Integration of Technology into Student Assignments by Family and Consumer Sciences Teachers

by

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Abstract

The purpose of this study was to provide information that may improve or design technology professional development for family and consumer sciences teachers to integrate technology into student assignments. This study was designed to investigate (a) the extent to which Alabama family and consumer sciences teachers are requiring students to utilize technology to complete assignments, (b) the factors that influence Alabama family and consumer sciences teachers' decisions to assign projects that require students to use technology to complete projects, and (c) the degree of confidence Alabama family and consumer sciences teachers have in their ability to design projects that require students to use various technologies to complete projects.

Data were analyzed using the following statistical procedures: descriptive, regression, Analysis of Variance (ANOVA), and Pearson product-moment correlation. The majority of respondents were female (99.1%, n = 114). The mean age of respondents was 44.78 years. Fifty-six percent (56.5%, n = 65) hold a masters degree or higher. Forty-four percent (44.3%, n = 51) of respondents taught in rural areas, and 58.2% (n = 67) have taught more than 10 years. A majority of respondents (80.7%, n = 92) reported a constructivist teaching philosophy.

Respondents reported using the computer, Microsoft Office, printer, and LCD projector as the technology tools required by students to complete assignments at least monthly. Conducting research was the technology assignment most often required of students monthly.

Perceived behavioral control was the best predictor of family and consumer sciences teachers' intentions to require students to use technology to complete assignments. Demographic variables of this study did not yield a significant difference in the requirement of technology use in student projects by teachers.

The Pearson *r* correlation between confidence level and technology tools was statistically significant, $r = .550$, $p < .001$. The Pearson r correlation between confidence level and technology assignments was statistically significant, $r = .467$, $p < .001$. Results indicate that teachers do not feel confident in their ability to design projects that require more current technology.

In this study, forty-one percent family and consumer sciences teachers reported receiving specific training to integrate technology for student learning. This indicates a need for technology professional development specifically geared towards the family and consumers sciences curriculum and towards the integration of technology for student learning.

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I. Nature of the Problem

Introduction and Background

> When you go to the hardware store to buy a drill, you don't actually want a drill, you want a hole, they don't sell holes at the hardware store, but they do sell drills which are the technology used to make holes. We must not lose sight that technology for the most part is a tool and it should be used in applications which address educational concerns. (Fletcher, 1996, p. 87)

The quotation by Fletcher provides an apt analogy when considering the relationship of technology to student learning. Access to and use of technology in the nation's schools has been identified as priority in the 21st century (The Council Chronicle, 2009; International Society for Technology in Education, 2010). Leaders recognize the need to educate young people in the most effective use of technology in preparation for the workforce. As of 2003, ninety-three percent of all public instructional classrooms reported having access to the Internet, an increase from 3% in 1994. In 2008, 97% of public schools had one or more computers located in instructional classrooms of which 98% of these had Internet access (U.S. Department of Education, 2010).

Preparing students for the workforce does not mean simply providing access to technology. Workforce preparation means teaching students how to maximize the greatest potential of technology to access resources, work cooperatively, solve problems, and think critically. Teaching and developing critical-thinking skills relates to information processing, reasoning, creative thinking, and evaluation. Information processing means bringing information into the mind, manipulating the information, and then responding to the information. Reasoning takes place when individuals make sense of things. Creative thinking requires individuals to use all sources of information to respond to a situation. Merriam-Webster online dictionary defines evaluation “to determine the significance, worth, or condition of usually by careful appraisal and study”.

Studies have shown there are advantages of using technology in the educational process to promote student learning using constructivist philosophy (Astleitner, 2002; Bruning, Zygielbaum, Horn, & Gilder, n.d.). Technology and online tools allow students to work at their own pace without peer-pressure. In addition, technology and online tools allow educators to customize instruction for students based on student abilities and learning styles and to develop higher order thinking skills in their favored learning style (MacKnight, 2000; Murchu & Muirhead, 2005).

Project Tomorrow’s (2007) “Speak Up” survey explored the use of inquiry-based curriculum in science education, including attitudes of students, parents, teachers, and school leaders towards science education. Project

Tomorrow was conducted by an educational nonprofit organization. The survey was administered to 367,756 individuals who included K-12 students, parents, teachers, and school leaders from all 50 states, the District of Columbia, Canada, Mexico, Australia, and American Defense schools. Reported findings indicate that although inquiry-based curriculum is an important and effective means to increase students' scientific knowledge, only 25% of teachers were employing this method in the classroom. Parents of students in all grades indicated that problem-solving and critical-thinking skills were the most important reasons for students to understand science.

In preparation for 21st century jobs, problem-solving and critical-thinking skills are essential for success. Results from Project Tomorrow's (2007) Speak Up survey indicated that only 47% of teachers in grades 9-12 believed their schools were adequately preparing students for 21st century jobs. Furthermore, only 16% of teachers indicated assigning projects that developed problem-solving skills. Technology provides opportunities to engage students in online and interactive resources to develop problem-solving and critical-thinking skills.

In the mid 1990s, The National Council for Accreditation of Teacher Education (NCATE) developed unit standards that required the integration of technology into the pre-service teachers' certification process for their member schools (Southern Regional Education Board, 1998). The International Society for Technology in Education (ISTE) developed the first set of standards to be used to integrate technology into curriculum instruction. The National Educational Technology Standards for Teachers (NETS•T), developed in 2002 and updated in 2008, serve as the recognized technology standards for teachers. ISTE published separate technology standards for students, administrators, coaches, and computer science teachers. During the past three decades, research has been conducted on teachers' attitudes, subjective norms, and self-efficacy towards technology integration. Studies indicate teachers' attitudes toward technology are an important component in determining if technology integration takes place in the classroom (Christensen, 1998; Hsiung, 2001; Stein & Wang, 1988). Teachers' perceptions of what administrators, peers, parents, and students think they should do with technology also impacts a teacher's decision to integrate technology into the curriculum, as does their self-efficacy. In a research study conducted by Wozney, Venkatesh, and Abrami (2006), teachers' confidence was one of the greatest predictors of technology use. The U.S. Department of Education (2003) reported that technology is "now considered by most educators and parents to be an integral part of providing a high-quality education" (p. 3).

In December 2004, the National Association of Teacher Educators for Family and Consumer Sciences developed 10 standards that all preservice family and consumer sciences teachers should master. Standard 6 addresses proficiency of preservice family and consumer sciences teachers regarding technology. Standard 6 states, "Instructional Strategies and Resources: Facilitate students' critical thinking and problem solving in family and consumer sciences through varied instructional strategies and technologies and through responsible management of resources in schools, communities, and the workplace" (National Association of Teacher Educators for Family and Consumer Sciences, 2004, p. 1).

Several states (e.g., Alabama, Georgia, Florida, and North Carolina) now have published technology standards for family and consumer sciences educators. Use of technology in the curriculum is now required by both state and national standards (ISTE; NCATE; Alabama Department of Education Course of Study, 2009; Georgia Department of Education; Florida Department of Education; North Carolina Department of Education).

The requirement to integrate technology into the classroom to advance student learning requires time, training, and resources. Problem-based learning has always been a part of the family and consumer sciences curriculum and serves as a platform to integrate technology standards that will link knowledge and skills to career opportunities in the 21st century. With this integration, family and consumer sciences educators have the opportunity to demonstrate the importance of their discipline, solidifying its continuation in the secondary education curriculum as a platform for improving student learning.

Theoretical Framework Introduction

The theory of planned behavior (TpB) (Ajzen, 1991) is the theoretical framework that guided this study. The TpB is "designed to predict and explain behavior in specific contexts" (p. 181). Attitude, subjective norm, and perceived behavioral control are determinants of an individual's intention.

In the present study, the specific behavior is family and consumer sciences teachers' integration of technology into student assignments. This specificity level is different from integration of technology into the classroom. The three constructs may vary in importance depending on the research study (Ajzen, 1991). It is important to know what factors influence an individual's intention to perform a certain action. School leaders and university teacher education programs would benefit from knowing what influences teachers and preservice teachers to integrate technology into student assignments. Technology training and education courses that focus specifically on these factors may potentially impact teachers' intentions.

Statement of the Problem

In our society, technology is a permanent part of daily life, including education. Beelend (2006) and Gormley-Heenan and McCartan (2009) reported that use of technology in the classroom increased student interest in courses and fostered student engagement. Research indicates a positive link between student engagement and increased student achievement (Gormley-Heenan & McCartan, 2009; Markwell, 2007). Studies have not been conducted to identify the extent to which Alabama family and consumer sciences teachers require students to utilize various technologies to complete assignments or to what extent Alabama family and consumer sciences teachers are interested in professional development in this regard. The preferred method of obtaining professional development for family and consumer sciences teachers is unknown also.

Purpose of the Study

Educational technology can be utilized for the delivery of instruction and enhancement of learning. This study was designed to investigate (a) the extent to which Alabama family and consumer sciences teachers are requiring students to utilize technology to complete assignments, (b) the factors that influence Alabama family and consumer sciences teachers' decisions to assign projects that require students to use technology to complete projects, and (c) the degree of confidence Alabama family and consumer sciences teachers have in their ability to design projects that require students to use various technologies to complete projects. Although most classrooms are equipped with technology, not all educators have been utilizing technology to make significant changes in instruction that lead to increased student academic achievement (Project Tomorrow, 2007).

The purpose of this study is to provide information that may be utilized to improve or design professional development specifically targeted at integrating technology into student assignments. Furthermore, the information may be utilized by colleges of education in curriculum planning to prepare family and consumer sciences teachers to more effectively integrate technology into student's assignments.

Statement of Significance

The significance of the study lies in the fact that there is a gap between the availability and access to technology and the use of that technology in strategic ways related to pedagogy and curriculum planning to improve student learning and higher order thinking. Ultimately, the outcome of the study may have a positive impact on student engagement and enhanced student learning and higher order thinking related to improved teacher performance and compliance with state and national standards (Project Tomorrow, 2007).

Research Questions

The following research questions were designed to address the statement of the problem.

1. To what extent are family and consumer sciences teachers requiring students to utilize technology to complete assignments?
2. To what extent does attitude, subjective norm, and perceived behavioral control predict family and consumer sciences teachers' integration of technology into student assignments?
3. Is there a significant difference in the requirement of technology use in student projects among demographic groups: (a) age, (b) years teaching family and consumer sciences, (c) highest degree, (d) location of campus, and (e) perceived teaching philosophy?
4. To what extent does teacher confidence impact student assignments that require technology use?

5. In what format do family and consumer sciences teachers desire to receive professional development?

Definition of Terms

The following definitions are provided for the purpose of the present study.

Attitude. "Attitude refers to the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question" (Ajzen, 1991, p. 188).

Blog. A web log that serves as an online commentary written by the creator/author on topics they chose to share. Readers of the blog may reply and have online dialogue with the blog author.

