's one way that we do it. Kahoot! is another great way to assess people.
I: Now that's just formative assessments. Do you have any summative assessments?
P: Ok, with technology, sort of. Ok, we, I haven't done this in a while. I did it my first year teaching, where they had the assessment online like that, I guess our school system just doesn't have that, but my dream of what I'm moving to, and what I've done when I

was teaching at [REDACTED] , giving them the online assessment, where it's mix and matching, multiple choice, and then like a short essay, or short answer type deal and then setting up a, depending on what the contest is, we'd have to move away from the technology in some instances but doing … honestly I'd make it more like a mock contest, you know, they could do the identification portion on the computer using pictures or samples. Um, but then, hands wise, they learn the practicum for certain contests like wildlife see, I have some of the kids that learn the deer. They have to score a deer. Um, and they can use the websites to enter in their score, it prints it out for them, so I guess that'd be a little bit of use of technology, but I wouldn't consider it an assessment. I try to use the rubrics from the contests to let them see how they score those practicums um, and different things like in veterinary science. They have to demonstrate those things so, ok. That's where I was headed with this.
I: I understand, I was just trying to feel that out. That's cool, you know, a lot of people are using Google classroom now and I've actually started doing that, it's just a little difficult to get everything in there so um, anyway.
P: Yeah, I, we, our county almost blocks Google, so you can't get into Gmail.
I: Crazy
P: They'll use Office 365 and it syncs everything and it saves it online, so they can share it with me. If they do an assessment, not an assessment, if they do an assignment, they have to share it with me, whether it's a word or a sway or a PowerPoint or whatever. Um, but they have learned to share it with each other u, I don't know, I think they are a little bit ahead of me. I haven't really had to deal with it too much, but some of the kids, they'll take credit for somebody's else's work and that's it.
I: Now, this is the last part. Most of the survey analysis revealed that teachers, they learned how to use the Internet, not from the degree work, but from their own independent learning and interaction with other teachers. Where did you learn how to use the Internet in your classroom?
P: Um, I'm gonna say a lot of it through my coursework, really. We, I did have personal experiences with using computers and stuff, but I didn't, where I went to school, I didn't have access to other teachers, um, that I felt confident in asking, because there weren't that many ag teachers or whatever. And then I feel like where I went to school at, they were very behind in technology uses, such as teaching 1997 PowerPoint instead of 2010. Um, I feel like the technology of my program was very behind, so I definitely had to learn on my own through my college coursework by doing stuff at home, like a live text and ah, there's another interface we had to do. Um, I also learned a lot from my classroom experience. I learned a lot through taking courses, like professional development courses, that has been one instance that I've learned a good bit but I don't really feel like, I learned some from you I guess. Um, but, I don't really spend a lot of time with other people, because I just don't really have anyone around me to resource like that, so I've had to figure it out on my own or Google it.
I: Umhmm, ok.
P: And then I, another thing, if anyone else is like me, they are gonna get on something like community practice and ask, ok, what are you doing? Or these FaceBook share group discussions for Ag Ed that we are on or whatever. Um, I think that's one thing where we learn a lot from other people technology wise.
I: What, in that same topic, in that same vein I'm talking, what advice or

recommendations do you have for professional development so that you and other teachers may improve using the Internet to enhance the classroom?
P: I guess that, don't be afraid to invest in something. Sometimes it's better to, like when I say that, I'd rather invest in ICV and the stuff that I know my students can use and that is helpful to them. Last year we struggled with contests. This year I've invested in resources and technology just to help them study rather than just finding whatever I could find and hoping that it works. We've done a lot at contests this year so (inaudible) yet. Ask around and see what works for other people and just use technology to enhance what you are doing instead of letting it hold you, you know, it can hinder but there's definitely more potential than hindrance.
I: How can we develop some professional development type things to help them?
P: I thought that the like, you know, during like GVATA or whatever they got like [REDACTED], she had some really cool, no, she did differentiation, nevermind. Maybe instead of doing, we could do some breakout sessions on principles of technology use, not just a "Here's what I do in my classroom," but some really, ok, show the steps of it or maybe get a group of people to, if there's a lot of Google use in their classroom then go to Google training for it. If we did it at the ag level, I think it would be a cool breakout session to show people the technology and the Internet-based stuff that you can use cause a lot of people don't really, I mean, they have their samples and stuff but they don't give enough interaction to see if they like it or not, so … I had to spend like a $100 to see if I liked the livestockjudging.com and I like it and the access it gives us so … I guess if people, not necessarily a discussion but, maybe almost a link that shows those people, "Here's how to use it, here's how it's helped us," some of the Internet sources that we use. Does that make sense?
I: Yeah. Ok, alright, well cool. Well, I certainly do thank you for participating in this study. Your responses are very valuable, and I want to thank you for helping me out.

