FAMILY CONSUMER SCIENCES TEACHERS' USE OF TECHNOLOGY TO TEACH HIGHER ORDER THINKING SKILLS

A Dissertation

Presented to the
Faculty of Argosy University/Schaumburg
College of Education and Human Development

In Partial Fulfillment of
The Requirements for the Degree of

Doctor of Education

by

Beth Erica Hirose

Argosy University/Schaumburg

July, 2009

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Abstract

Family and consumer sciences (FACS) high school teachers were surveyed on their use of technology to teach higher order thinking skills (HOTS). This study determined if teachers had enough support and training to use technology. Lesson plans were accumulated that required both technology and higher order thinking skills. These lessons were then categorized by subject and level of higher order thinking skill(s). Quantitative and qualitative data were gathered via SurveyMonkey®. The null hypothesis, that FACS teachers do not have enough support and training in the areas of finances, training, time, computers, and confidence in their abilities, failed to be rejected, as 80% of teachers were sufficiently supported and trained. These findings were compared with teachers' use of technology to teach HOTS, according to the International Society for Technology in Education's Standards. Ninety percent of teachers agreed or strongly agreed that they were using technology to teach HOTS and were sufficiently supported and trained in the use of technology. Collected FACS lesson plans that incorporated HOTS and technology were posted online at http://sites.google.com/site/familyconsumerscienceslessons/. It is recommended that more data be collected as to the specific technology training teachers do want. Teachers should then be grouped in training sessions according to their skill level. By observing and interviewing FACS teachers, more detailed data can be gathered as to how technology is used in the classroom. (Contains 20 tables and 6 appendices)

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Acknowledgement Page

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Dedication Page

I dedicate this work to my grandma, Ann Muni, Ph.D. who inspired me in the first place. She was a remarkable educator who cared a lot about her students.

Family Consumer Sciences Teachers' Use of Technology to Teach Higher Order Thinking Skills

CHAPTER 1: INTRODUCTION

Purpose

The purpose of this mixed methods study was to determine how technology is being used in family consumer sciences high school classes based on the International Society for Technology in Education's (ISTE) National Educational Technology Standards (NETS) and performance indicators for teachers. Of specific interest were Bloom's higher order thinking, or cognitive skills, and if and how they are being taught using technology. Lesson plans were collected to determine this. The ability to apply technology to teach higher order thinking skills is expected of preservice family consumer sciences teachers (those training to be teachers) upon entering the field (Croxall, K. C. PhD., 2002). These skills are also expected to be learned by all high school students (International Society for Technology in Education, 2008b). The curriculum in family consumer sciences courses is created to teach authentic real-life lessons which are immediately applicable outside of the classroom.

What particular technology is used in the classroom and are teachers receiving the needed support to use this technology? Those who have already been teaching are expected to utilize whatever latest technology their school district obtains, often with little training (Kingsley, 2007). This study discovered if family consumer sciences high school teachers felt sufficiently supported by their school in the use of technology and if they felt they received enough technology

training to instruct students. For the purpose of this study, the definition of educational technology, as explained in the Definition of Terms section, was used with regard to the word technology.

Research Questions

1. Do family consumer sciences high school teachers feel sufficiently supported by their schools to use technology?
2. Do family consumer sciences high school teachers feel they receive enough training in technology to instruct their students through the use of technology?
3. How are family consumer sciences high school teachers using technology to teach higher order thinking skills?

Hypothesis

Family consumer sciences high school teachers do not feel sufficiently supported by their schools to use technology and they do not feel they receive enough training in technology to instruct their students through the use of technology.

Null Hypothesis

Family consumer sciences high school teachers do feel sufficiently supported by their schools to use technology and they do feel they receive enough training in technology to instruct their students through the use of technology.

Background

Does technology increase failing students' motivation? T. C. Williams High School in Alexandria, Virginia is just one example of a school spending substantial amounts of money on the latest gadgets in order to excite and motivate their students. Welsh (2008) found that not only were teachers encumbered by the number of new devices, the students found that the new technology stifled learning. A student commented that he/she preferred one of his/her teachers who simply wrote on the board and communicated with the students rather than fumble with electronic notebooks. While there are schools such as T. C. Williams that can afford to give each student their own laptop with wireless capabilities, other schools lack the funds to support technological advancements (Welsh, 2008). Will students from schools who do not have the latest technology lag behind their peers as far as achievement because of non-technological teaching techniques? Does technology automatically ensure a better education? Are teachers using technology to teach higher order thinking skills? Are teachers incorporating new hardware and software into their family consumer sciences curriculums? Not all educators agree that the more technology, the better the curriculum (Welsh, 2008).

One possible setback with using the latest technology is that teachers may not be receiving enough training to use the technology appropriately (Levin & Wadmany, 2008). This may cause teachers to resist using technology to its fullest extent. Some teachers feel that "all the computer activities just take us away from students" (Welsh, 2008). Technology encourages students to look for

the quick answer rather than think through the process themselves (Welsh, 2008). For example, students asked to compute a very simple math problem take out their calculators instead of taking a moment to reason. Bloom's cognitive taxonomy is used by teachers to educate their students on varying levels of difficulty. The top three parts of this hierarchy include students analyzing, synthesizing, and evaluating ideas and data. These levels are what are recognized as higher order thinking skills (Johnson & Lamb, 2007). In the example of the calculator, it would seem that technology is taking away the need for students to think. Are teachers creating situations where technology and higher order thinking skills coincide?

The International Society for Technology in Education (ISTE) created national education standards in technology which teachers in each discipline are expected to grasp in order for students to be ready to meet today's challenges (International Society for Technology in Education, 2008a). These standards include abilities such as teaching higher order thinking skills, using a variety of resources, and suitably assessing students. Although it was revealed that many teacher educators (university professors preparing soon-to-be teachers) were not aware of these standards, they were actually already teaching these same methods (Croxall, K. C. PhD., 2002). It is the mission of ISTE to "provide…leadership and service to improve teaching, learning, and school leadership by advancing the effective use of technology in PK–12 and teacher education" (International Society for Technology in Education, 2008a). This

present study is based on K. Croxall, PhD's study, which used the 2000 version of the standards.