Constructivist Teaching Philosophy. A teaching philosophy that refers to the belief that knowledge is constructed by learners through active and meaningful engagement with subject matter.

Digital Book (also known as e-books). An online version of a full-length printed book. Digital books may be read on specific e-book readers, some mobile phones and personal computers.

Family and Consumer Sciences. A multidisciplinary, integrative field of study with a unique focus on individuals, families, and communities.

Hardware. The physical parts of a computer.

Internet. A worldwide computer network that allows individuals to locate, use, and share information with other users.

Learning Outcomes. The measurable cognitive dimension that occurs through the learning process.

Perceived Behavioral Control. Perceived behavioral control (PBC) “refers to the perceived ease or difficulty of performing the behavior and it is assumed to reflect past experiences as well as anticipated impediments and obstacles” (Ajzen, 1991, p. 188).

Podcast. A type of digital media that allows an audio file to be played back on a computer or mobile device such as Mp3 players.

Project-based Learning. A “systematic teaching method that engages students in learning essential knowledge and life-enhancing skills through an extended, student-influenced inquiry process structured around complex, authentic questions and carefully designed products and tasks” (Project Based Learning, para. 6).

Self-efficacy. “Beliefs in one’s capabilities to organize and execute the courses of action required to produce given attainments” (Bandura, 1977, p. 3).

Simulation. An on-line simulation is a computer-driven re-creation of a real experience.

Software. A computer program or set of instructions. System software tells the computer what to do. Application software allows individuals to complete activities such as word processing, spreadsheets, multimedia presentations, simulations, and games.

Subjective Norm. Subjective norm refers to “the perceived social pressure to perform or not perform the behavior” (Ajzen, 1991, p.188).

Technology. A tool created by humans that can be used to assist in producing products and presentations, researching information, and solving problems.

Technology Integration. Integration occurs when teachers use technology to introduce, extend, enrich, and assess content to enhance student learning.

Theory of Planned Behavior. Icek Ajzen’s theoretical framework developed to explain an individual’s intention to perform a given behavior. “The Theory of Planned Behavior postulates three conceptually independent determinants of intention…attitude toward the behavior… subjective norm…perceived behavioral control” (Ajzen, 1991, p. 188).

WebQuest. An inquiry-oriented lesson in which the majority of the information used by learners for the lesson is located on the Web.

Wiki. A site on the Internet that allows users to publish content directly to the Web, edit existing content, and view previous content. In the education area, Wikis offer a means for students to work collaboratively to create, edit, and integrate content information in an accessible digital space.

Limitations

The limitations of the present study are the conditions beyond the control of the researcher that may place restrictions on the conclusions of the study and applications to other situations. Limitations of this study include (a) survey response rate, (b) a self-reporting survey instrument, (c) a lack of homogeneity among the sample of family and consumer sciences educators in Alabama based on curriculum taught, and (d) survey respondents could mark multiple choices for technology training (survey question 13).

School districts in Alabama differ in the program of family and consumer sciences curriculum taught. Schools have the option to teach the human service cluster, hospitality and tourism cluster, and/or the education and training cluster. Content in some clusters is more easily adaptable to technology than content in other clusters that may require more training, time, and resources. Schools also differ in the number of family and consumer sciences educators in family and consumer sciences departments. Technological ability differs among teachers and technology availability differs among schools.

Assumptions

The following assumptions were made in regard to this study:

1. Respondents to the survey provided honest and accurate answers to the Family and Consumer Sciences Technology Integration Questionnaire.
2. Respondents understood the questionnaire.

3. The Family and Consumer Sciences Technology Integration Questionnaire was the appropriate tool for this study.
4. Sufficient data were provided by the 126 study respondents.

Delimitations

Delimitations are the boundaries within which the study is concerned. The present study involves only Alabama family and consumer sciences teachers teaching Grades 7-12.

II. Review of Literature

The review of literature comprises the following major topics:

1. Introduction;
2. Technology and student engagement;
3. Technology and higher order thinking skills;
4. Technology and constructivist pedagogy;
5. Technology and demographics;
6. Technology and standards;
7. Teacher professional development;
8. Theoretical framework;
9. Summary

Introduction

Since the introduction of computers, researchers have studied the impact and the potential impact of technology in the educational setting. Increasing the availability of and access to technology was a major priority when computers first began to be used in schools. These goals are reflected in the following statements by the National Center for Education Statistics (U.S. Department of Education, 2005).

> In fall 2003, nearly 100% of public schools in the United States had access to the Internet, compared with 35% in 1994…. In 2003, 93% of

> public school instructional rooms had Internet access, compared with 3% in 1994. (p. 4)
>
> In 2003, the ratio of students to instructional computers with Internet access in public schools was 4.4 to 1, a decrease from 12.1 to 1 ratio in 1998, when it was first measured. (p. 7)

Both national and state standards have been established to improve teachers' technology proficiencies. For example, ISTE, the National Council for Accreditation of Teacher Education (NCATE), the National Association of Teacher Educators for Family and Consumer Sciences, and the Alabama State Department of Education have included technology integration components into their standards for teachers' technology knowledge and skills upon completion of an accredited teacher education program. Technology tools of today may soon be obsolete; therefore, understanding the importance of developing skills that can be used for both present and emerging technology is paramount.

Results of Speak Up 2009, a national research project conducted by the nonprofit national educational organization Project Tomorrow, reveal the impact technology is having on student learning.

> Teachers tell us that as a result of using technology in the classroom students are more motivated to learn (51%), apply their knowledge to practical problems (30%) and take ownership of their learning (23%). Teachers also report that by using technology students are developing key 21st century skills including creativity (39%), collaboration (30%)

> and skills in problem-solving and critical-thinking (27%); thus, effectively preparing them for future success in the workplace and the global society. Teachers also see changes in their teaching practice as a result of technology integration within instruction. (Project Tomorrow, 2010, p. 2)

Also, in Speak Up 2009, teachers indicated that technology has changed their classrooms to a more student centered learning environment, and the teachers report creating more interactive lessons for the students (Project Tomorrow, 2010).

Technology and Student Engagement

Technology has changed the way individuals live today. Technology is used in every facet of society, including home, school, work, and leisure activities, and has become a permanent part of life. In school, teachers play a key role in improving student learning using technology. Use of technology in the classroom provides a platform for student engagement, that is further linked to increased student achievement (Carini, Kuh, & Klien, 2004; Gormley-Heenan & McCartan, 2009; Kay & Knaack, 2009; Markwell, 2007). Markwell (2007) states “student engagement is the extent to which students are actively engaged—actively committed to and actively involved in—their own learning” (p. 2). “Student engagement is important because it enhances…the quality of the student learning experience” (p. 4).

Authentic, rich learning tasks can be designed with technology to support and enhance student engagement thereby increasing student learning and achievement. Current research supports the use of virtual learning environments where students have “the ability to assume a different persona to experience the world of another” (Duechar & Nodder, 2003). A few advantages of virtual learning environments are the ability to use the discovery approach to learning for analysis of the problem encountered, and to teach material that is difficult to teach in traditional lecture format (Foreman, 1999).

Technology fosters student engagement by allowing students to have a voice without fear of embarrassment or being singled out (Gormley-Heenan & McCartan, 2009). Beeland (2006) and Gormley-Heenan and McCartan (2009) found that various types of technology such as audience response systems and interactive whiteboards increased interest in courses and kept students more alert in class. Project Tomorrow (2007) reported that teachers saw animations and simulations as two technology tools that had the greatest potential to increase student achievement. Accordingly, Niemuth (2010) states students spend an average of three hours a day on the Internet. Because students are already spending several hours per day on the Internet, using the technology and the Internet to enhance education appears to be a natural fit. When technology is familiar to students, engagement increases; however, technology itself cannot produce dynamic student engagement without strategic use within the pedagogic process (Banks, 2006).

Technology integration is not merely an add-on to the classroom; technology integration offers a way to present and experience course content in a different manner. The growth in the Internet over the past decade has opened up many free, online resources. Educators have access to innovative and interactive online resources that can be used to create or adapt lesson plans, games, simulations, and many other resources and materials to support discipline specific content and provide problem based learning experiences. Lesson plans for the family and consumer sciences classroom that integrate technology to advance student learning might include animations, games, simulations, digital textbooks, and virtual fieldtrip. Links are available to reference materials, specific collections of materials assembled by instructors, and resource collections such as The Digital Library for Earth System Education, the National Science Digital Library, Teachers' Domain, and the U.S. Department of Education Learning Registry.

Animations. Animations are sequential images that offer explanations of concepts. Animations often accompany textual information covering the same material. Jones and Bartlet, a textbook publisher, offers online animations that may be utilized in classrooms. For instance, in a family and consumer sciences nutrition class, students interested in sports nutrition can see a visual representation of how the body utilizes carbohydrates, proteins, and fats during exercise activity. Currently, the website for this animation can be accessed by logging into http://nutrition.jbpub.com/resources/animations.cfm.

Games. Interactive video games and serious games have received support in the published literature as popular tools for supporting curricula objectives (deFreitas, 2006). For example, deFreitas stated that “game play is about problem solving, applying ingenuity, anticipating the programmer’s challenges, and their humour, in a tough cycle of ‘observe, question, hypothesis, test’ that any science teacher would be ecstatic to see evidenced” (p. 4). For decades, policy makers did not take notice of the benefits of game play; however, with the beginning of the 21st century, a partnering between education and the gaming industry began. Educators noted the opportunities that games offered in multiple learning styles and challenges. The game industry recognized how games can impact the love of learning. In reviewing the literature, deFreita found that for games to be effective in the learning process, the learner must be engaged, motivated, supported, and interested in order to support curricula outcomes. Online games allow students to interact with others from across the city, state, country, and world bringing diversity into the dynamics of learning. Games allow situations to be replayed with different settings, conditions, and groups to see how the end result may change. Although games may have positive outcomes for curricula goals, schools may have difficulty keeping up with changes in hardware to support graphics required for new games.

With the growing demand in the gaming industry, higher education institutions have recognized the need for game studies majors and minors. A sample of universities that offer game studies majors or minors according to each institution's current website are the University of Montevallo (http://www.montevallo.edu/news/GameStudiesMinor.shtm), Miami University (http://aims.muohio.edu/game-studies-minor/), University of Southern California (http://cinema.use.edu/degrees/minor/videogame.cfm), Savanna College of Art and Design (http://www.scad.edu/interactive-design-and-game-development/), and Rochester Institute of Technology (http://www.rit.edu/programs/game-design-and-development).

Simulations. Simulations assist students in learning about real-world experiences without suffering harm. Simulations are available in many formats (i.e., CD-Rom, DVD, and downloaded files from the Internet) and may also be accessed directly through the Internet through computers, smart phones, and digital tablets. The University of Colorado at Boulder hosts a collection of online simulations by grade level in the following subjects: physics, biology, chemistry, earth science, and math. Currently in the biology section, students may download a simulation demonstrating the interaction of eating and exercise at: http://phet.colorado.edu/en/simulation/eating-and-exercise.