REX INTERVIEW

I: I appreciate you for giving up your time this morning and agreeing to be interviewed. I am doing a follow up interview to the survey you completed. If you remember, it was called Survey of Internet-enhanced Instruction in Georgia Secondary Agricultural Education. So basically, what I'm trying to determine is how extensive is the use of the internet to enhance the classroom, not just how many ag teachers are using the internet, but using it to enhance learning with their students, how it's used, anything that helps or hinders that usage and then any professional development that may help. The survey showed that about 98% of the people that responded use the internet in their classroom. Do you agree that this is representative of actual usage by Georgia ag teachers? Why or why not?
P: I think everybody's got to use it. Most of the contests and FFA stuff is online so they have to use it to some degree. Talking about enhancing their classroom, I'm not really sure if that is actual representation. I think everybody has to use it, like our school system, they are forcing us to use the internet with everything in our classroom, to enhance our classroom. That could be a good thing. I'd say everybody is using it, probably 90% of everybody is using it but not everybody is using it to the same degree to enhance their classroom.
I: Alright, that's a good point. So, what does the school system do to force you to use it. How do they do that?
P: Every new faculty meeting, every PLU, it's all about these new different programs that you can use in your classroom, like flipping your classroom, videoing yourself and students watching it at home. All these different things that they show us we need to be doing. Stuff like that constantly, different programs that we can use. Everything is going to Google Classroom stuff, which that is a good thing, but I just don't like being forced to do stuff cause everything is going to Google but they are not really telling us how to use it. I guess they just assume we know how to use it, but we really don't.
I: Right. Um, we will come back to that. That's a good point you used there. Respondents gave a small picture how they use the internet. How do you specifically use the internet in your classroom?
P: I use it every day in my classroom. A lot of the stuff we do in the classroom is based around a contest, like with nursery landscape, we learn all the plants on the list and we use those tests for the 25-question test and sometimes I use those tests … we will just pull a test up and use that in class. We use Quizlet and Kahoot! and stuff like that that I have with Google Classroom for different contests that they can do in different classes like I have a natural resources Google Classroom and nursery landscape Google Classroom and stuff like that. Mainly CDE preparation and some classroom stuff.
I: How about record keeping?
P: Yeah, well, all my SAE stuff is handwritten stuff. We don't have AET. I know Mr. [REDACTED] uses it for state degrees and stuff and proficiencies. They do online stuff like that. I'm still with paper thing on SAE. We have computer labs in our school, but every time I've signed up to use one, somebody else is in there. We kinda just stay away from there now.
I: Right. I'm gonna come back to that one to in just a second. One thing you said was that you pull up a test. Are you talking about from the Georgia Ag Ed website?

P: Yes
I: How do the students take that, when you pull it up? Do they print it out? Do you put it on the board?
P: I put it up on the board, cause in our classroom, we don't have any Wi-Fi connection. We try to do Kahoot!, and everybody has their phones and about six people can connect, that's about it. We are down in a hole, I guess, but the Wi-Fi is terrible.
I: Now, along that same vein, even though about 98% of surveyed teachers used internet in their classroom, those with 14 or fewer connected devices in their classroom believed they didn't have sufficient number of devices to access the internet. You are obviously not a 1:1 school. What strategies have you used to overcome your lack of connected devices and you said you don't have any Wi-Fi.
P: Yeah, it's tough. We try to use it on some days and they connect. Other days they don't. Our school talks about being a 1:1 school but we don't have them for our classroom. I guess we can go get them, but we've never really done that, because we have no Wi-Fi, they can't really connect to anything down there, so, there's really no sense in us trying. Every once in a while, we will go to one of the computer labs at the high school and do some stuff. We mainly just do stuff off the board. We try to utilize that the best we can. It's not always the prettiest or the cleanest like if we had a chrome book or something, but I think we do pretty good with it. I would say that a lack of devices is definitely one of our limiting factors.
I: What other factors, besides lack of devices, from you own experience can discourage you from the use of internet-enhanced instruction in your classroom?
P: A lot of times, like at the middle school, we have some Wi-Fi, they get out their phones and stuff to do the Kahoot! and a lot of times they just play around. I don't really let them get on their phones at all. They want them to use technology in the middle school but to me it's more of a hindrance trying to keep your classroom under control. They are playing on their phones all the time and you have to constantly monitor if they are on their phones and make sure they are doing what you told them to do. That's probably the biggest thing, and we don't have any Wi-Fi connection in the high school [laughing].
I: Alright. So, you are not only a lack of devices, you are also a lack of access?
P: Yeah, it's a struggle down there.
I: That's tough. What factors actually encourage you, from your own experience, to use internet-enhanced learning in your classroom?
P: Just seeing how well it can work. Just with the few Cahoots we have done, it helps kids out. They have a good time. They enjoy the class. So, it can be a positive, beneficial thing if it works. If you can use the Google Classroom stuff, know how to use it and can put the time in it really makes things a lot easier, but it's a lot of work. On the front, you have to do a lot of work, but the rewards are pretty good.
I: Yeah, if you put that time on the front end. I can see that, for sure. Now, do your students have to get on it outside of school when you put stuff on it for them to look at?
P: Yeah, I give them the code and they can get on there. I'm sure they do. I know my contest kids do cause I make …
I: Now that's on Google Classroom?
P: That's on Google Classroom. Like ENR, I made five or six ID tests for them to do on Google Classroom. They go in, and type them in, and I can go back and see how they did