There are many positive educational outcomes derived from using technology which, as a result, are more effectively accomplished then they would be otherwise. One instance is the way that technology is utilized to monitor students' Internet-usage in computer labs. Whoever is teaching in the front of the room, or monitoring users from an office, now has the ability to see what every student has on his/her screen. The teacher has the ability to freeze or close a student out from whatever screen or program they are viewing. This monitoring helps students make wiser choices as far as which web sites are school-appropriate. The school, therefore, does not have to install an Internet-blocking system (Weber, 2008). Another benefit of technology is using it to discuss sensitive topics online rather than students confronting each other. When students cannot see with whom they are talking online, they are not as nervous about giving their opinions and sharing personal stories (Kupetz, 2008). Both positive and negative examples of technology used to help students learn are cited. Therefore, the best practice in the use of technology is called into question. Are teachers following the ISTE's National Educational Technology Standards (NETS) to educate students and is technology being used to teach higher order thinking skills, an aspect of the standards?

Need for the Study

As Levin and Wadmany (2008) state, "many questions regarding the effective use of information technologies still remain unanswered" (p. 236). There

are only a few studies demonstrating the applications of a particular software program or a piece of hardware in the field of family consumer sciences. There are very few inquiries demonstrating family consumer sciences teachers' use of technology to teach higher order thinking skills. Recent reports have not shown whether family consumer sciences teachers are using technology to affect students' ability to be critical thinkers. As Miri, David, and Uri (2007) point out, there is a "gap between theory and practice…[with] teachers who claimed to purposely teach for the promotion of higher order thinking skills" (p. 355). Astleitner (2002) states that there is no study, in the area of science, that verifies the learning of critical thinking skills through computer usage. Contrarily, this researcher did find such studies in science but not in the area of family and consumer sciences, which is why this study is being conducted. Family consumer sciences teachers design their curriculums around authentic real-life skills. Technology is a part of everyone's life as we live in a growing technological world. It should be included in all family consumer sciences teachers' curriculum to better prepare students for their futures.

It was found that technology-rich high school classes lacked the following in their curriculum: "open-ended problem solving, real-world clients, group work, student autonomy," and the chance for students to be creative (Ge, Thomas, & Greene, 2006, p. 319). These skills relate to the higher order thinking skills of analysis, synthesis, and evaluation (Johnson & Lamb, 2007). Contradictory to what was cited earlier, students in another study felt uncomfortable discussing ideas online. "I felt more comfortable talking with people face to face. I had a

feeling that if I voiced my opinions on the web, I would be talking to the whole world" (ChanLin, Huang, & Chan, 2003, p. 19). These students are the same students who will soon be in college and offered online classes. If they are having a poor experience now, perhaps they will be discouraged from what is becoming the new method of higher education learning. There is a necessity to find the balance between using the newest technology and traditional teaching methods. It is not always the best outcome to instruct in a paperless environment, yet there are many lessons that are best taught using technology. This study determined if and how family consumer sciences teachers were using technology to teach higher order thinking skills and if teachers felt supported enough to use technology. Do family consumer sciences teachers obtain the training needed to instruct students through the use of technology?

Problem Statement

Teachers are constantly encouraged by district curriculum directors and their principals to use technology in their classrooms and to teach higher order thinking skills. While examples are often given in science and social studies, they are rarely provided in the field of family and consumer sciences. Are family consumer sciences teachers already using technology and meeting the International Society of Technology Education's National Educational Technology Standards, which include higher order thinking skills, and if not, in what specific areas do they need more training? This study attempted to discover the types of technology family consumer sciences teachers were using in their classrooms and if they were using technology to teach higher order thinking skills.

Definition of Terms

The following are definitions for commonly used terms in this study.

- Educational technology includes hardware (computers, handheld devices, printers, digital cameras), software and content applications (programming classes, productivity software), and media (the Internet and videoconferencing)" (Washington State, 2002).
- ISTE or International Society for Technology in Education is an organization whose mission is to advance and improve the use of technology in education.
- NETS or National Educational Technology Standards are the principles written by the International Society for Technology in Education (International Society for Technology in Education, 2008a).
- Higher order thinking is defined as "the top three levels of [Benjamin] Bloom's Taxonomy: analysis, synthesis, and evaluation" (Johnson & Lamb, 2007).
- Family consumer sciences professionals are defined as those who

> "provide guidance and practical knowledge about the things of everyday life, including human growth and development, personal behavior, housing and environment, food and nutrition, apparel and textiles, and resource management, so that students and consumers can make sound decisions and enjoy a healthy, productive, and more fulfilling life" (American Association of Family and Consumer Sciences [AAFCS], 2003).

Access Plan

All family consumer sciences high school teachers in the Northern Illinois Region were contacted by email and asked to participate in the study. The cover letter was emailed to participants as well as attached on the provided link to the SurveyMonkey® web site (SurveyMonkey.com, 2008). Once teachers followed the link to the site, the cover letter again explained the research and asked teachers to sign an electronic consent form. The teachers were then directed to the online survey. A reminder email was sent two weeks from the initial email asking again for participation.

Theoretical Framework

Benjamin Bloom created his well-known cognitive taxonomy in 1956. This hierarchy describes skills students are expected to learn from easy to difficult levels. Huitt (2004) defines each step and provides sample verbs to demonstrate the type of activities students should be able to do. The majority of teachers instruct and test at Bloom's lowest levels of the taxonomy, although they are encouraged in teacher education classes and by their principals to teach at the higher levels. Students were found to retain more information after being taught using higher order thinking skills. The levels of Bloom's taxonomy, from lowest to highest, are knowledge, comprehension, application, analysis, synthesis, and evaluation (Huitt, 2004).