Digital Textbooks. Digital textbooks are finding their way into the education setting. With the quality and portability of communication devices (e-book readers, laptops, Ipad, Ipod, mobile phones, etc.), the advantages of having a printed textbook over a digital textbook are declining. Advantages of digital books include the ability to print pages on demand, interactive capability, availability and quantity of information, and the appeal it offers to individual learning styles (Davy, 2007). Students can read, highlight, and print information on an as-needed basis. Currently, digital textbooks may be more appropriate for university students and private school students than public school students because they are required to purchase textbooks. However, even in the public schools, literature classes often require students to purchase novels for use in class, and digital books may be appropriate.

Virtual Fieldtrips. Technology enables teachers and students to visit places that otherwise may not be accessible due to distance or expense. Virtual fieldtrips can be taken prior to actual fieldtrips and used as part of the planning process. Examples of virtual fieldtrips include the Google Art Project, U.S. History.org, a Century in Shoes.com, the White House, and the Tower of London. Although virtual field trips offer many advantages for teachers and students, virtual field trips have their disadvantages, as well. Virtual field trips cannot provide all five sensory experiences that can be experienced on a live field trip. Sight and sound sensory experiences are the only experiences of a virtual field trip that precludes touch, smell, and taste (Robins, 2008).

Reference Materials. The Internet hosts a plethora of reference materials related to all subject areas in family and consumer sciences. Of interest to the high school curriculum would be information related to child and family studies, financial literacy, health and wellness, nutrition, culinary arts, fashion merchandising, and interior design. An excellent resource for interior design content provided by the Interiors Design Educators Council is currently accessible at: http://www.idec.org/education/Interiordesignteaching resources.php. Philadelphia University offers a wealth of textile resource information in one collection that is currently accessible at: http://www.philau.edu/library/resources/ textiles.html. An excellent online resource for nutrition information is the California Department of Education, currently accessible at http://cde.ca.gov/ls/nu/he/nuredres.asp.

While many technology resources are available to support student learning, it is also important to understand the best instructional practices indicated for each type of technology. This is an area that needs further research, as “little is known about what kind of instructional practices best support student learning with online resources” (Recker, Sellers, & Ye, 2012, p. 2).

Technology and Higher Order Thinking Skills

Technology use in the classroom generates much debate even in the technological society of today. Teachers are concerned about how to incorporate technology into their lessons, and administrators worry about the expense of technology. How do I incorporate technology into an already full schedule? Should every student have access to technology? What technology will students need to prepare themselves for the workforce? How do we stay current with the latest technology? These questions are but a few that are being addressed by teachers and administrators on a daily basis.

Technology is a part of education in many ways. Technology is used for instruction, evaluation, administration, and communication. Educators and researchers, as well as business leaders, recognize the importance of encouraging students to be lifelong learners and to use complex thinking skills. It is important that preservice and inservice teachers are skilled in using technology effectively to enhance student learning, that includes higher order thinking skills. For over 50 years, educators have been trained to incorporate higher order thinking skills into the classroom using Bloom's Taxonomy. When integrated into the curriculum, technology can be a tool to enhance higher order thinking skills of students. A large amount of research indicates the positive effect of technology on the advancement of higher order thinking skills of students (Hopson, Simms, & Knezek, 2001; Yeh, 2009). When using technology for enhancement of higher order thinking skills, the focus should be on the appropriate instructional strategy and integration rather than on the technology itself (Abrami, 2001; Mandernach, 2006).

Mandernach (2006) found two benefits for utilizing online instructional technology to enhance student learning and specifically higher order thinking skills of students. In addition to fostering a constructivist teaching philosophy, technology provides more time for students to devote to higher order thinking activities beyond the boundaries of a time-constrained classroom. Mandernach (2006) indicated the use of online threaded discussions allowed students to plan meaningful discussions that facilitated higher order thinking differently than spontaneous face-to-face discussions.

Similarly, Gelder (2001) participated in developing the *Reason!* project. The *Reason!* project developed a new approach that uses technology in practicing critical-thinking skills. Students in a philosophy class were given a pre - and - post test using an argumentative writing assignment and the *California Critical Thinking Skills Test*. Gelder found that through the use of the *Reason!Able* software program, students improved their higher order thinking skills by allowing practice in critical evaluation and argument production.

Technology and Constructivist Pedagogy

Technology itself cannot provide innovative educational change. Bazeli (1997) asserts that the technology itself is not as important as how the technology is included in curricular applications. It is the skilled pedagogical application of educational technology by teachers that creates change. When students are involved in the planning and implementation phases of technology integration "the burden is lifted from teachers and the learning process becomes collaborative, with the teacher assuming the role of facilitator rather than a disseminator of information" (p. 2). Furthermore, this active engagement as collaborators further fosters the acquisition of "critical thinking and problem-solving skills along with curricular learning" (p. 2).

Learning environments designed around the constructivist philosophy give students more responsibility for their own learning than classrooms designed around the traditional behaviorist philosophy (Howard, McGee, Schwartz, & Purcell, 2000). "In the constructivist model, learning is seen not as a transmission of information from teacher to student but as an active problem solving process in which that learner builds on his or her own prior understandings to constructing new knowledge” (Barron & Goldman, 1994, p. 82). Therefore, teachers take on a new role, facilitator of learning, rather than deliverer of information.

Teachers’ teaching philosophy is not always aligned with their teaching practices. Chen (2008) investigated this alignment and reported that study participants identified with constructivist instruction; yet, when observed in the classroom, their instructional methods were in contrast to this teaching philosophy. “Classroom observations, collected documents, and interviews indicated that most participants did not integrate technology into instruction in ways to facilitate students’ problem-solving, collaborative or cooperative learning, and self-regulated learning” (p. 69). The participants reported using technology for administrative work, planning, and personal work, but participants did not see technology as a means to reach curricular goals (Chen, 2008).

The presence of technology in a classroom does not mean it will be used effectively (Bradshaw, Biship, Gens, Miller, & Rogers, 2002; Kiraz & Ozdemir, 2006). The use of educational technology is related to changes in teacher practices. Some teachers prefer a more constructivist classroom and invest the time and energy necessary to integrate technology into the curriculum because they believe technology promotes a constructivist learning environment (Howard et al., 2000). Teachers that promote a student centered learning environment have moved from the “sage on a stage” tradition to a new “guide on the side” facilitator. Liu and Szabo (2008) state that “the usefulness of technology in classroom teaching resides in the fact that technology can take the place of real-life experiences through simulations, games, discover, and problem solving” (p. 6).

Technology and Demographics

In a study by Inan and Lowther (2010), 1,382 participants completed a two-part instrument developed to access factors affecting technology integration in K-12 schools. Inan and Lowther created a path model in an attempt to explain the factors affecting technology integration in K-12 schools. The path model results indicated that age and years of teaching negatively affected technology integration and technology proficiency. Mathews and Guarino (2000) surveyed 55 Southeastern Idaho school districts of which an estimated 3000 teachers participated to examine factors predicting teachers’ computer use. The results from the study revealed that gender, years of experience (teaching), number of computers, and computer proficiency had a direct effect on computer use whereas years of experience had a negative effect on computer proficiency. Bebell, Russell and O’Dwyer (2004) found that new teachers and experienced teachers (11 plus years) report the frequency of technology use at almost the same levels. Technology use in schools is a complex web. Many factors contribute to the use or non-use of technology in the classroom and demographic variables should not be over looked.

Technology and Standards

Technology standards developed by national, state, local educational agencies, and accrediting bodies are addressed at every level of education. The No Child Left Behind (NCLB) Act of 2002 set levels of accountability in order to close the achievement gap of students (U.S. Department of Education, 2002). NCATE and ISTE have created technology standards to advance the education of preservice teachers in teacher education programs (TEP). In most states across the nation, preservice teachers are required to take a technology course prior to receiving teacher certification. Is one course sufficient to teach preservice teachers about technology and how to integrate it effectively? Kumar and Kumar (2003) suggest that “although a single computer course may be enough to teach students some basic computer applications, this isolated course is not enough to prepare teachers to use technology in their instruction” (p. 87).

It is important for education faculty members to design learning outcomes that meet NCATE technology standards and explain the process to preservice teachers. The ISTE standards should be made known and demonstrated to preservice and inservice teachers in all disciplines. The ISTE standards are typically well known in the business education and technology education certification programs because of the nature of the programs but may not be emphasized to the same degree in other education programs, such as family and consumer sciences. ISTE has published separate standards for teachers and students, as well as for other groups.

The National Educational Technology Standards and Performance Indicators for Teachers (NETS•T) written in 2008 are reprinted as follows:

1. Facilitate and Inspire Student Learning and Creativity: Teachers use their knowledge of subject matter, teaching and learning, and technology to facilitate experiences that advance student learning, creativity, and innovation in both face-to-face and virtual environments.
2. Design and Develop Digital-Age Learning Experiences and Assessments: Teachers design, develop, and evaluate authentic learning experiences and assessments incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes identified in the NETS•S.
3. Model Digital-Age Work and Learning: Teachers exhibit knowledge, skills, and work processes representative of an innovative professional in a global and digital society.
4. Promote and Model Digital Citizenship and Responsibility: Teachers understand local and global societal issues and responsibilities in an evolving digital culture and exhibit legal and ethical behavior in their professional practices.
5. Engage in Professional Growth and Leadership: Teachers continuously improve their professional practice, model lifelong learning, and exhibit leadership in their school and professional

community by promoting and demonstrating the effective use of digital tools and resources. (ISTE, 2010)

The National Educational Technology Standards and Performance Indicators for Students (NETS•S) written in 2007 are reprinted as follows:

1. Creativity and Innovation: Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
2. Communication and Collaboration: Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
3. Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.
4. Critical Thinking, Problem Solving, and Decision Making: Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
5. Digital Citizenship: Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
6. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems, and operations. (ISTE, 2010)

In February 2011 a group of Alabama family and consumer sciences teachers attending the Alabama Family and Consumer Sciences State Meeting were asked informally if they were familiar with the ISTE technology standards for teachers (NETS•T) and students (NETS•S) (personal communications, February 17, 2011). The reply was unanimous, “No.” After a review of the 2008 Alabama Course of Study for Family and Consumer Sciences, it appears that Alabama’s Family and Consumer Sciences standards for technology use are stated differently than standards set forth by ISTE and the Association of Teacher Educators for Family and Consumer Sciences, which has the potential to cause confusion among teachers. Examples of technology standards listed for family and consumer sciences courses in the current Alabama Career and Technical Course of Study include:

- Assess the impact of technology on the food industry;
- Analyze ways technology impacts and is used to study the growth and development of children;
- Utilize technology to manage and operate an effective child services program;
- Assess ways technology impacts consumers and consumer services;
- Describe technology used in providing dietetics and nutrition services;

- Utilize technology to create artwork and products in an appropriate design field;
- Assess ways technology is used to impact an early childhood education program;
- Evaluate the impact of technology on the family. (Alabama Department of Education, 2008)

As stated above, the wording of some of the standards does not necessarily indicate that a student would use higher order thinking skills to complete the learning outcome. Although it is ultimately up to teachers to design learning experiences that utilize technology to advance student learning, without specific mandates to do so, teachers may not put forth the time and effort necessary to integrate technology for the purpose of the advancement of students' critical thinking.