on it.
I: Now, you set that up like a form, a Google Quiz form?
P: I think that's what it's called, a form.
I: Alright, the survey indicates that teachers with 20 or more years' experience have less confidence or don't feel like they use the internet as confidently as those with 20 years or less experience. Why do you think this is so?
P: A lot of them are probably just set in their way. They just want to do paper stuff and I can see the benefits in that. That's how they were taught and everything. A lot of them, that technology stuff is so fast, they just throw it at you so quick, I can understand it. When you are past 20 years you probably just don't care about that, I would assume. When I came through UGA, a lot of stuff was off the internet, so that's just what we did, we were used to it. Everything was internet based, but when [REDACTED] came through everything probably wasn't that way. You probably gonna stick to your roots when it comes to that.
I: Right. What, if anything, can be done to encourage those older teachers to use internet to enhance learning?
P: All these classes we go to at our school, they will throw three or four programs at you at one time and not sit on one and really show you how to use one. If you had older teachers and you showed them how to use one thing and was very deliberate with it and taught real good, maybe like on a one on one basis. If you had a bunch of older teachers in the room and you a big shot throwing all these big words and technology stuff around, they probably aren't going to listen to you.
I: So, basically focus on one particular usage at the time and individually follow up with that teacher?
P: That's what I'd think. You will have to do some one on one stuff. Like I said, they're probably not as willing to learn new things after 20 years, I would assume.
I: Now, survey analysis also revealed that and to talked about this and teachers didn't learn how to use the internet from their own individual degree work as they did from their own independent learning or from interaction with other teachers. Now, you mentioned this a little bit, but expound on where you learned to use the internet.
P: I learned the basic stuff basically in high school, I think. Then in college, that's most everything we did, internet stuff. A lot of stuff in these past 3 years as teaching, I've done on my own and then going to PLU's and talking to other teachers. I've done a lot of investigation on my own to try to learn. That's probably the most beneficial, doing my own thing. I work better when I focus myself and try to do it myself.
I: So, just one more quick question. What other recommendations do you have for professional development so that teachers may improve their use of the internet, besides focusing on one thing and then following up one on one?
P: That's probably the biggest thing. Focus on one thing and then show them how to do one thing instead of like throwing three different things at one time. I went to a PLU last year. They showed us how to use Kahoot! and I think everybody in there knew how to use it after that. It's pretty simple. We learned how to use it rather than just throwing it at us, assuming we know how to use it and then going on to something else. That's my biggest point, I think, about that. Just be intentional in how you are trying to teach it. Don't just assume everybody knows how to use it.
I: Right, cause a lot of them don't

P: A lot of them don't. A lot of them don't know how to type the stuff on the computer.
I: Well, [REX] I really appreciate your time. Alright buddy, I appreciate it, bye.
P: Alright, bye.