As Cruz (2003) explains, Anderson and Krathwohl revised Bloom's taxonomy in 2001. Their six levels are remember, understand, apply, analyze, evaluate, and create (Cruz, 2003). This new taxonomy is not necessarily hierarchal in nature although as Bailey (2002) explains, the first two levels would usually need to come before the other four levels. Using the new stages assists teachers in deciding the "type of cognitive processing" they want from their students (Bailey, 2002). Teachers are to "use the noun in the objective to determine what is being learned…and the verb used in the learning objective [to] determine which cognitive process dimension" to use (Cruz, 2003). For example, if one wants their students to recall the names of particular kitchen utensils by viewing the object, they are asking the student to demonstrate factual knowledge using the cognitive process of the first stage, remember. The reason for using this process is to be aware of the level of cognitive thinking one is asking their students to accomplish.

Educational Significance

Determining family consumer sciences high school teacher's specific use of technology provided insight as to what kind of support these teachers may be lacking in order to meet the ISTE standards. If teachers did not report using a variety of technology in their classrooms, further research would need to be done as to the reasons for this. Is the technology not available, do they not know how to use it, or do teachers not want to spend time updating their curriculum? Another significance

would be if family consumer sciences high school teachers were not aware of the ISTE standards, as it would be probable that other disciplines were lacking this knowledge as well. Professional development leaders should focus learning activities on alternate topics, as it was shown that family consumer sciences high school teachers are using a variety of technology resources to teach higher order thinking skills, evaluate students, and conduct their school business.

Limitations

The limitations of this study include the particular region of Illinois used and the subject matter studied. Not all high schools in the Northern Illinois Region offer family consumer sciences classes. Some schools have one teacher in the department, while others have four or more. Certain districts have more knowledge in obtaining grant money so may have more technological resources. As the survey population is limited to one region, the results were based upon a limited number of people's ideas.

The data collected will be restricted by the technology the schools have purchased and the ability of the faculty. Depending on the particular subjects each educator teaches, they may have a varying degree of opportunities to incorporate technology into their curriculum. Another limit is the technology that has been created for the field of family consumer sciences. There are many more programs available in core subjects such

as math and science. The methodology used in this study was a quantitative and qualitative survey based on teacher's perceptions.

Depending on the types of students each teacher has and the pupils' technological abilities, the results of the study will be different. Those teachers who have technologically advanced students will be able to teach starting from a higher-level use of technology. Teachers who have low-level users of technology will have to teach their students the basic skills such as how to make a simple power point presentation, before assigning a project. As the survey was only available online, this study made the assumption that family and consumer sciences teachers were able to access and use the SurveyMonkey® web site. There may be some unforeseen technical difficulties, which prevented a teacher from participating in the study. This study can only begin to determine if the use of technology is dependent on training in technology. It focused specifically on how technology was being used in family consumer sciences high school classrooms and if general technology training had an effect on the teaching of higher order thinking skills using technology.

Delimitations

One delimitation of this study which may affect the generalization was that only schools in the Northern Illinois Region were studied. It may be that the results of the study can only be judged against other similar regions in comparable Midwestern states. As the data is from the teachers' viewpoints, their background in technology and their knowledge on how to apply higher order

thinking skills in the classroom may produce different results. This study is only looking at family consumer sciences and therefore may not necessarily be generalized to other high school subjects.

Conclusion

It was determined that family consumer sciences teachers are using technology to teach higher order thinking skills and they do feel sufficiently supported and trained to do so. There is considerable data to support the positive effects of teaching students higher order thinking skills and an equally great amount of information on using technology. A smaller quantity of data is available regarding the combination of the two skills. Limited studies have been conducted using the International Society for Technology in Education's National Educational Technology Standards, which all teachers and students are recommended to be following. This study hopes to increase the awareness of the standards in the family consumer sciences area. Bloom's taxonomy, a well-known teaching method, was used as the basis for higher order thinking skills. Although the study is only looking at the Northern Illinois Region, the data may be generalized to similar demographics areas. The specific examples teachers provide as to how they are teaching certain higher order thinking skills using technology will be useful to any family consumer sciences high school teacher and possibly those in other subject areas.

CHAPTER 2: LITERATURE REVIEW

Introduction

Technology is a point of much concern for educators who are trying to incorporate it into their classrooms, and school districts who are trying to afford the expense. Should every student have their own laptop? How much technology is necessary for students to compete with those from other schools? Questions such as these are being researched in order to prepare today's student for tomorrow's workforce. Teachers use computers to instruct students, handle administrative tasks, and correspond with parents (Rother, 2004). The International Society for Technology in Education (ISTE) has devised National Educational Technology Standards and Performance Indicators for teachers worldwide. How did this organization begin and why did they create their standards? Included in the standards is the use of higher order thinking skills. Teachers have been trained for many years to use Benjamin Bloom's taxonomy of higher order thinking skills to help their students become critical thinkers. This review of literature will focus on how teachers are expected to incorporate critical thinking skills into their lessons. Lastly, the field of family consumer sciences, or what used to be called home economics, has transformed itself in order to stay current with the configurations of today's families. What does the field of family consumer sciences teach and what innovations are teachers using? The latest technology used in this field will be discussed.