Teacher Professional Development

Professional development is a lifelong learning activity. With the speed of societal change and the increased accessibility to worldwide knowledge, policy makers, administrators, and educators realize that even the best initial teacher education programs cannot equip an individual with all the knowledge and skills needed throughout a professional teaching career, especially with the rapid advancement in the technology field. A shift in the thought process of professional development is in order. Professional development opportunities should not be viewed as a one time opportunity to demonstrate a new skill or deliver educational procedures. Professional development should be a continuous development of teachers' knowledge and skills that impact student learning outcomes. This is especially true with technology and technology integration. Teachers are learners, too.

In *Oversold and Underused* (2001*),* Cuban argues that the amount of money and time that has been spent on new technology has not yielded the promised development in academic achievement. Becker (2000) counters Cuban's arguments.

> Thus, in a certain sense Cuban is correct—computers have not transformed the teaching practices of the majority of teachers, particularly teachers of secondary academic subjects. However, under the right conditions—where teachers are perfectly comfortable and at least moderately skilled in using computers themselves, where the school's daily class schedule permits allocating time for students to use computers as part of class assignments, where enough equipment is available and convenient to permit computer activities to flow seamlessly alongside other learning tasks, and where teachers' personal philosophies support a student-centered constructivist pedagogy that incorporates collaborative projects defined partly by student interest—computers are clearly becoming a valuable and well-functioning instructional tool. (p. 29)

The realization that technology has great potential for use in the classroom is not debated. Ensuring that teachers will use the technology available may be the issue. In 1995, Levine urged teachers to take full advantage of technology.

> We have to become so familiar with new technology that we can move beyond its glitter and begin to creatively exploit the uses of the technology to better facilitate learning. And, we must do this in ways that are highly valued by the learner. Taking advantage of new technology can't be merely a matter of saving money, or saving space, or saving time. It has to be a matter of improving the learning potential of people. (para. 8)

Over the past two decades, school systems have focused on acquiring computer hardware and software and providing the training to use this technology. However, knowing how to use technology hardware and software is not enough to ensure effective integration of technology into the classroom to improve student achievement. It is time to move beyond acquisition to full integration with the goal of increasing student learning. Technology, with all the potential it offers, cannot deliver the desired outcomes until it is used and used well (Hall, 2010).

Deciding to use technology in school systems is a complex issue. Decisions about technology are typically made by administrators, not teachers. Issues that affect technology use include the infrastructure of the school, memory of the technology, and bandwidth necessary to operate the technology. Learning to integrate new technology into the classroom and ultimately into student outcomes takes time and training (Hall, 2010). In the past, the vision for integrating technology into the curriculum had not been articulated well and teachers often rejected the idea. As technology has become the norm, technology professional development is undergoing a transformation. Teachers need assistance in effective means of integrating technology into the curriculum to advance student achievement. Technology professional development is the natural link to improving technology integration.

Hall (2010) states “Change should not be considered in terms of adoptions. Instead change needs to be thought about as a process of implementation” (p. 234). With the rapid growth in technology, both hardware and software, professional development that is less focused on “how to use” technology and more focused on the connection between technology, pedagogy, and content has the potential to alter the way teachers teach and ultimately students learn.

Technology professional development is costly and the investment is growing. Policy makers are seeking research to provide evidence that investment is leading to increased student learning. One of the most significant findings in a study conducted by Ingvarson, Meiers, and Beavis (2005) indicated that professional development designers fail to incorporate “opportunities for feedback and coaching in the workplace, despite research on their centrality to learning new and complex skills” (p. 18).

Plair (2008) introduces the idea of a knowledge broker for the purpose of ongoing teacher professional development. The “knowledge broker with a combination of pedagogical, content, and technological knowledge could more effectively and efficiently scaffold instruction, match tools to content, and keep pace with innovations" (p. 72). Furthermore, Plair identified the following advantages that knowledge brokers offer that fit with what teachers need and want when integrating technology. A knowledge broker:

- supplements the information available to teachers by attending conferences, participating in collaborative efforts with other tech-savvy teachers, and staying current with the latest literature;
- has time to prepare and fine-tune technology-related activities;
- has time to learn about various technologies and how to effectively infuse them into the content;
- can help with the assimilation of what may seem foreign into something usable and manageable in the classroom;
- can be available when they (teachers) introduce new technology-rich lessons to students…and available to share their reflections on the merits or weaknesses of a technology-rich lesson;
- will take the lead in coordinating ways teachers can come together to learn about technology. (pp. 72-73)

Knowledge brokers would be a source of ongoing professional development that meet teachers where they are and support the technology integration process.

Theoretical Framework

Icek Ajzen's (1988) Theory of Planned Behavior (TpB) is the framework used to guide the construction of the study questionnaire to measure the integration of education technology by family and consumer sciences teachers. According to Ajzen (1991) "a central factor in the theory of planned behavior is the individual's *intention* to perform a given behavior… As a general rule, the stronger the intention to engage in a behavior, the more likely should be its performance" (p. 181). Ajzen states that

> the Theory of Planned Behavior postulates three conceptually independent determinants of intention. The first is the *attitude toward the behavior* and refers to the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question. The second predictor is a social factor termed *subjective norm*; it refers to the perceived social pressure to perform or not to perform the behavior. The third antecedent of intention is the degree of *perceived behavioral control* which … refers to the perceived ease of difficulty of performing the behavior and it is assumed to reflect past experience as well as anticipated impediments and obstacles. (p. 188)

Behavioral beliefs, normative beliefs, and control beliefs are three salient beliefs that the TpB posits as determinants relevant to a person's behavior.

Behavioral beliefs of family and consumer sciences teachers are linked to their attitude, positive or negative, towards using technology to advance student learning. Normative beliefs held by family and consumer sciences teachers are shaped by their motivation to comply with administrators, peers, and other stakeholders that expect or require them to use technology to advance student learning. Control beliefs are the family and consumer sciences teacher's beliefs concerning the presence or absence of technology for their use as well as their students use. The control beliefs lead to the family and consumer sciences teacher's perceived behavioral control which is their perception of their ability to use technology to advance student learning. Combined, these beliefs form a behavioral intention that is assumed to predict behavior. Figure 1 depicts the relationships between the constructs.

Figure 1. Relationship of Constructs of the TpB

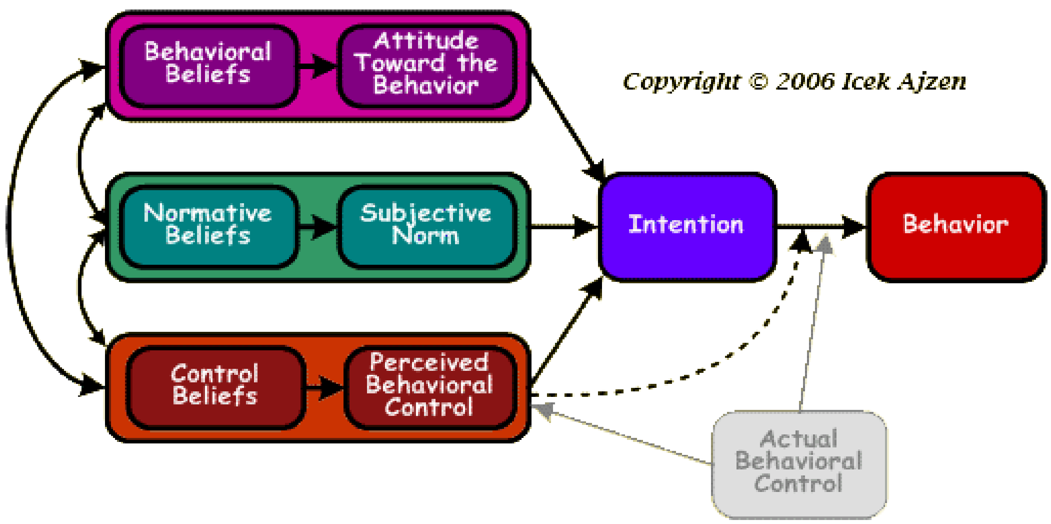

Figure 1. From "TpB diagram," by I. Ajzen, 2006, Icek Ajzen Website: retrieved from http://peiple.umass.edu/aizen/tpb.diag.html. Reprinted with permission (Appendix A)

Based on this theoretical framework, integration of technology by family and consumer sciences teachers can be understood by discerning which of the constructs influences the integration of technology into student assignments.

Summary

The literature reviewed indicated that family and consumer sciences teachers should integrate technology more fully into student assignments. Technology increases students' motivation to learn and allows students to become actively engaged in their education (Markwell, 2007; Project Tomorrow, 2010). Technology is widely used in the educational setting for delivery of instruction, evaluation, administration, and communication. Researchers indicate that technology can have a positive effect on enhancing students higher order thinking skills (Hopson, Simms, & Knezek, 2001) when the proper instructional strategy and integration method is the focus (Abrami, 2001; Mandernach, 2006). A constructivist teaching philosophy is student centered and important in the integration process of technology into the curriculum. The time and energy expended to integrate technology into a more constructivist classroom enhances learning (Howard et al., 2000). Furthermore, technology standards are present in teacher education programs, national education organizations, accreditation organizations, and state courses of study.

No study was found that reported the integration of technology into students' assignments by Alabama family and consumer sciences teachers. Therefore, the present study concentrated on the extent to which Alabama family and consumer sciences teachers required students to use technology to complete assignments, factors that influence teachers' decisions to assign assignments that require technology use, and confidence level of teachers to design assignments that require technology.

III. Methods and Procedures

Introduction

The focus of this study was to investigate the extent to which family and consumer sciences teachers integrate technology into student assignments. Researchers at Auburn University, where the study was conducted, must obtain permission from the Institutional Review Board (IRB) to use the responses of human subjects. The protocol, a request for exempt status, an information letter, and a copy of the survey instrument were forwarded to IRB for approval prior to continuation of the study. The Board reviewed the protocol and granted the necessary permission on July 28, 2011 (Appendix B).

Population

The population for this study included the family and consumer sciences secondary teachers in Alabama. The Alabama Department of Education Family and Consumer Sciences 2011-2012 listserve directory provided the names and e-mail addresses of family and consumer sciences teachers in Alabama. This population (N = 470) included secondary family and consumer sciences teachers. The entire population was surveyed in an effort to maximize the number of surveys returned.