SUZY INTERVIEW

I: Well, I sure do appreciate you for giving up your time and agreeing to be interviewed for this study. I am doing a follow up interview to the survey you responded to titled, "Survey of Internet-enhanced Instruction in Georgia Secondary Agricultural Education." I am trying to determine how extensive is the use of the internet to enhance the classrooms of Ga Agriculture teachers, how the internet is used, what helps or hinders teachers from using the internet and what professional development ag teachers need in this area. Now, the data show that almost 98% of surveyed Agricultural Education teacher use the internet to some extent to enhance learning in their classroom. Do you agree that this is representative of actual usage by Georgia ag teachers? Why or why not?
P: Yes, I think so, now I don't know for sure. I'm not in everybody's classroom, but I know that just in casual conversations that you have with other teachers at conference and at CDE's, you always pick up on different websites or different activities you can do with the students. I don't have any concrete evidence for that.
I: That's what you heard most of the ag teachers you've been in communication with do use it to some degree?
P: Yes
I: Ok, now those respondents have a small picture of the current uses of the internet in the classroom. They indicated high usage of the internet by students for research and by teachers for CDE preparation, communication, presentation and record keeping. If you do so, how do you specifically use the internet to enhance learning in your classroom?
P: I use the Georgia Ag Ed website quite a bit for review for parts of the animals. I actually have the worksheets that go along with the PowerPoint presentations that are on the Georgia Ag Ed website. We use it for CDE prep of course with the tests. I use Quizlet quite a bit for review and for introduction of information to the students and Purposefulgames.com, I use that to some extent as well. But, mainly, it's the Georgia Ag Ed site and Quizlet that I use.
I: Now, when you use the Georgia Ag Ed site, do they go themselves or do you put it on the screen?
P: They go themselves, I am very blessed to have about 28 desktop computers. This year we went to every student having an iPad, a one to one. We haven't gotten all the kinks worked out of that yet, so we are not utilizing that yet as much as we will be in the future. Right now I use the desktop computers.
I: Yeah, iPads have been an issue with a lot of folks [laughing].
P: On paper, it's a very good idea, but it just hasn't got there yet.
I: One more little question about the Ag Ed, you said they have worksheets they use with that information from that site. Do you just do it from the PowerPoints actually on there, so they can just pull them up on their own screen and do it?
P: Yes, they seem to follow along a lot better that way than me trying to do it on the screen. That way everybody can work at their own pace.
I: Right, ok, cool, now, survey analysis revealed that agriculture teachers with 20 years or less teaching experience believed they used the internet more effectively in their classrooms and have higher confidence in using the internet than agriculture teachers with 21 or more years of experience. Why do you believe this is so?
P: I can speak for the ones 21 and above on years of experience. We didn't grow up

with it, this was secondary for us and we've had to learn it on our own, whereas, the younger folks coming through now have grown up with it. I'm always afraid I'm going to break something or get lost or go somewhere I shouldn't go. So, I'm a little apprehensive about it, I'm getting over that now. You just jump in there and go. And I think with time, experience and staff development that we have or just talking with other teachers is very helpful for them, for us.
I: Right. And that segues into my next question. What, if anything, can be done to encourage older teachers to use the internet to enhance classroom learning?
P: I think staff development, and hands-on staff development, not just a "go in and listen to it". I think we need to get in and actually do it. We do learn by doing. Personally, that works best for me. Just getting over the fear of trying not to mess up and lost and not being embarrassed in front of the students. A lot of times, the smarter students will show me what to do, a lot of times. I do think staff development, that's the only way that we are gonna get over it.
I: Ok, now, although 98% of surveyed teachers used the internet to enhance learning in their classroom analysis revealed that agriculture teachers with 14 or fewer internet connected devices in their classroom believed they did not have as sufficient a number of devices in their classroom to access the internet as those in a 1:1 school. Since, you basically have enough, what other factors have you found, from your own experience, can discourage the use of the internet to enhance learning in the agricultural classroom?
P: Well, the websites change from year to year, even from month to month on some of the websites that I may have used over the years. For instance, University of Kentucky had a wonderful website for learning activities and it just went away. You actually have to go in and check before you are actually teaching the class to make sure the websites are still there. Sometimes, it's hard for the students to get to the part of the website that you want them to be and we think that students sometimes are very proficient on the internet. Well, I've found that they are really not. They know how to get to their part of that, but as far as researching, and finding particular websites that are credible, that's a struggle for them. I understand That with the iPads we are gonna get what's called Apple TV and that is supposed to direct students to go to certain websites and they can't go anywhere else, but to those websites and I think that's gonna be helpful.
I: If they work.
P: Yeah, if they work and even if they don't I'd say 99% of the kids have smart phones and a lot of times they are faster than what we find on the computer. A lot of times, I'll just say let's use your phones to do something unless we are typing something out, they can get to it faster on their phones than they can on my desktops.
I: Right, do you have any troubles when they bring their own devices?
P: Well, I'd say it's 500 times a day, "Put your phones away." [laughing] But, I'd say that's with every teacher. I call them oxygen makers and pacifiers.
I: That's true, that's true. Now, conversely, what other factors have you found, from your own experience, can encourage the use of the internet to enhance learning in the agricultural classroom?
P: The review activities on Quizlet and the Georgia Ag Ed site. I can't run off enough papers to keep them busy to review and it's instant gratification, it's graphics, that a worksheet does not provide. I think it just does a better job.
I: Ok, now, survey analysis revealed that most teachers have learned how to use the