Technology

Student's Benefits from Technology

A number of researchers have noted benefits students acquire from the use of technology. Seventy percent of students in a computer design class stated that they preferred completing hands-on assignments rather than listening to a lecture (Neo, 2003). One might think the figure should be higher but one must take into account the different types of learning styles students have such as visual, spatial, and auditory. Many students in online classes, for example, have expressed feeling less pressure when discussing topics in an online platform versus face-to-face discussions in an actual classroom (Wassell & Crouch, 2008). When comparing individual versus small groups of learners, it was found that a cluster of students produced superior outcomes and used more cognitive thinking when using computers than did an individual (Taylor, Castro, & Walls, 2004). One could argue that people need to learn how to communicate in-person but today a growing number of transactions are taking place online, making one-to-one communication less of a necessity. A nation-wide study showed 62% of teachers indicated that computers positively affected students' standardized test scores (Rother, 2004). In another survey of 110 student teachers, 91% expressed that the use of technology "increased student learning" (Klecker, Hunt, Hunt, & Lackner, 2003, p. abstract). Students themselves are acutely aware of the greater capacity in using technology. Taking an online class, for instance, can be a frustrating experience, but by the end of the course students become quite familiar with the technology. Other technological benefits noted from the use of

blogs, an online platform where students can write back and forth to each other, were the gain of new ideas from discussing issues and receiving feedback from classmates (Wassell & Crouch, 2008). These technology skills are transferable to the workforce, as most jobs today require the use of technology, which often includes a computer or keypad (Zucker, 2004).

Among students, the use of computers for research is common. Fifth grade science students reported learning how to locate information online and problem-solving using the computer. Teachers instructed their students in data-entry methods as well as how to tell if a source is reliable. Students then learned to use a scanner and webpage software to present their findings (ChanLin, 2008). A professor from Michigan State University explained that a benefit of technology was that it makes the schoolwork students do more authentic, as they can apply it to real-life situations. To make student's class work more worthwhile, students should be sharing what they create with others, besides simply turning it in to the teacher (Young, 2008). An example of this would be having students create pamphlets about parenting. The students could scan the pamphlets and post them online perhaps as a link from the health department or library. This would educate others about the chosen topics and the students would feel that their work was more valuable and therefore they might put forth more effort.

A recent example of technology is the use of digital textbooks. College students can now purchase their textbooks or even specific chapters of a book to view online. These new types of books can be read page by page, highlighted, and/or printed. Students pay half the cost of a physical hardcover book and they

do not have to carry around heavy books. Many textbooks can now be found online. Since many students already carry a laptop with them, they will have all their materials and a means to collect and write data all on one device. Professors who preferred a variety of textbooks were able to choose chapters from a few different books allowing students to pay only for the chapters needed (Kupetz, 2008).

A common field trip for eighth graders is to visit Washington DC. Not all schools or students can afford such an expensive trip. Some students may not physically be able to attend the excursion. Students can now take virtual field trips to popular educational destinations such as Washington DC. A computer web site shows a video as if one is visiting sites such as the capital, Congress, and the White House (Taylor et al., 2004). If the school has the means to connect to the Internet, the possibilities abound.

The use of technology has improved communication between teachers, students, and parents. Many educators are posting their “class notes, homework, assignments[,] and other information to a school’s Web site” (Rother, 2004). This allows students who are out sick, especially those with a more serious illness, not to be delayed with schoolwork. Parents can look at each class their child is taking and discover resources to help their student with homework or study for an exam. Many more parents are using email to communicate with teachers rather than the telephone. Email is useful to send attachments such as a list of assignments the student is missing or the instructions for a project. In addition to

the above-mentioned benefits, technology is also being used by teachers to manage students in their classrooms.

Classroom Management Using Technology

In order to teach students to be self-directed and make wise choices, Bellarmine College Preparatory High School does not use an Internet filtering system. Instead, librarians use a monitoring system called Vision, which allows them to see what is on multiple computer screens from one central terminal. Librarians can send a text message to a particular student or close a student's screen if they are viewing an inappropriate site. Students have in-turn stopped visiting gaming or chatting sites and they do not search for unsuitable material (Weber, 2008).

Another use of Vision allows the teacher, or whoever is demonstrating a concept/skill, to lock a student's mouse and keyboard. Locking the screen causes the student's screen to show exactly what the demonstrator is doing and therefore students will be less likely to be off-task (Weber, 2008). This type of software is perfect when instructing an entire class in a computer lab, but what can be done to stop students with individual computers from viewing inappropriate sites throughout each class period (Zucker, 2004)? More research is needed to determine if Vision would work in this type of situation. Students utilize computer labs for a variety of educational reasons, as will be discussed.

Technology is used for numerous functions within a classroom. Does it demonstrate a lack of teaching skill when one allows the computer to teach the students or is this considered independent learning? Astleitner (2002) would

disagree as he believes that as long as the teacher is monitoring the evaluation process of learning, it is acceptable for students to learn via technology (Astleitner, 2002). Many software programs are ideal for individual learning. For example if the student is a fast learner and completes the first lesson, the computer may generate a review lesson or create a harder set of questions. At the same time, a child who needs more practice can easily be accommodated. The software will simply ask reformulated questions at the same or an easier level. Using programs such as these saves the teacher precious time and may allow them to give individualized attention to other students. As a result, the teacher does not have to slow down the faster students while helping others catch up. It also becomes unnecessary to create multiple assessments at various levels. One could simply use computer-generated lessons (Neo, 2003; Strickland, Salzman, & Harris, 2000).

Today's software records students' skills as they progress through their lessons. For example, a typing program can calculate the students' speed, number of errors, and keep track of which lessons have been completed. The teacher can adjust the functions of the software as needed such as requiring students to complete each lesson in its entirety before moving onto the next lesson. Technology is also used to communicate with parents and the community on daily classroom occurrences. Email has become an often-easier way to reach parents. The teacher can attach to it an update of the student's grades and missing work. As most parents work during the day they may not be available by phone but may check their email. Many teachers are now creating web sites,

which include classroom updates, assignment listings, and resources. These sites are accessible to anyone looking for information on a particular subject or beginning teachers looking for curriculum ideas (Strickland, et al., 2000). Other positive results from using technology in the classroom include students getting "immediate feedback, self-paced learning, and individualized lessons" (Edmonds & Li, 2005, p. 2). These issues are challenging for the teacher to provide students with in an overcrowded classroom and/or a classroom containing multiple levels of students. Next, specific examples of how technology is being used in the curriculum will be discussed.