Instrumentation

Data were collected through a researcher-designed survey (Appendix C) entitled, “Family and Consumer Sciences Technology Integration” based on the TpB. The survey instrument was constructed following the manual entitled “Constructing Questionnaires Based on the Theory of Planned Behavior: A Manual for Health Services Researchers,” developed by Francis et al. (2004). The instrument was constructed to gather information regarding the integration of technology into student assignments by family and consumer sciences educators to advance student learning. The survey includes the components (a) attitudes, subjective norms, and perceived behavioral control factors that influence the integration of technology, (b) confidence level of integration of technology, (c) professional development needs, and (d) demographic data.

Items in Section 1 of the instrument were developed to measure constructs that influence family and consumer sciences educators’ intentions: attitude, subjective norm, and perceived behavioral control (Appendix C). On a Likert scale of 1 to 5 (1 = strongly disagree; 5 = strongly agree), Items 1, 2, 3, and 5 were developed to measure attitude. Items developed to measure attitude included:

1. Projects that require students to utilize technology promote student-centered learning and self-discovery;
2. Projects that require students to utilize technology can enhance students’ creativity and imagination;

3. Projects that require students to utilize technology can engage students in collaborative work;
5. Projects that require students to utilize technology allow them to experience real world problem solving more effectively.

Items 6, 7, and 9 were developed to measure subjective norm. Items developed to measure subjective norm include:

6. Colleagues expect me to assign projects that require students to utilize technology to advance their learning;
7. Parents expect me to assign projects that require students to utilize technology to advance their learning;
9. Administration expects me to assign projects that require students to utilize technology to advance their learning.

Items 4 and 8 were developed to measure perceived behavioral control. Items developed to measure perceived behavioral control include:

4. I am confident in my ability to assign projects that require students to utilize technology.
8. It is difficult for me to assign projects that require students to utilize technology.

In Section 2, Item 12 was developed to measure perceived behavioral control. On a Likert scale of 1 to 5 (1 = not at all confident; 5 = highly confident), Item 12 asked participants to indicate their level of confidence in designing projects that require students to use (a) simulations, (b) multimedia presentations, (c) Wikis, (d) WebQuest, (e) flip camera, (f) Mp3 player, (g) iPad, (h) iPod Touch, and (i) Photostory.

Section 3 of the instrument contained questions regarding the participant's educational technology training and their interest in professional development. Participants were asked to check what type of educational technology training they had received from a list of choices comprising (a) no training, (b) basic computer skills, (c) Internet applications, (d) technology integration for delivery of instruction, and (e) technology integration for student learning. Participants had the option to select all options that applied to them. On a Likert scale of 1 to 5 (1 = no interest; 5 = strong interest), participants were asked about their preference for obtaining professional development in a variety of ways, including (a) district professional development meetings, (b) on-campus professional development day, (c) on-line professional development courses, (d) American Association of Family and Consumer Sciences National Conference, (e) Alabama Association of Family and Consumer Sciences State Conference, (f) ACTE Summer Conference, and (g) self-directed learning.

The demographic data in Section 4 included (a) gender, (b) years of teaching family and consumer sciences, (c) highest degree earned, (d) age, (e) grade levels taught, (f) location of school, (g) familiarity with ISTE, and (h) teaching philosophy.

The research method used for the present study was cross-sectional survey research. An electronic survey mode using SurveyMonkey® was selected because of the ability to access e-mail addresses of the target population, and because the target population has access to at least one school computer during the work day. The electronic survey method was selected in an effort to increase response rate. The purpose and importance of the survey were explained in an informational e-mail sent to the population. The survey was constructed using a readable font style and format. Directions for responding and submitting answers to the survey were clear.

As required by the Auburn University Institutional Review Board, an informational letter (Appendix D) was sent via e-mail that described the study to the target population and outlined the procedures for completing the survey. The informational e-mail contained a link to the survey located on SurveyMonkey®.

To ensure confidentiality of participants' responses, data were collected anonymously. IP addresses and e-mail addresses were not collected during the submission of the survey instrument. Responses were collected and maintained by SurveyMonkey® on a secure database.

Permission to conduct the study was granted from the Auburn University Institutional Review Board (Appendix B). Permission was granted from participants by submission of their completed survey.

Validity and Reliability

The basis for the items on the survey was derived from the research objectives of the study and the review of literature. The areas included in the review of literature focused on topics such as student engagement, higher order thinking skills, constructivist pedagogy, and curriculum standards. To establish content and face validity, a panel of experts known for their knowledge and experience in descriptive survey research design, survey instruments, and/or data collection were used to examine the clarity, accuracy, and scope of the instrument. The panel consisted of family and consumer sciences professors, non family and consumer sciences faculty members, researchers, and a career and technical director. Suggested changes were to reword Questions 1-9 by removing the word I from the statements to lessen the personal nature of the questions. Also, the panel suggested that the demographic section be moved to the end of the survey. The committee indicated that the directions were clear and easy to read. Suggested changes were made. The final version of the instrument consisted of 23 questions and is available in Appendix C.

Cronbach's alpha was used to assess the internal consistency reliability of actual items on the instrument. Cronbach's alpha was calculated to establish reliability coefficients for the scales (a) technology tools, (b) technology assignments, (c) attitudes, (d) subjective norm, (e) perceived behavioral control, and (f) technology confidence. Cronbach's alpha ranges from 0 to 1, where 0 indicates no reliability and 1 indicates perfect reliability.

Data Collection

Each member of the population (N = 470) was asked to take part in a research study to investigate the extent to which family and consumer sciences teachers integrate technology into student assignments. Each member of the population received an e-mail containing an information letter (Appendix D) about the study with a link to the survey (Appendix C). Data were collected via SurveyMonkey®, with the settings for the instrument set so that IP addresses were not captured or stored on the database. Follow up e-mails were sent to the entire population because submissions were anonymous. Participants received two follow up e-mails spaced two weeks apart. The survey was closed after 1 month. A total of 126 completed or substantially completed surveys were retained for analysis, yielding a 26.8% return rate.

Data Analysis

The quantitative data gathered through the surveys were compiled and analyzed utilizing the Statistical Package for Social Sciences (SPSS). Descriptive statistics were used to analyze, organize, summarize, and describe the collected data.

Research Question 1, "To what extent are family and consumer sciences teachers requiring students to utilize technology to complete assignments?" Data collected were analyzed using descriptive statistics to calculate means and percentages.

Research Question 2, "To what extent does attitude, subjective norm, and perceived behavioral control predict Family and Consumer Sciences teachers' integration of technology into student assignments?" Data collected were analyzed using regression. Prior to the regression, scale scores were computed using the COMPUTE command for the independent variables (a) attitude, (b) subjective norm, (c) perceived behavioral control, and the dependent variables (a) technology tools and (b) technology used to complete assignments.

Research Question 3, “Is there a significant difference in the requirement of technology use in student projects among demographic groups; (a) age, (b) years of teaching family and consumer sciences, (c) highest degree, (d) location of campus, and (e) teaching philosophy?” Data collected to answer were analyzed using Analysis of Variance (ANOVA) tests.

Research Question 4, “To what extent does teacher confidence impact student assignments that require technology use?” Data collected were analyzed using a Pearson product moment correlation to determine to what extent teacher confidence impacts student assignments that require technology use.

Research Question 5, “In what format do family and consumer sciences teachers desire to receive professional development?” Data collected were analyzed using descriptive statistics to describe the current status of technology training received by family and consumer sciences educators.

IV. Statistical Analysis and Results

Introduction and Restatement of the Problem

This study was designed to provide information regarding the extent to which Alabama family and consumer sciences teachers require students to use various technologies to complete assignments and Alabama family and consumer sciences teachers preferred method of obtaining professional development in this regard. Reviewed literature in Chapter II revealed the importance for family and consumer sciences educators to include technology in student assignments to enhance student learning. This chapter presents the analysis of the data collected from Alabama family and consumer sciences educators utilizing the researcher-developed Family and Consumer Sciences Technology Integration instrument. The sample will be described in the first section. Results related to specific research questions will be presented in the second section.

Descriptive Data Analysis and Results

Descriptive statistics, including frequencies and percentages, were conducted in SPSS to organize, summarize, and describe the data and to provide an indication of the relationships between variables. One hundred twenty-six (126) returned surveys were used to compile data for this study. The Family and Consumer Sciences Technology Integration instrument was designed to collect demographic characteristics of the respondents.

Demographic data collected are summarized in Table 1 by (a) gender, (b) years of family and consumer sciences teaching experience, (c) highest degree level, (d) grade level taught, (e) location of campus, (f) awareness of ISTE standards, and (g) perceived teaching philosophy. Of the respondents, all but one respondent was female (99.1%). The largest percentages of respondents have been teaching family and consumer sciences for 6 to 10 years (20.9%). The majority of respondents hold a master's degree (53.0%). The largest percent of the respondents taught at a rural school (44.3%). The majority of respondents reported being unfamiliar with ISTE standards (83.3%). Most respondents classify their teaching philosophy as constructivist (80.7%).

Table 1

Demographic Data of Respondents

Categories	*n*	%
Gender (*n* = 115)		
Female	114	99.1
Male	1	0.9
Years Teaching Family and Consumer Sciences (*n* = 115)		
0 to 1	5	4.3
2 to 5	19	16.5
6 to 10	24	20.9
11 to 15	15	13.0
16 to 20	22	19.1
21 to 25	12	10.4
26 or more	18	15.7
Highest Degree (*n* = 115)		
Bachelor	50	43.5
Masters	61	53.0
Education Specialist	3	2.6
Doctorate	1	0.9

(Table continues)

(Table 1 continued)

Demographic Data of Respondents

Categories	*n*	%
Grades Taught (*n* = 115)		
6-8	17	14.8
9-12	70	60.9
7-12	28	24.3
Campus Location (*n* = 115)		
Rural	51	44.3
Suburban	39	33.9
Inner-city	15	13.0
Not Sure	10	8.7
Familiarity with ISTE (*n* = 114)		
No	95	83.3
Yes	19	16.7
Teaching Philosophy (*n* = 114)		
Constructivist	92	80.7
Combination	12	10.5
Behaviorist	10	8.8

Internal consistency reliability of six components was determined using coefficient alphas. The internal consistency coefficient for Technology Tools was α = .849 (*n* = 13 items). The internal consistency coefficient for Technology Assignments was α = .794 (*n* = 10 items). The internal consistency coefficient for Attitudes was α = .886 (*n* = 4 items). The internal consistency coefficient for Subject Norm was α = .763 (*n* = 3 items). The internal consistency coefficient for Technology Confidence was α = .900 (*n* = 9 items). The internal consistency coefficient for Perceived Behavioral Control (PBC) was α = .553 (*n* = 3 items). Table 2 presents this information. The six components analyzed in this section were used as subscale scores and used as variables in the data analyses. The reliability coefficients for each scale yielded a moderately high internal consistency with the exception of perceived behavioral control, which was somewhat lower.