internet to enhance learning from their own independent learning and interaction with other teachers rather than from their degree work. Where have you learned how to use the internet in our classroom?
P: Probably more from teacher interaction and sitting underneath the oak trees at the camp, trial and error, staff development to some extent and the kids will find a lot of things and when you send them on a wild goose chase, it's amazing what they will find. Searching for something else they'll find activities, that's how we found that purposefulgames.com because the University of Kentucky site was not there anymore so I said, "Let's google some games and see what we can find." One of the students' found that so it's just trial and error and sometimes as a teacher you don't want to be out of control for your classroom like that but sometimes you have to let go of the reigns and see what they can find. I certainly don't have time to sit there and go through all those websites. To some degree, my graduate work kind of forced me to look at ways to research and do some things online as far as online communications and that sort of thing. That has been helpful, but I didn't per se have a class that taught you to use the internet.
I: What did you get your doctorate in?
P: It's in ag education from Auburn University.
I: Oh, ok. Last question, what advice or recommendations do you have for professional development so that you and other teachers may improve using the internet to enhance the classroom?
P: Well, they have touched on it a little in the past, and I haven't really got into it, but the Google Classroom, I know some teachers use that and they've hit and missed with it at mid-winter conference and at summer conference. I think if they could continue with that it would be wonderful. Just anything that would help us manage our classrooms a little bit better and deal with the diversity of kids we have to deal with. Just make our lives a little easier and develop the students as an independent learner, I think is a plus.
I: Well, I certainly do appreciate your time. You have certainly helped out my research study. If I can help you out in any way, please let me know.
P: I'm proud of you … just keep moving.
I: Alright, you have a good Christmas. Bye-bye
P: Bye

DELORES INTERVIEW

I: Thank you so much for giving up your time tonight, again. What I'm basically doing is following with an interview with the survey that you responded to. Just to give you a refresher, it's a survey of Internet Enhanced Instruction in Georgia Secondary Ag Education.
P: Ok
I: So, basically what I'm trying to do is determine how extensive is the use of the internet to enhance Georgia ag teacher's classroom? How they use the internet to do that and then those factors that kinda help or hinder them from doing it and then any professional development that they may need in this area. Now, on the survey it was neat to see that about 98% of those that responded actually use internet to enhance learning in their classroom. Would you agree that this is actually representative of uses by Georgia teachers? Why or why not?
P: I definitely agree for our school. We had a big push over the past few years for one to one technology for students, so each student has a laptop that they take home with them every night. There was even a big push to make sure that all areas of where students lived would have internet access and all kinds of things so, because of that the whole district has gone digital. We do all of our lesson plans and our lessons themselves through, our district uses Google, and so we all have Google classrooms and we post our assignments through Google classrooms, we upload our lesson plans to Google Drive. Everyone uses surveys, I use them for giving tests and the push was from our district, but I think that it has really, although I still use a lot of paper and I actually teach a lot outdoors with nothing. I require my students to keep a journal, a digital journal of their work. So, I use it daily and although the push was originally from the district, I agree that it's a good one. I allow students to use paper if that's still what they want, but the one drawback is and I have to leave this as an option for every substitute that I have; I still keep the textbooks in the classroom. If the power were to go out, and it has before, and we've lost internet connection, then if you don't have that back-up paper plan then you're (could not understand) with trying to figure it out at the last minute. [laughing] I use it for, it's easy for me to check their work, if they've shared it with me then it's mine too so that's kind of a new thing, that I certainly didn't grow up with. It's almost like a virtual reality you have going on with the students. You can correspond on their documents or whatnot, their presentations, make comments, that you might not necessarily have the chance to do in class. As a middle school teacher, I have 250 students per semester, since it's a semester course, so over the course of a year 500. If I were actually looking at papers, I don't think I would do that as frequently. I know my first year, I actually took notebooks home, back and forth, big boxes of students' notebooks [laughing].
I: Alright
P: Yeah so …
I: Ok, do you think other ag teachers, across the state, are doing the same thing?
P: Um, I do. I feel like when I've gone to summer conference and mid-winter conference during the breakout sessions, there have been, I feel like there have been like cutting-edge technology sessions that made me feel that most everyone is also similar, you know, in a similar state of using the internet, if not even beyond what my district is doing. Maybe