Technology In Curriculum

"ICT [Information and communication technologies]," it was said, "can change teaching and learning by being a source of knowledge, a medium for transmitting content, and an interactive resource furthering dialogue and creative exploration" (Levin & Wadmany, 2008, p. 234). Technology has been demonstrated to be beneficial to students but the teacher must plan its use appropriately. Teachers may feel that they have to add technology into their already-set lessons as an extra lecture or special occasion rather than fully integrating it. As one teacher complained, "How can I realistically add computer activities to [an] instructional day that is already full?" (Labbo, 2006, p. 21). Rather than an addition, technology should be a "partner in teaching and learning" (Levin & Wadmany, 2008, p. 251). One's content does not necessarily need to change but the way in which it is presented can be restructured (Voogt & Pelgrum, 2005). When the teacher is familiar with using technology, he/she will

be more likely to incorporate it into their daily lessons. In college, it is quite common for students to take notes directly on their laptops rather than in a paper notebook (Kupetz, 2008). Teachers can use the computer to teach students how to organize their notes, highlight them, and create tables and charts as a study guide to improve study habits. The “interactions between teachers, students, and technology” must be understood for technology to be a positive influence (Levin & Wadmany, 2008, p. 237). Technology is vital to incorporate into today’s lessons because, as is often said, current students may end up with a job that does not even exist at this moment (Voogt & Pelgrum, 2005).

Technology is being used in the classroom for teleconferencing between students and researchers in the field, taking virtual field trips, and communicating with students in other countries. Interacting with students their age is a positive energy which the teacher can use to connect students with their peers across the world. Students then start to realize how similar they are to others and they can discuss issues of common interest. However, one teacher warned, although technology skills are important, students must also learn to be “adaptable, creative, and innovative” (Young, 2008, p. 351). The question is, can students learn these skills through the use of technology? At a high school in New Mexico, students made a web site about their city. They included interviews with senior citizens and historians, created a digital map, and a virtual tour of the area. These items were posted online along with short stories written by students. The web site was very well-received by the city (NEA Today, 1999). This is an example of a real-life activity done for a live audience.

Science is an area of education that often uses technology. ChanLin (2008) describes how students in a science class were taught to conduct research for an experiment, use software that interpreted the data they collected, and then use presentation software to share their findings. Rather than keep a handwritten journal, these students recorded their data on the computer so that it could be analyzed. They then typed their observation notes as well (ChanLin, 2008). ChanLin (2008) also noted that students learned Boolean Logic concepts such as how to use the words *and*, *or*, or *not* when searching in a database. For example, searching for the words *cats and mice* will retrieve information that includes both animals. If one had typed *cats or mice* he/she would gather data on either cats, mice, or cats and mice. Finally, one could search for *cats not mice*. This would return information related to cats that did not mention mice. Other technology used included digital cameras to take pictures, which were then incorporated into the students' presentations, and software such as Microsoft Word and Excel. It was noted by a teacher though that when students are expected to use technology to complete assignments, that they must be given ample time to practice and learn to use the technology. This may mean needing more time than the teacher planned for (ChanLin, 2008).

Physical education classes are using technology as well. Dillon (2008) points out that since the wide use of "the Internet, instant messaging, video games, and cellphones…" there have been many more obese children (p. 32). To help combat this problem, gym teachers are now using pedometers and software to walk virtually across America (Dillon, 2008). The teacher and

students can chart how many miles they walk or run using technology. Physical education teachers are also using a video game called Dance Dance Revolution, or DDR, as part of their curriculum. This game has players dancing in correct rhythm and foot patterns to music and is very popular with students (Dillon, 2008).

Labbo (2006) offers a few suggestions for being successful when using technology in one's curriculum. Teachers should demonstrate computer usage throughout the day by completing basic tasks such as typing a letter, looking up the weather, or viewing a news story. This shows students the resourcefulness of computers. The author explains that by matching up students from different schools through email, the students learn to communicate better and practice their writing skills. A third suggestion is to incorporate graphic organizers such as a web graph, videos, pictures, and audio along with written and spoken words. This becomes a stronger lesson for students then having them simply look at plain black and white overhead slides or listen to the teacher lecture (Labbo, 2006). Another form of incorporating technology into one's curriculum is to teach online.

Online Teaching Methods

Online learning is the latest teaching platform being offered at many colleges and universities. One may be forced to take an online class because it is the only way a class is offered in one's program. Therefore, more students are finding it necessary to learn to communicate and be educated through websites such as Blackboard. Blogs, a rather new way to communicate online, are being

used in high schools to encourage students to discuss various classroom issues. Students all log-on in the same classroom and rather than talking face-to-face, they go online and type comments back and forth. The teacher and all the students can see what each other are writing so the teacher keeps the conversation on topic (M. Turek, personal communication, April 4, 2008). Blogging was found to encourage those students who would not normally raise their hands in class to participate (Wassell & Crouch, 2008).

At the site www.youtube.com, people can post and share videos (YouTube, 2008). One online teacher uses this technology to share a conference lecture with their students. Rather than sending everyone a CD of the presentation, it was easier and free for students to view the lecture online at YouTube (Kupetz, 2008). It was suggested that teachers must connect students' technology activities with their pre-existing knowledge and interests. This makes the learning assignment more meaningful (ChanLin, 2008). Another discovery was that students responded by writing deeper, more meaningful assignments online when the topic has already been discussed in the classroom (Wassell & Crouch, 2008). One online teacher suggested teaching, "as though each student was the only one" (Edmonds & Li, 2005, p. 5-6). This method made students feel like their personal needs were taken care of (Edmonds & Li, 2005).

It was found in a study using over six hundred university students, that those in online classes did either as well or better than those who attended on campus lecture classes. Those who took online classes though were required to attend a few face-to-face lectures, which proved to be beneficial over those who

took a strictly online class. These universities are now considering offering many more classes online perhaps with the stipulation that students would have to meet on campus at least twice a semester (Scheines, Leinhardt, Smith, & Cho, 2005). Although many positive results have been discussed, there are negative consequences or results to introducing technology into education.