Table 2

Internal Consistency Reliability

Variable	*Number of Items*	*M*	*SD*	α
Tech Confidence	9	2.38	.98	.900
Attitudes	4	4.25	.64	.886
Tech Tools	13	2.80	.76	.849
Tech Assignments	10	1.80	.46	.794
Subjective Norm	3	3.64	.72	.763
PBC	3	3.22	.77	.553

Research Questions

Research Question 1. Research Question 1 was "To what extent are family and consumer sciences teachers requiring students to utilize technology to complete assignments?"

Items 10 and 11 on the Family and Consumer Sciences Technology Integration instrument addressed the extent to which family and consumer sciences teachers require students to utilize technology tools to complete assignments and what type of assignments are being completed with technology. Technology tools most often used were computers, Microsoft Office, printer, and LCD projector. The technology tools utilized the least were iPod touch, iPad, Photostory, and the Mp3 player. From visual analyze of the data from question 10 of the survey, approximately 40 to 46 % of respondents reported the following technology tools as not available: Smart Board (40%), document camera (43%), and Mp3 player (46%). Flip cameras and Photostory were reported not available by approximately 50% of the respondents. Slightly more than 60% of respondents reported the iPad and iPod touch as not available. The results are shown in Table 3.

Table 3

Technology Tools Required to Use to Complete Assignments

Item	*n*	*M*	*SD*
Computer	125	4.34	.976
Microsoft Office	125	4.22	1.39
Printer	123	4.05	1.10
LCD Projector	125	4.01	1.57
Camera	123	3.20	1.19
Smart Board	124	2.71	1.86
Scanner	123	2.67	1.10
Document Camera	122	2.26	1.46
Flip Camera	124	1.94	1.15
Mp3 Player	124	1.92	1.13
Photostory	121	1.77	.947
iPad	124	1.62	1.03
iPod Touch	123	1.59	.940

Assignments that require technology for completion most often required by family and consumer sciences teachers are assignments to conduct research, create and present multimedia presentations, complete simulations, and complete test. Assignments that require technology for completion least often required by family and consumer sciences teachers are assignments to contribute to Wikis, create a Wiki, contribute to blogs, and contribute to online discussion boards. Results are shown in Table 4.

Table 4

Assignments to Complete with Technology

Item	*n*	*M*	*SD*
Research	124	3.19	.833
Multi Media Presentation	125	2.74	.824
Simulations	123	2.13	.905
Test/Quiz	125	1.96	1.09
WebQuest	124	1.56	.858
Listen to Pod Cast	125	1.42	.754
Online Discussion	125	1.40	.741
Contribute to Blogs	124	1.30	.611
Contribute to Wikis	125	1.23	.598
Create a Wiki	124	1.15	.397

Research Question 2. Research Question 2 was "To what extent does attitude, subjective norm, and perceived behavioral control predict Family and Consumer Sciences teachers' integration of technology into student assignments?" Data gathered to answer Question 2 are presented in Table 5.

Table 5

Descriptive Statistics for Technology Tools

Variable	*n*	*M*	*SD*
Technology Tools	125	2.80	.758
Attitudes	125	4.26	.644
Subjective Norm	125	3.66	.709
PBC	125	3.22	.769

Backward multiple regression was conducted to determine which independent variables (attitude, subjective norm, and PBC) were predictors of teachers requiring students to use technology tools to complete projects. Regression results indicate an overall model of three predictors (attitude, subjective norm, and PBC) that significantly predict teachers requiring students to use technology tools to complete assignments, $R^2 = .257$, $R^2_{adj} = .238$, $F\ (3,121) = 13.94$, $p < .001$. This model accounted for 25.7% of variance in family and consumer sciences teachers requiring students to use technology tools to complete assignments. A summary of the regression model is presented in Table 6.

Table 6

Regression Statistics for Prediction: DV Technology Tools Model Summary

Variables	R Square	β	Zero-Order Correlation	Semi-Partial Correlation
Full Model	.257			
Attitude		.011	.190	.011
Subjective Norm		.004	.182	.004
PBC		.501***	.507	.449
Restricted Model	.257			
PBC		.507	.507	.507

a. Predictors in the Model: (Constant), PBC, Subjective Norm, Attitudes
b. Predictors in the Model: (Constant), PBC, Attitudes
c. Predictors in the Model: (Constant), PBC

Research Question 3. Research Question 3 was “Is there a significant difference in the requirement of technology use in student projects among demographic groups: (a) age, (b) years of teaching family and consumer sciences, (c) highest degree, (d) location of campus, and (e) perceived teaching philosophy?” Data gathered to answer research question 3 were analyzed using Analysis of Variance (ANOVA) tests. The dependent variables examined were the technology tools family and consumer sciences teachers required students to use to complete assignments and technology assignments.

Technology tools. Participants responded to how often they required students to use technology to complete assignments on a six-point Likert scale. The scale ranged from one to six with six indicating daily, five indicating weekly, four indicating monthly, three indicating rarely, two indicating never, and one indicating not available. The technology tools listed were: computer, printer, scanner, LCD projector, digital camera, flip camera, Mp3 player, document camera, SMART board, iPad, iPod touch, Microsoft Office, and Photostory. Each participant had a possible total score between 1 and 78 for the 13 items listed as technology tools. The highest possible mean value was 39. The mean scores and standard deviations for differences in the requirement of technology tools in student assignments are shown in Table 7.

With an alpha level of .05, there were no statistically significant differences in the family and consumer sciences teachers requirement of technology tools used to complete student projects based on their highest degree held [$F(1, 114) = .497$, $p = .482$], location of campus [$F(2, 102) = 1.07$, $p = .35$], and perceived teaching philosophy [$F(2, 111) = 1.17$, $p = .31$]. No further tests were necessary.

A Pearson product-moment coefficient was computed to assess the relationship between family and consumer sciences teachers’ requirement of technology tools used to complete student projects and age and years of teaching experience. There was no correlation between technology tools and age, $r = .088$, $n = 112$, $p > .05$. There was no correlation between technology tools and years of teaching experience, $r = .010$, $n = 115$, $p > .05$.

Technology Assignments. Participants responded to how often during the school year they required students to complete technology assignments on a six-point Likert scale. The scale ranged from 1 to 5 (1 = never, 2 = rarely, 3 = monthly, 4 = weekly, 5 = daily). The technology assignments listed were (a) complete simulations, (2) create and present multimedia presentations, (3) conduct research, (4) contribute to online discussion boards, (5) contribute to blogs, (6) contribute to Wikis, (7) create a Wiki, (8) complete a WebQuest, (9) listen to podcasts, and (10) complete test/quiz. Each participant had a possible total score between 1 and 50 for the 10 items listed as technology assignments. The highest possible mean value was 25. The mean scores and standard deviations for differences in the requirement to complete technology assignments are shown in Table 7.

With an alpha level of .05, there were no statistically significant differences in family and consumer sciences teachers requiring students to complete technology assignments based on their highest degree [$F(1, 113) = 2.75$, $p = .10$], location of campus [$F(2, 102) = 2.75$, $p = .07$], and perceived teaching philosophy [$F(2, 111) = .73$, $p = .49$]. No further tests were necessary.

A Pearson product-moment coefficient was computed to assess the relationship between family and consumer sciences teachers' requiring students to complete technology assignments and age and years of teaching experience. There was no correlation between technology assignments and age, $r = .042$, $n = 112$, $p > .05$. There was no correlation between technology assignments and years of teaching experience, $r = .004$, $n = 115$, $p > .05$.

Table 7

Mean Scores, Standard Deviations, and F-Values for the Requirement of Technology Tools in Student Assignments and for the Requirement to Complete Technology Assignments Based on: Highest Degree, Location of Campus, and Teaching Philosophy

Item	*Requirement of Tech Tools* *M (SD)*	*F*	*Requirement to Complete Assignment* *Mean (SD)*	*F*
Highest Degree (*n* = 115)		.497		2.74
Bachelors	2.74 (.75)		1.72 (.41)	
Masters and Higher	2.84 (.77)		1.86 (.49)	
Location of Campus (*n* = 105)		1.07		2.75
Rural	2.73 (.79)		1.84 (.52)	
Inner-City	3.06 (.87)		1.98 (.59)	
Suburban	2.78 (.75)		1.68 (.31)	
Teaching Philosophy (*n* = 114)		1.17		.728
Behaviorist	2.44 (.87)		1.67 (.33)	
Constructivist	2.83 (.78)		1.82 (.48)	
Combination	2.80 (.51)		1.71 (.33)	

Research Question 4. Research Question 4 was "To what extent does teacher confidence impact student assignments that require technology use?"

A Pearson product-moment correlation coefficient was computed to assess the relationship between teacher confidence level and technology tools required by students to complete assignments and between teacher confidence level and technology assignments. There was a positive correlation between teacher confidence level and technology tools, $r = .550$, $n = 123$, $p < .001$. There was a positive correlation between teacher confidence level and technology assignments, $r = .467$, $n = 123$, $p < .001$. Overall, there was a moderate positive correlation between teacher confidence level and the integration of technology into student assignments.

Research Question 5. Research Question 5 was “In what format do family and consumer sciences teachers desire to receive professional development?”

Descriptive statistics were used to describe the current status of technology training received by family and consumer sciences educators. Respondents had the option to select all choices that applied to them. The results are listed in Table 8.

Table 8

Technology Training Received

Item	*n*	%
No Training	2	1.6
Basic Computer Skills	87	69.0
Internet Applications	71	56.3
Integration for Delivery of Instruction	63	50.0
Integration for Student Learning	52	41.3

Teachers were asked their interest in professional development related to integrating technology into student projects. Ninety-one percent ($n = 121$) were interested in professional development for integrating technology into student assignments. Nine percent were not interested in professional development.

Participants were asked to rate their interest in methods of obtaining professional development on a five-point Likert scale. The scale ranged from one to five with five indicating strong interest, four indicating interest, three indicating neutral, two indicating slight interest, and one indicating not interest. The methods listed for obtaining professional development were (a) district professional development meeting, (b) on-campus professional development day, (c) online professional development course, (d) American Association of Family and Consumer Sciences National Conference (AAFCS), (e) Alabama Family and Consumer Sciences State Conference (ALAFCS), (f) ACTE Summer Conference, and (g) self-directed learning. The results are shown in Table 9.

Table 9

Methods of Obtaining Professional Development

Item	*n*	*M*	*SD*
On Campus Professional Development Day	113	4.11	.94
ACTE Summer Conference	113	4.00	1.20
District Professional Development Day	112	3.74	1.15
On line Professional Development Course	112	3.60	1.30
ALAFCS State Conference	112	3.59	1.31
Self-directed Learning	112	3.48	1.22
AAFCS National Conference	109	2.79	1.44

V. Summary, Conclusions, and Recommendations

This chapter provides a summary of the study, interpretation of the data analysis, discussion, and conclusions. Recommendations for future research related to the integration of technology into student assignments to advance learning are included.