we are in the middle. I feel like there's always something new out there. I'm not really a technological, um, that's not really my forte, so I am always trying to figure out [laughing] how to do it.
I: Right, now you've mentioned several things that you actually do using technology in your classroom. You mentioned Google Classroom, you assess them, and they have digital journals. Is there anything else that you do to use the internet in your classroom?
P: So, let's see, I have a website. Mine's not developed as some teachers, but it does make it for, say if a parent has a question about the SAE, to have it all up there on your website and they can access that from home and click on a link and get an example, get the instructions, and get the form, and the spreadsheet and all that so … For me, it's a more practical thing. We have this in our district called, anyway, there's different levels of using technology so the … It's similar to Blooms Taxonomy in that as you increase you are actually doing transformational work with the internet and with technology. I don't feel like I do that because of my background and because I put a great importance on actually getting outside and working in the greenhouse, and the garden, and with the animals rather than being inside on a computer. So, it's a combo for me. So, for me it's more practical. I wouldn't go very far up the Bloom's Taxonomy pyramid with how I use technology. It's more a replacement of paper and it's easier and the students enjoy it as well instead of just writing in a journal or doodling on paper, they actually insert pictures and look up supportive links that they share with me and that sort of thing.
I: Survey analysis reveal that those teachers that have 20 years or less experience believe they use the internet more effectively and have a higher confidence than those with 21 years or more experience. Why so you believe this is so?
P: I think that probably it's the education training that the teachers went through. This is just in my thinking, that as they themselves, now this doesn't always align with the age range of the teacher, but it may. If you are out of schooling yourself, it changes so quickly. I feel like that technology changes so quickly that unless you are in a schooling situation where someone is teaching you how to use the new methods and that sort of thing, then you don't really know and even if you did learn then maybe you wouldn't feel as confident using it, because it's just not your norm. That would be my thinking on that.
I: What if anything can be done to encourage those more experienced teachers to use internet enhanced learning?
P: Well, one thing I mentioned before; I can think of a couple of breakout sessions at conventions and conferences, that sort of thing, where that has been offered and I do think its very useful. That would be a setting where teachers would feel more comfortable learning something with their peers. When there are these options and you are there to learn then I think that would be a good time to share that. Part of me misses the paper journal. Sometimes I just want to say, "You are on your computer in all your other classes, in mine we just aren't gonna open it." There's part of me that want to do that and I am an older teacher. I don't have that much experience teaching Ag Ed, but it could be personal preference and I do think that might come with age.
I: Now, the teachers that responded to the survey that had less than fourteen connected internet devices in their classroom believe they didn't have as sufficient a number of devices as those in a one to one school or where everyone had a computer or device. What other factors have you found from your own experience other than availability can discourage the use of internet enhanced learning?

P: So, our students immediately play games so, once they are given it's like opening Pandora's Box. It's almost as quick as the district providing it they have to come up with a way to take it away or blocking certain things. We had landschool, now we have GoGuardian where a teacher can actually see the desktops or be notified if their students are going on to something they are not supposed to be going on to. Unless you want to be on the internet for one particular, like WebQuest. I think that is very useful, just an online guided program. There's a plant pathology research-based website that's really good. I can see where that …
I: So, student distraction is a big factor.
P: Exactly, I actually try to limit their time, so I put up a timer for them to put down a starter or a particular portion of the lesson we are doing online. I try to make it really short because any time that's not organized in any way becomes playtime and actually the administrators are looking to see which students and which classes off task are so in the end I could be reprimanded for no watching my students as closely as I should.
I: That could definitely discourage you from wanting to use it.
P: Absolutely
I: You are punished for student misbehavior.
P: That's right and we do get tutorials afterschool, or in our professional learning time. We can learn to use the internet deeper or better, like that Bloom's Taxonomy I was talking about. Anyway, I tend to, I am not really able to go to those. I am usually with students after school and that sort of thing. And again, I don't see where I need that. If it became second nature to me, then yes, I'd use it.
I: So, versus what keeps you using it, what factors, from your own experience, encourage the use of internet enhanced learning?
P: Well, for students who are following me, I can share my lesson for the whole week or entire unit for that matter on Google Classroom and they can follow along with me and they actually come up with supporting information that teaches me. In a similar way the students always teach the teacher, it does happen with the internet as well. They'll come up with, "OH, I just saw this", or "this just happened today" and it's something I didn't see in the news. That's for those students who are on task and following along. Timing of using the internet makes it a useful tool. To me, that's a benefit. For the students to have that, it increases their participation with me. They are thinking about agriculture and may share it with me and then it in turn increases my thinking.
I: Now, you were talking about professional development and you mentioned earlier that you did not learn to use the internet from your coursework in college. Survey analysis revealed that most teachers are in the same boat, regardless of experience in years of teaching. Most have learned from their own independent learning or from interaction with other teachers. So, can you expand a little more on where you had learned to use the internet in your classroom besides those things?
P: I feel like I learned trial by fire, in that we have been required to use this, required to do that. We will have the sessions on teacher workday or teacher professional day and we have rotating sessions similar to what you might see at summer conference. We are taught different things, usually by the media specialist or it could be a district IT person that comes in, but I must say that I typically don't use those things until I realize that my peers are all using that. Say, like a Google form for a task which it allowed me to grade easier. Also, if all the teachers are using one thing and you are not, you really must make