Problems with Technology

Though technology has many benefits for teachers and students, there are a few setbacks when using hardware and software. One daily issue facing teachers is students' use of technology as the newest medium for cheating and plagiarizing. Students are now texting answers to their friends, using the Internet to buy or share papers, and copying entire paragraphs of research into their papers (Kupetz, 2008). For these reasons, cell phone use has been banned in many high schools and some schools are using sites such as Turnitin.com, which compare students' papers with thousands of other resources to detect plagiarism.

Another problem with technology is that it frequently breaks, freezes, has a glitch, or does not save one's work. Occasionally, a single computer out of all the schools' computers will not connect to the Internet or the school's server (Weber, 2008). Authors from the Netherlands felt that the problem with using technology in the classroom was not a hardware or software problem but rather that the teacher's curricular goals did not match their ability to use technology to meet these goals (Voogt & Pelgrum, 2005). In another study, teachers reported that the problem with using computers is no longer concerning management and

ease of use, the issue now is how to incorporate computers into one's lessons (Espinosa & Chen, 1996). The educational software may not align with the state standards or the teacher's textbook. Teachers may also be less apt to use technology because they have to learn how to navigate through it and change their teaching strategies (Levin & Wadmany, 2008). Unless teachers are collaborating with their department members and the district curriculum director, the method of using technology in the classroom rests solely upon the teacher (Zucker, 2004). For students, this may mean getting a non-uniform education depending on the individual teacher's capabilities.

In some schools, lack of access to technology is the reason it is not being integrated more frequently into teachers' curriculum (Levin & Wadmany, 2008). Some schools have only one or two computer labs for the entire student body, which means that the teacher has to plan to use the lab(s) months in advance. If students are absent, there is no way for them to go to the computer labs to make up the assignment because the labs are unavailable. A lack of computers for students to use and the low quality of available technology were the top technology concerns found in a nationwide survey (Rother, 2004).

Teachers need time to become skilled at new hardware and software and even more time to rework their lesson plans to include new technology. They may be afraid that their students will know more about technology then they do and therefore feel threatened. This may result in teachers not using technology. As one teacher complained,

> "[technology] required me to change my ideas about teaching and learning, which was difficult; It is hard to accept the notion that a teacher

> no longer supplies knowledge, and that you are supposed to learn from your students; It is hard to learn new ideas at the same time as practicing them in the classroom" (Levin & Wadmany, 2008).

Students, as well as teachers, may be unsure of how to use technology and therefore feel frustrated (Edmonds & Li, 2005). Teachers cannot assume all their students are as or more knowledgeable about technology as they are. Schools often do not train their teachers in how to use the technology they purchase. Just how much and what kind of technology training are teachers getting?

Teacher's Training Using Technology

"The main obstacle that prevents teachers…using [technology] in their classrooms is lack of adequate preparation" (Levin & Wadmany, 2008, p. 259). As far as training at the college level, only 29% of states had a technology course requirement for new teachers. Other states, such as Florida, offer incentives such as a Palm Pilot to those teachers who pass a rigorous technology course (Rother, 2004). In a study by Taylor, et al. (2004), teachers were tested on their skills and use of technology. After taking a "'Technology Standards for Teachers'" class, teachers were each given a laptop, put into groups of three, and asked to create units and lessons using technology (Taylor et al., 2004 p. 126) . The units had to incorporate at least three disciplines such as math, science, or English. The teachers were expected to share their lessons and newly learned skills with other school faculty. A post-test of the teachers' skills and use of technology was administered and a significant increase was found in the "frequency of use and skill level for technologies and applications" (Taylor et al., 2004, p. 129). Particular methods used to instruct the teachers were hands-on learning, authentic activities, and the chance to work with their colleagues (Taylor et al.,

2004). These are the same methods recommended by many scholars for teaching students.

Many teachers complain about the lack of technology training they receive. School districts need to spend more time keeping their staff up-to-date with any type of technology available to them throughout the school (Young, 2008). Grant money is available to train teachers to use technology so funding does not have to be an issue. A list of available grants is in the publication "Technology and Learning" from http://techlearning.com (Kingsley, 2007; NewBay Media LLC, 2008). Zucker (2004) points out that according to the No Child Left Behind Act (NCLB), teachers are required to help students become comfortable using technology though there is no mention of exactly how teachers are to be trained in order to teach their students. When any new technology is introduced, schools should at the same time, provide professional development (Zucker, 2004). From a survey of 110 student teachers, the following were items in which the teachers wanted more training: "database, spreadsheet, desktop publishing…, digital video, web page development … [and] publishing, [and] content specific software" (Klecker et al., 2003, p. 8). These pre-service teachers did feel confident in teaching and using: word processing, email to communicate with others, the television and VCR, or an overhead projector. Reasons student teachers did not incorporate technology more often into their lessons were the lack of equipment, no support from other teachers or administrators, and logistical difficulty in using the computer lab (Klecker et al., 2003). Similar to students, adults have a variety of learning styles. Teachers must be taught to use

technology using a range of methods (Levin & Wadmany, 2008). Some will learn better with written directions and visuals, others by multiple sessions of hands-on experiences.

A five-step process is described by Coggins (2008) as to “how to introduce new technology to…staff.” The first phase is to introduce the technology to teachers through a limited supply of the technology. In the example, one interactive whiteboard was purchased and demonstrated. Teachers had a workshop on using the board and were given time to practice with it. A pretend lesson was shown using the board. The second step was to purchase more boards because once teachers were slowly introduced to the one board, many of them wanted to use it. The third phase of introducing the new technology was to plan where to put each board and create a sign up system to share the boards fairly. Next, teachers were provided with more training and illustrated directions. The fifth and final stage of the process was to use the technology outside of the classroom. In others words, the teachers felt confident enough to show other staff and school board members how to use the interactive whiteboard. Teachers also used the board to make presentations at PTA (parent teacher association) meetings (Coggins, 2008). This method of slow introduction could easily be applied to any technological equipment or software.