Introduction

Technology integration into the curriculum is important to the future success of students. The twenty-first century digital society demands that students be equipped with the know how to effectively utilize technology to research, locate, prepare, and share information, to design and complete projects, as well as to develop problem-solving and critical-thinking skills to know which technology is best suited for the task at hand. The purpose of this study was to investigate the extent to which Alabama family and consumer sciences teachers are requiring students to utilize technology to complete assignments and the factors that influence teachers' decisions to assign projects that require students to use technology. Also, the study conducted in the fall semester of 2011, sought to assess the degree of confidence Alabama family and consumer sciences teachers have in their ability to design projects that require students to use various technologies. A researcher developed instrument was used to collect data.

Theoretical Perspective

The Theory of Planned Behavior developed by Ajzen (1988) was used to design and guide this study. Variables of the Theory of Planned Behavior relevant to this study included attitude, subjective norm, and perceived behavioral control.

Summary of Findings

The population of 470 Alabama family and consumer sciences teachers was surveyed. Useable questionnaires were returned by 126 respondents. Data were analyzed for demographic information, attitude scores, subjective norm scores, and perceived behavior control scores towards the integration of technology into student assignments. Family and consumer sciences teachers' confidence scores towards the integration of technology into student assignments were analyzed also.

Demographic Information

The majority of Alabama family and consumer sciences teachers who responded to the survey were female (99.1%). The age of the respondents was between 22 and 62 years of age with a mean age of 44.78 years. The majority of the respondents (56.5%) reported the highest degree held as master's level or higher, 53.0% having a master's degree, 2.6% hold an education specialist degree, and 0.9% hold a doctorate degree.

Respondents were categorized by years of teaching family and consumer sciences with seven different categories. Five of the seven categories ranged between 11-20% of the respondents. The 6-10 years category accounted for 20.9%, 16-20 years accounted for 19.1%, 2 -5 years accounted for 16.5%, 26 or more years accounted for 15.7%, and 11-15 years accounted for 13.0% of the respondents.

Slightly more than half of the respondents (60.9%) taught grades 9-12, and 24.3% taught grades 7-12. Middle school teachers teaching grades 6-8 accounted for 14.8%. More than forty percent (44.3%) of the respondents taught in rural areas, 33.9% taught in suburban areas, and 13.0% taught in inner-city schools.

The majority of respondents (80.7%) reported a constructivist teaching philosophy. Twelve family and consumer sciences respondents (10.5%) reported a combination (constructivist and behaviorist) teaching philosophy and ten respondents (8.8%) reported a behaviorist teaching philosophy. Most family and consumer sciences teachers (83.3%) reported not being familiar with ISTE standards.

In summary, respondents were mature, experienced family and consumer sciences teachers with the mean age of 45 years. More than half having taught more than ten years. The educational levels of respondents indicate a high level of education ambition. Demographic results are similar to those reported by Harrison, Redmann, and Kotrlik (2000) of Louisiana family and consumer sciences teachers. This indicates, as a group, Alabama family and consumer sciences teachers have been around since the “boom” of technology, whether in the classroom or other professions.

The majority of respondents taught in high schools (grades 9-12) and 44.3% of the respondents taught in schools located in rural areas. A constructivist teaching philosophy was the dominate philosophy reported by respondents. Although the respondents have many years teaching, 83.3% of them indicated they were unfamiliar with ISTE standards.

Research Questions

Family and consumer sciences teachers were asked to indicate to how often they require students to use specific technology tools to complete assignments. Four (computer, Microsoft Office, printer, and LCD projector) of the 13 listed technology tools yielded a mean score ≥ 4.01, and 5 (iPod Touch, iPad, Photostory, Mp3 player, and flip camera) technology tools yielded a mean score between 1.59 and 1.94, respectively. The scale response choices ranged from 1 = not available to 6 = daily. This indicates that basic computer skills in word processing and PowerPoint presentations are the most frequently used ways of integrating technology into student assignments. Printers are potentially used to print copies of word processing assignments and the LCD projector is potentially used to present completed assignments to the teacher and the class. The lack of use of more current technology tools (iPod Touch, iPad, and flip cameras) is due to items not being available.

Family and consumer sciences teachers were asked to report how often they require students to complete specific technology assignments. One of the 10 listed technology assignments yielded a mean score above 3.0.

Conducting research using technology yielded a mean score of 3.19. Seven (contributing to online discussion boards, contributing to blogs, contributing to Wikis, creating a Wiki, completing a WebQuest, listening to podcasts, and completing a test/quiz) of the 10 listed technology assignments yielded a mean score below 2.0. The scale response choices ranged from 1 = never to 5 = daily. The results indicated that research assignments were the foremost way family and consumer sciences teachers integrated technology into student learning. If students have access to a computer that allows them to conduct research, the computer must have Internet access; therefore, students would be able to complete other technology assignments listed above if assigned by the teacher.

Research Question 2 was designed to determine if a relationship existed between attitudes, subjective norm, and perceived behavioral control in the integration of technology into student assignments by family and consumer sciences teachers. The best predictor of family and consumer sciences teachers' intentions to require technology tools to be utilized to complete assignments was perceived behavioral control ($\beta = .507$, $p < .001$). Perceived behavioral control refers to the respondent's perception of their ability to utilize technology to advance student learning. The teachers' confidence level in their ability to integrate technology into student learning indicates that if they felt more confident in their ability, they would integrate more modern technology into assignments.

Research Question 3 examined the difference in the requirement of technology use in student projects among demographic groups based on (a) age, (b) years of teaching family and consumer sciences, (c) highest degree, (d) location of campus, and (e) perceived teaching philosophy. Analysis of Variance (ANOVA) tests were conducted. There were no statistically significant differences in the family and consumer sciences teachers requirement of technology tools used to complete student projects based on their highest degree [$F(1, 114) = .497$, $p = .482$], location of campus [$F(2, 102) = 1.07$, $p = .35$], and teaching philosophy [$F(2, 111) = 1.17$, $p = .31$]. There were no statistically significant differences in teachers requiring students to complete technology assignments based on their highest degree [$F(1, 113) = 2.75$, $p = .10$], location of campus [$F(2, 102) = 2.75$, $p = .07$], and teaching philosophy [$F(2, 111) = .73$, $p = .49$]. There was no correlation between technology tools and technology assignments based on age and years of teaching.

Research Question 4 pertained to the relationship between a teacher's confidence level and the impact that confidence level had on making student assignments that require technology use. A Pearson product-moment correlation design was utilized to determine if there was a statistically significant relationship between confidence level and technology tools and confidence level and technology assignments. The Pearson r correlation for technology tools yielded statistically significant results, $r = .550$, $p < .001$. The Pearson r correlation for technology assignments yielded statistically significant results, $r = .467$, $p < .001$, indicating a strong statistically significant correlation. Family and consumer sciences teachers were asked to indicate their level of confidence in designing student projects that require students to use technology. Nine technology items listed were simulations, multimedia presentations, Wikis, WebQuest, flip camera, Mp3 player, iPad, iPod Touch, and Photostory. Six of the nine items listed yielded a mean score between 2.24 and 2.51. One item, multimedia presentations yielded a mean score of 3.54). The scale contained response choices ranging from 1 = not at all confident to 5 = highly confident. The results indicated that teachers do not feel confident in their ability to design projects that require more modern technology. Due to the lack of confidence in their ability to design technology projects, conducting research, constructing PowerPoint presentations, and word processing appear to be technology projects that family and consumer sciences teachers feel more confident integrating into the classroom and student learning.

Research Question 5 sought to identify the format of technology professional development desired by family and consumer sciences teachers. Less than 2% of participants reported having had no training in technology and only 41.3% received training in integrating technology for student learning, a statistic that supports the finding that family and consumer sciences teachers' confidence levels in their ability to design assignments that integrate technology is less than optimal. This finding supports the need to provide continuing professional development with practicing teachers and also to investigate the family and consumer sciences curriculum to identify ways to improve this percentage. Findings showed that participants preferred professional development held on campus during professional development days at the school and at the district level. Future research should include the design and testing of educational interventions to upgrade the skill level of family and consumer sciences teachers for integrating technology for student learning. Research conducted by Anderson and Borthwick (2002) shows that "participants whose technology instruction was integrated in their methods course reported more frequent use of technology for both teacher productivity and student projects during both on-campus courses and their first year of actual classroom teaching" (p. 5).

Conclusions

The following conclusions were determined based on the findings of this study.

1. Family and consumer sciences teachers in Alabama currently require only basic technology tools (computers, Microsoft Office, printers, and LCD projectors) to be used monthly in the classroom. Current technology tools (iPod Touch, iPad, Photostory, Mp3 players, and flip cameras) were reported as rarely required for use in the classroom.
2. Family and consumer sciences teachers in Alabama require students to conduct research using the computer more often than any other type of computer assignment. Discussion boards, blogs,

Wikis, WebQuest, podcasts, and online tests were reported as rare assignments required by family and consumer sciences teachers.

3. Perceived behavioral control was a significant factor in the Alabama family and consumer sciences teachers' intentions to integrate technology into student assignments. If teachers' confidence levels in their ability to use current technology were higher, the potential to integrate more technology into student assignments should be higher.
4. Alabama family and consumer sciences teachers prefer professional development to be provided through an on campus professional development day. Also, ACTE Summer Conference is a preferred method for professional development.

Recommendations

Based on the conclusions, the following recommendations are made:

1. Transform future professional development from computer training to understanding the link between technology, pedagogy, and content to support student-centered learning.
    a. Teacher education programs could hire a technology specialist for each teacher education discipline offered on campus to assist preservice teachers with content assignment technology integration.
    b. Intense family and consumer sciences content technology integration workshops could be provided at their summer

conference with extensive time devoted to each family and consumer sciences course of study pathway.

   c. Career and technical district directors could follow up intensive trainings with onsite professional development opportunities targeting family and consumer sciences content technology integration.

2. Allow time for educators to learn, experiment with, and integrate emerging technologies in a supportive environment.
3. Replicate this study with other career and technical education disciplines.

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APPENDICES

APPENDIX A

PERMISSION TO USE TpB FIGURE

RE: Permission to include diagram in dissertation

Icek Aizen [aizen@psych.umass.edu]
Sent: Tuesday, February 14, 2012 8:40 AM
To: Mary Bell

Dear Ms. Bell,

The theory of planned behavior is in the public domain. No permission is needed to use the theory in research, to construct a TPB questionnaire, or to include an ORIGINAL drawing of the model in a thesis, dissertation, presentation, poster, article, or book. However, if you would like to reproduce a published drawing of the model, you need to get permission from the publisher who holds the copyright. You may use the drawing on my website (http://www.people.umass.edu/aizen/tpb.diag.html) for non-commercial purposes so long as you retain the copyright notice.