your case for why, they'll ask you why. You don't want to let them know it's because you don't know how. [laughing] You'd have to be real adamant about "you believe in paper" or whatever or learning to write in cursive or something but anyway. There's that. I'd say yes, I've learned from my peers. I've learned from administrators in the school, definitely the media specialist. They are really good about realizing what we need help in. There are other teachers in my school, they send around a survey every week about who needs what, and what students should we focus on and I'm not even engaged enough with technology to complete their survey. It's like a weekly fellow teacher survey and that's really not what I look at. I miss emails. I'm not really a technology-based person.
I: Finally, my last question and you've talked about it a little bit. Summarize your recommendations for teacher development for ag teachers to improve their use of Internet enhanced learning.
P: I went to one breakout session about using Google Classroom for your FFA chapter and having various classrooms. I had not thought of that before. I was thinking strictly classroom. That was really helpful, so during that session, they went through different aspects of Google Classroom that I didn't know about, like making folders, archiving and that sort of thing, so, that was really helpful. All I know is Google Classroom, because that's what our district uses, so maybe if there were other districts out there that use something different, that would be helpful, like learning different ways to use technology, because I feel like I'm kind of one-dimensional. That would be useful, and then other things like, I don't even know if web quests is still available, but that sort of thing where they require their students to be more longer term on their computer, working thorough something that got a little deeper, and more transformational than just replacing paper, knowing about those sorts of things, so maybe like something that has initial questions that led you to deeper research and through that deeper research gathered something bigger, something deeper. If that were around or, it probably is. If that were made known, I'd probably use it occasionally. I'd still do a lot of outside work and paper work. I thought of one other thing with the students, not just being off task, but they often have lost their charger so they often use the excuse that their computer is dead and they don't' have a charger and there aren't any more in the library, that sort of thing you always deal with student's making excuses.
I: Went from not having pencil and paper to not having your computer charged.
P: That's right.
I: Alright, I sure do appreciate it.
P: Good luck with your research.

PAYTON INTERVIEW

I: Well, I appreciate you giving up your time and agreeing to be interviewed for this study. I am doing a follow up interview to the survey you responded to titled, "Survey of Internet-enhanced Learning in Georgia Secondary Agricultural Education." I am trying to determine how extensive is the use of the Internet to enhance the classrooms of Georgia Ag Teachers, how the internet is used, what helps or hinders teachers from using the internet and what professional development ag teacher need I this area. The data shows that 98% of surveyed ag teachers use the internet to some extent to enhance learning in their classroom. Would you agree that this is representative of actual internet usage by Georgia ag teachers to enhance learning? Why or why not?
P: I would say yes. I know the ag teachers that I know are using the internet and are using technology to enhance their classroom on a regular basis. You talk to them and get that firsthand account of what they are doing in the classroom on a regular basis. I would agree with that; I'm not surprised by it.
I: Now, respondents gave a small picture of the current uses of the internet in the classroom. They indicated high usage of the internet by students for research and by teachers for CDE preparation, communication, presentation and record keeping. If you do so, how do you specifically use the internet to enhance learning in your classroom?
P: We have record book Wednesday, and every Wednesday my kids have the first 15 minutes of class to update their AET record books or their record books using the AET. Usually when they finish that up I try to have something for them to do since they already have the computer out and I use Google Classroom to fill up the rest of that class period. A lot of times with Google Classroom, its them doing their own research or researching a specific topic that we are working on. My kids in Ag Mechanics do a lot of search on Pinterest for things they would be interested in looking at. Those are the biggest things that I do. At least once a week they are doing that. I also do like the fact, that because it is there, I feel like my kids get more out of me being gone now than they did before when I didn't use that technology. They can use Google Classroom and they can work on stuff just like I was there. Where, in the past, the only thing I could do would be offer a book and questions to answer.
I: I did the same thing when I went to Nationals this year. Lots of time to prep, but …
P: It is over time, but you get where you can reuse posts on Google Classroom and stuff that you've already got done. It becomes easier over time.
I: Now, the survey revealed that those teachers with 20 or less years teaching experience believed they used the internet more effectively in their classrooms and have higher confidence in using the internet than agriculture teachers with 21 or more years of experience. Why do you believe this is so?
P: You know I'm at 18 and I feel I'm probably more lumped in with the 20 or more. It's just technology just was not something when we were growing up. Younger teachers see that it is something that use every day, for a long, long time. So, they are more comfortable with it. I think it's easier for them to pick things up, new things, that are being introduced on a regular basis, whereas older teachers have a harder time adopting new things. Regardless whether it's technology or anything else. You know, I've been doing what I do for 20 plus years so I'm gonna keep doing it.
I: Alright, what can be done to encourage those older teachers to use the internet to