The publication NEA Today (1999) offers three suggestions for school districts in how to best support teachers in the use of technology. The first suggestion is to offer multiple training sessions on new hardware and software at the teacher’s own school (NEA Today, 1999). One cannot expect everyone to

comprehend numerous new concepts at once. People may think of follow-up questions to ask later, after they have time to digest and practice what was learned. This brings up the second suggestion, that it is vital to have real people readily available to offer both software support and to be there when the hardware is not functioning (NEA Today, 1999). The lack of support personal means a long wait to get any problem fixed. Many school districts do have at least one person or a company who is devoted to solving their schools' technological problems. Teachers and staff can email or call with any questions and hopefully they will get a response in a timely fashion. The third suggestion NEA Today (1999) gives is to offer technology itself only to those who are interested. This last idea may have worked when using technology in schools was a new phenomenon, but does not satisfy today's educational expectations.

One might argue that everyone should be made to learn the latest programs for the betterment of one's students. In terms of software, such as a grading program, there is usually little choice, with everyone in the district being expected to learn the new system. Recent laws require teachers in most states to "demonstrate their technology proficiency for licensure and certification" (National Education Association, 2003). One state expects teachers to take graduate classes in technology in order to be recertified. These new mandates are based on the International Society for Technology in Education's National Educational Technology Standards and the Elementary and Secondary Education Act. The Elementary and Secondary Education Act has three goals: "improving student academic achievement through the use of technology, assisting students in

becoming technologically literate by the time they finish eighth grade, and ensuring that teachers can integrate technology into the curriculum" (National Education Association, 2003). Many universities require their preservice teachers to incorporate technology into their lesson plans. Students should not be simply watching a computer screen but rather interacting with a program or web site (National Education Association, 2003).

The delivery method of technology training can play a large role in a teacher's opportunity to gain knowledge. For example, if teachers are offered training on a Friday from 3:30pm to 5:00pm there is a low probability that many people will attend. Sessions should be offered on teacher institute days during contracted hours. Another option is to offer "24/7 access to training" online (Rother, 2004). Rother (2004) discusses this as a possibility for those teachers who need extra training learning new school software. These educators could use the help component that is embedded in the program. Other teachers may be interested in earning CPDUs (continuing professional development units) online. With 24/7 access, they could choose when and where they wanted to go online and earn credits. One teacher stated,

> "I needed the school principal to support the new educational ideas and encourage me through the difficulties; The school superintendent's view affects the success of the change in the classroom-her [the superintendent's] participation in the workshops shows that she thinks the project is important" (Levin & Wadmany, 2008, p. 243).

Perhaps if administrators demonstrated using technology at more presentations, and were available to help teachers incorporate it into their curriculum, an increase in usage would occur. Another teacher commented that learning new skills along with her colleagues and being trained by colleagues was encouraging

to her (Levin & Wadmany, 2008). If one teacher learns a new technology skill, he/she should demonstrate it to his/her fellow teachers.

A teacher's previous experience using technology will have a great impact on their ability to be successful learning new skills (Zohar & Schwartzer, 2005). For example, some teachers may have the latest computer system on their home computers, use email everyday to send pictures and documents to others, and feel comfortable with learning new software. These teachers might be helpful in demonstrating and troubleshooting with their less proficient peers. Teachers who rarely use technology will fumble when playing a video cassette and have to put forth much effort when following directions on the computer. This low skill level group of teachers will require one-on-one training and necessitate learning at a slower pace. They tend to be more successful when provided with written and graphic directions aside from the verbal instruction. School districts must focus on getting these teachers comfortable using computers. Hardware and software training will likely need to be repeated in subsequent sessions, as these teachers may not learn everything in a one-time professional development workshop. Based on this example, which plays out in many school districts, whoever will be training the teachers, needs to be aware of the educators' technology background, experience, educational beliefs, and personal dispositions before planning a demonstration or lecture (Levin & Wadmany, 2008). As Levin and Wadmany (2008) proved in their case study of three different types of teachers, there is no perfect method to instruct teachers in the use of technology. As far as

exactly what technology teachers should be able to use, the ISTE has created worldwide standards.

International Society for Technology in Education

Background of ISTE

The National Council for Accreditation of Teacher Education (NCATE) and the International Society for Technology in Education (ISTE) created technology standards to promote the education of preservice teachers in higher education schools. NCATE would like to determine the link between a teacher's ability to use technology and their student's performance. The standards describe the task of the teacher as creating new technology tasks rather than simply using premade ones that accompany a textbook (Strickland, et al., 2000).

There are separate standards for teachers and students. High school students should be able to complete the following tasks:

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…” (International Society for Technology in Education, 2008b).

The National Educational Technology Standards (NETS-T) and Performance Indicators for Teachers are as follows:

1. “Facilitate and Inspire Student Learning and Creativity
2. Design and Develop Digital-Age Learning Experience and Assessments
3. Model Digital-Age Work and Learning
4. Promote and Model Digital Citizenship and Responsibility
5. Engage in Professional Growth and Leadership” (International Society for Technology in Education, 2008c).

If teachers are not even aware that these standards exist, they may not focus on teaching their students these skills. When the ISTE standards were recently introduced to the business department teachers at a suburban high school in

Illinois, the teachers had never heard of them (K. Millard, personal communication, October 10, 2008). Is the ISTE promoting their standards to educators?

These NETS-S (National Education Technology Standards for students) are designed to ready students for “a world changed by the Internet, digital communication, and a need to filter masses of information” (Amtmann & Poindexter, 2008, p. 281). The standards hope to increase creativity in students, rather than limit it. Jobs that are not necessarily being sent to other countries are those that require a creative mind. Standards in other subject areas are meant to be the end all of what a student must achieve. The NETS-S are a suggested way of learning and thinking. There are also standards for teachers and administrators so that those groups can help students achieve their own standards (Stager, 2007).