Best regards,

Icek Ajzen, Professor and Head
Division of Social Psychology
University of Massachusetts
Amherst, MA 01003
http://www.people.umass.edu/aizen

From: Mary Bell [mailto:mdb0010@tigermail.auburn.edu]
Sent: Tuesday, February 14, 2012 12:20 AM
To: aizen@psych.umass.edu
Subject: Permission to include diagram in dissertation
Importance: High

Dr. Aizen,

My name is Donna Bell and I am a doctoral student at Auburn University. I am in the writing stage of my dissertation and the Theory of Planned Behavior works well with my topic - Integration of technology by family and consumer sciences teachers into student assignments.

I would like to include the diagram representation of the Theory of Planned Behavior in my dissertation. I am writing to ask permission to include the diagram in my dissertation. Please let me know if permission is granted or denied at your earliest convenience.

Sincerely,

Donna Bell

APPENDIX B

INSTITUTIONAL REVIEW BOARD APPROVAL

AUBURN
UNIVERSITY

Office of Research Compliance
307 Samford Hall
Auburn University, AL 36849

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June 14, 2012

MEMORANDUM TO:	Ms. Mary (Donna) Bell Department of Curriculum and Teaching
PROTOCOL TITLE:	"Integration of Technology into Student Assignments by Family and Consumer Sciences Teachers"
IRB FILE NO.:	11-239 EX 1107
APPROVAL DATE:	July 29, 2011
EXPIRATION DATE:	July 28, 2012

The referenced protocol was approved "Exempt" by the IRB under federal regulation 45 CFR 46.101 (b) (2):

> "Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless:
> (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and
> (ii) any disclosure of the human subjects' response outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation."

You should retain this letter in your files, along with a copy of the revised protocol and other pertinent information concerning your study. If you anticipate a change in any of the procedures authorized in this protocol, you must request and receive IRB approval prior to implementation of any revision. Please reference the above IRB file number in any correspondence regarding this project.

If you will be unable to file a Final Report on your project before July 28, 2012, you must submit a request for an extension of approval to the IRB in early July 2012. If your IRB authorization expires and/or you have not received written notice that a request for an extension has been approved prior to July 28, 2012 you must suspend the project immediately and contact the Office of Research Compliance.

<u>A Final Report will be required to close your IRB project file</u>. Please keep a copy of the approved information letter to send in with the report.

If you have any questions concerning this Board action, please contact the Office of Research Compliance.

Sincerely,

Kathy Jo Ellison, RN, DSN, CIP
Chair of the Institutional Review Board
for the Use of Human Subjects in Research

cc: Dr. Nancy Barry
Dr. Leanne Skinner

APPENDIX C

SURVEY INSTRUMENT

FCS Technology Integration

FCS Technology Integration

You are invited to participate in a research study to determine the intergration of technology into student assignments by family and consumer sciences teachers. Participation is voluntary. By clicking on the link to enter the survey, you have given your consent to participate. The survey will take approximately 15 minutes to complete. When submitted, the data is anonymous and cannot be withdrawn. If at any time during the survey, you decide to not participate; simply close your browser window and no data will be captured. Your participation is completely voluntary.

Thank you for taking the time to complete the survey.

FCS Technology Integration

Technology

1. Projects that require students to utilize technology promotes student-centered learning and self-discovery.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

2. Projects that require students to utilize technology can enhance students' creativity and imagination.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

3. Projects that require students to utilize technology can engage students in collaborative work.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

4. I am confident in my ability to assign projects that require students to utilize technology.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

5. Projects that require students to utilize technology allows them to experience real world problem solving more effectively.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

6. Colleagues expect me to assign projects that require students to utilize technology.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

7. Parents expect me to assign projects that require students to utilize technology.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

8. It is difficult for me to assign projects that require students to utilize technology.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

9. Administration expects me to assign projects that require students to utilize technology to advance their learning.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

FCS Technology Integration

10. Indicate how often during the 2010-2011 school year you required students to use the following technology tools to complete assignments?

	Not available	Never	Rarely	Monthly	Weekly	Daily
Computer	○	○	○	○	○	○
Printer	○	○	○	○	○	○
Scanner	○	○	○	○	○	○
LCD Projector	○	○	○	○	○	○
Digital Camera	○	○	○	○	○	○
Flip Camera	○	○	○	○	○	○
Mp3 Player	○	○	○	○	○	○
Document Camera	○	○	○	○	○	○
SMART Board/Interactive White Board	○	○	○	○	○	○
iPad	○	○	○	○	○	○
iPod Touch	○	○	○	○	○	○
MicroSoft Office Software	○	○	○	○	○	○
Photostory	○	○	○	○	○	○

Other (please specify)

11. Indicate how often during the 2010-2011 school year did you require students to use technology to:

	Never	Rarely	Monthly	Weekly	Daily
Complete Simulations	○	○	○	○	○
Create and present multimedia presentations	○	○	○	○	○
Conduct research	○	○	○	○	○
Contribute to on-line discussion boards	○	○	○	○	○
Contribute to blogs	○	○	○	○	○
Contribute to Wikis	○	○	○	○	○
Create a Wiki	○	○	○	○	○
Complete a WebQuest	○	○	○	○	○
Listen to podcasts	○	○	○	○	○
Complete a test/quiz	○	○	○	○	○

Other (please specify)

FCS Technology Integration

Confidence Level

Indicate your level of confidence in designing projects that require students to use technology.

Highly Confident - In-depth knowledge and skill to fully integrate technology into assignments.

Confident - Reasonable knowledge and skill to integrate technology into assignments.

Slightly Confident - Limited knowledge and skill in ways to integrate technology into assignments.

Not at all Confident - Do not have the knowledge or skill to integrate this technology into assignments.

12. Student projects that include:

	Not At All Confident	Slightly Confident	No Opinion	Confident	Highly Confident
Simulations	○	○	○	○	○
Multimedia Presentations	○	○	○	○	○
Wikis	○	○	○	○	○
WebQuest	○	○	○	○	○
Flip Camera	○	○	○	○	○
Mp3 Player	○	○	○	○	○
iPad	○	○	○	○	○
iPod Touch	○	○	○	○	○
Photostory	○	○	○	○	○

FCS Technology Integration

Professional Development

13. What type of educational technology training have you received?

- [ ] No training
- [ ] Basic computer skills
- [ ] Internet applications
- [ ] Technology integration for delivery of instruction
- [ ] Technology integration for student learning
- [ ] Other (please specify)

14. Are you interested in professional development related to integrating technology into student projects.

- ○ Yes
- ○ No

15. If yes,rate your interest in the following methods for obtaining professinal development.

	No Interest	Slightly Interested	Neutral	Interested	Strong Interest
District professional development meetings	○	○	○	○	○
On-campus professional development day	○	○	○	○	○
On-line professional development courses	○	○	○	○	○
AAFCS national conference	○	○	○	○	○
ALAFCS state conference	○	○	○	○	○
ACTE summer conference	○	○	○	○	○
Self-directed learning	○	○	○	○	○

FCS Technology Integration

Demographics

16. What is your gender?

- ◯ Male
- ◯ Female

17. How many years experience do you have teaching Family and Consumer Sciences?

- ◯ 0-1
- ◯ 2-5
- ◯ 6-10
- ◯ 11-15
- ◯ 16-20
- ◯ 21-25
- ◯ 26 or more

18. What is your highest degree completed?

- ◯ Bachelors degree
- ◯ Masters degree
- ◯ Education Specialist degree
- ◯ Doctoral Degree

19. What is your age?

20. What grade levels do you teach?

- ◯ 6-8
- ◯ 9-12
- ◯ 7-12

Other (please specify)

FCS Technology Integration

21. What is the location classification of your campuse as designated by the State Department of Education?

- ◯ Rural
- ◯ Inner-city
- ◯ Suburban
- ◯ Not sure

22. Are you familiar with the International Society of Technology Education standards?

- ◯ Yes
- ◯ No

23. How would you classify your teaching philosophy?

- ◯ Behaviorist (teacher centered learning environment - students are passive participants)
- ◯ Constructivist (student-centered learning environment - students actively construct knowledge)
- ◯ Other (please specify)

FCS Technology Integration

Thank You

Thank you for taking the time to complete this survey. To submit the survey, please click below. If you wish to withdraw from the survey, simply close your browser and no informatin will be collected.

APPENDIX D

INFORMATION LETTER

Integration of Technology into Student Assignments by Family and Consumer Sciences Teachers

Dear Alabama Family and Consumer Sciences Educators:

You are invited to participate in a research study designed to investigate the integration of technology into student assignments, factors that influence these decisions, and the degree of confidence FCS teachers have in their ability to design projects that require students to use various technologies to complete. . The study is being conducted by Donna Bell, a doctoral candidate, under the supervision of Dr. Leane Skinner, an Associate Professor in the Career and Technical Education Department at Auburn University. You were selected as a participant because you are listed as a Family and Consumer Sciences teacher in the 2010-2011 Alabama Department of Family and Consumer Sciences Education Directory and are 19 years old or older.

Your participation is completely voluntary. If you decide to participate in this research study, you will be asked to complete and submit an electronic survey. You total time commitment will be approximately 15 minutes.

There are no risks associated with participating in this study. Although there are no guarantees of personal benefits from participating in the study, the potential of utilizing revealed information to improve technology professional development and or teacher education curriculum may occur.

Any data obtained in connection with this study will remain anonymous. In order to protect your privacy, IP addresses and e-mail addresses will not be saved when the electronic survey is submitted. Information collected through your participation may be used as partial fulfillment of the requirements for the Doctor of Philosophy Degree and future publications and presentations.

If you change your mind about participating, you can withdraw at any time by closing your browser window. Once you have submitted anonymous data, it cannot be withdrawn since it will be unidentifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Auburn University, the Department of Curriculum and Teaching, or your school system.

If you have any questions about this study, please contact Donna Bell at (205) 706-3911 (MDB0010@auburn.edu) or Dr. Leane Skinner at (334) 844-3800 (skinnal@auburn.edu).

If you have questions about your rights as a research participant, you may contact the Auburn University Office of Human Subjects Research or the Institutional Review board by phone (334) 844-5966 or e-mail at hsubject@auburn.edu or IRBChair@auburn.edu .

HAVING READ THE INFORMATION ABOVE, YOU MUST DECIDE IF YOU WANT TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDE TO PARTICIPATE, PLEASE CLICK ON THE LINK BELOW. YOU MAY PRINT A COPY OF THIS LETTER TO KEEP.

Donna Bell

Donna Bell Date
Doctoral Candidate
Principal Investigator

The Auburn University Institutional Review Board has approved this document for use from 7/28/11 to 7/27/12
Protocol # 11-239 EX 1107

The Auburn University Institutional Review Board has approved this document for use from July 28, 2011 to July 27, 2012. Protocol # 11-239EX1107

Link To Survey