enhance the classroom?
P: It's just like anything else. You are going to have to show them the value of it and the benefit of it before they consider using it. And, you are probably going to have to do some professional development on it, and I really believe the professional development needs to be geared toward the amount of technological use the teacher has. The older teacher is going to need more help than the younger teacher and if you put them all in the same group the older teachers are gonna get lost in the shuffle, so to speak, and that's gonna turn them off to using it even more.
I: We are gonna come back to that professional development, but before we do that, 98% of surveyed teachers did use the internet to some degree to enhance learning in their classroom. Analysis revealed that agriculture teacher with 14 or fewer internet-connected devices in their classroom believed they did not have as sufficient a number of devices in their classroom to access the internet as those in a 1:1 school. Do you have 1:1 or does every student have a device in your school?
P: In my classroom, they do. We were lucky enough to get a STEM grant when I started working there 8-9 years ago. So, we got a classroom set of laptops. The kids each have access, now they are getting a little older. Sometimes a kid has to wait for somebody to get done before they can use it. I can see where if you only 14, you would have to a whole lot more planning to make that work. You'd really have to differentiate your instruction where part of the class was working on something while the rest of the class was working on something together without that technology.
I: Besides access, what other factors, from your own experience, have you found that discourage the use of the internet to enhance learning in the agricultural classroom?
P: The biggest problem for me is finding time to become familiar with something new. They made me a lead instructional teacher for everyone in my school in ag ed, career tech and you show people a million times to do something but unless you sit down and learn and work with it on your own, they are not gonna adopt it. If you don't have the time, they're not gonna do it. So, finding the time is my biggest hurdle.
I: And we both know that ag teachers don't have enough, extra time, that's for dang sure.
P: There are only 24 hours in the day. They aren't making any more of them.
I: Well, on the other hand, what other factors have you found, from your own experience, that encourage the use of the internet to enhance learning in the agricultural classroom?
P: As soon as they see the value or the benefit it is to them and to their kids. That was one of the main reasons, for instance, that I started using AET. I looked at how much time it was going to save us when it came to proficiency and degree applications and things of that nature and that benefit to me was huge because it saved me a lot of time. At the same time, I had to rearrange some things and do some things differently to make that work, long term, it really does save me a lot of time.
I: Last section here, most teachers learned how to use the internet from their own independent learning and interaction with other teachers rather than from heir degree work. Where have you learned how to use the internet in your classroom?
P: Trial and error doing it on my own. That's pretty much it. Or I get to talk to another, younger teacher usually. I get to talking with them about something they've done in class and what's worked for them and I then go back and look into it and research it myself. And then there's some things that folks in my school system are the same way we got

some folks that are really good about using technology in the classroom and I talked to them about how they use it and what they do we did.
I: So, y'all don't have any professional type development, faculty meetings or anything like that?
P: We did, when we were going through the STEM program with our STEM grant, that was one of the requirements of the grant, that we get professional development on using technology. I don't know that that wasn't a springboard for me. Because doing that I learned to do different things and saw how easy it worked and I started implementing other things after that, on my own. I'd see something and look into and see what it would take to do this. That's the biggest thing, that a lot of teachers don't look into what it takes to make it work. They just assume it's gonna be too much or they don't have the time, so they never get started.
I: What advice or recommendations do you have for professional development so that you and other teachers may improve using the internet to enhance the classroom?
P: As far as design of professional development, I think it needs to start small, so you start with one thing and figure out how you can add to that one thing. Or add to one class and then over the period of the next year add to another class. It's something that involves continuous growth and development. As far as designing, from a teacher's perspective, I think you've got to find something simple to start with, something with a big payoff, as far as the benefits go to the teacher and the students. Starting off with something like that and then allowing the teacher to find other things that they want to use from there is the probably the best way to go.
I: A couple other people I interviewed said that, like at teacher's conference, the best thing we can do to help teachers is to have, like you said, is to have one thing, do one thing. Don't use 20 different things, use one thing to go into depth how teachers use it, how to set it up. That would be much more beneficial than trying to cover 30 different things in 30 minutes.
P: And, that goes back to what I was saying about different audience. There are younger teachers who are using technology already, that would probably benefit from hearing 30 things, you are gonna pick up some and go back and look at them yourself, but older teachers that are not using a lot of it already, it needs to be one thing and that's it … like Google Classroom.
I: Yeah, I definitely think we need to have a beginners Google Classroom class and then there needs to be an advanced one for people who are already using it and maybe some things they don't know how to use. There are some things I started doing this year that I never did before that are pretty awesome.
P: Yeah, and it gets to be that way every year with me using Google Classroom. You can add to Google Classroom so much as time goes on.
I: Well, [REDACTED] I sure do appreciate you giving up your time and participating. I hope you have a good rest of your holidays and have a safe trip back.
P: You are welcome. Bye
I: Alright, bye.