A project similar to the International Society for Technology in Education’s standards is the Technology for All Americans Project (TFAAP). The TFAAP was developed to explain standards that all students should be able to meet. The creators of the project felt that students should be introduced to technology beginning in kindergarten and continuing past their high school years. Specifics on what should be taught in each grade level are spelled out, similar to the International Society for Technology in Education’s standards. The authors suggest that further research is needed to gather qualitative data from educators on specific examples of integrating technology into their curriculum (Meade & Dugger, Jr., W. E., 2005). This study intends to gather such data.

The ISTE standards have been compared to and used injunction with the American Association of School Librarians standards and the Partnership for 21st-Century Skills. All three standards are used by teacher-librarians to ensure they are instructing students in the appropriate skills for which employers are searching. In particular, ISTE standards focus on the "thinking skills associated with intelligent use of technology" (Donham, 2008). These three standards also agree that students should be about to figure out solutions to information-related problems using technology. Students must also learn to evaluate critically, the information they find, which would mean using higher order thinking skills. Some of the fundamental skills which the ISTE standards say should continue to be emphasized are, knowing "the hows and wheres of saving and organizing files, an understanding of networked systems, file sharing, uploading, and downloading" (Donham, 2008). Students are also exposed to ways technology can be used to solve issues and therefore it is the intention that students have a positive feeling toward technology (Donham, 2008).

The educational group from ISTE, SIGTE, or Special Interest Group for Teacher Educators meets yearly with other groups at the National Technology Leadership Summit or TPACK, Technology Pedagogy Content Knowledge. The TPACK organization discusses how to best integrate technology into the curriculum. One member described the ideal situation, "A teacher who effectively integrates technology would be able to draw on extensive content knowledge and pedagogical knowledge, in combination with technological knowledge…[for] effective technology integration" (Pierson, 1999, p. 427).

Using the Standards

The state of Idaho pledged $50 million over five years to be used for technology in grades P-12. All Idaho teachers will be assessed on their technology proficiency as well. The ISTE standards will be used to determine instructors' skills, to ensure that graduating preservice teachers are competent in using technology, and to relate student learning to teacher use. Preservice teachers in Idaho "must pass all 25 ISTE standards to obtain their teaching certificate" (Strickland, et al., 2000, p. 3). In order for preservice teachers to gain enough experience and guidance using technology they are required to be put into classrooms with current available technology and a supervising teacher who is very familiar with the technology (Strickland, et al., 2000).

Michigan requires all its high school graduates to participate in some form of online learning. Each school district must have a technology plan describing the "curriculum; teacher technology training; infrastructure, hardware, technical support, and software; funding and budgets; monitoring and evaluation" (MI Dept of Education, 2006, as cited in Amtmann & Poindexter, 2008, p. 284). This level of detail should be initiated at school districts across the country. The technology plans are created based on the National Education Technology Standards (Amtmann & Poindexter, 2008).

The ISTE standards have primarily been used with preservice teachers to prepare them for their upcoming careers. There were 320 preservice teachers assessed in Idaho during a recent survey. It was found that 88% of them passed all of the standards.

> "The most frequent unmet standards of the students failing the assessment were the ISTE standards related to integration of technology into teaching and learning, specifically the standards dealing with using technology to assess learner performance and using technology to adapt instruction for learners with special needs" (Strickland, et al., 2000, p. 4).

Apparently, more preparation needs to take place in how to help those with special needs use technology. This study will determine how teachers in the field of family consumer sciences measure up to the ISTE standards.

A technology portfolio, based on the standards, is required of each Idaho teacher. The portfolio must include the objective of each lesson, "an analysis of the teaching-learning context," a method for teaching the plan to students of all capabilities, assessments, student work, and reflection upon these practices (Strickland, et al., 2000, p. 2). Software use must be demonstrated in the areas of "word processing, spreadsheet, database, presentation[,] and communication tools" (Strickland, et al., 2000, p. 3). Examples of these programs are Microsoft Word, Excel, Access, Power Point, and Outlook respectively. The ISTE National Educational Technology Standards also include higher order thinking skills.

The ISTE created standards used by universities for preservice teachers called "*Recommended Foundations for Teachers"* (Amburgey, 2006, p. 105). Northern Kentucky University's College of Education has been using these standards to train their future teachers. Three commons issues that educational programs face when incorporating technology into their programs is obtaining technology, figuring out how to use technology, and spending time recreating their curriculum (Amburgey, 2006). The ISTE standards helped with information on training teachers and getting grants to access the latest technology. In order

to solve the problem of a lack of time, a grant made it possible to relieve five University faculty each from teaching one of their courses and instead they spent time receiving technology training. Faculty were asked to write personal goals in regards to learning about new technology. They were able to experience the online learning platform, Blackboard, through a pretend class. Throughout the semester, the teachers were asked to reflect on their goals to determine their progress. This gradual process of experiencing and using technology allowed the teachers to feel more comfortable using technology. It also encouraged them to incorporate technology into their lesson plans for the preservice teachers. Once the five initial teachers finished the training, others participated in the learning experience. Twenty-three teachers in all have had the training so far and it was deemed a successful way to encourage educators to follow the ISTE standards and integrate them into their lessons (Amburgey, 2006).

At Brigham Young University, a study was done on preservice teachers incorporating the ISTE standards into their lesson plans. After studying eighty-three units, a significant correlation was found “between the instructional practice of ‘collaborative learning’ and ‘active learning’ and ‘research’ and ‘problem solving’ standards and between the instructional practice of ‘problem solving’ and the ‘problem solving’ standard” (Wentworth, 2006, p. 125-126). After participating in the lessons, students were found to be collaborating and using critical thinking skills (Wentworth, 2006).

ISTE Tools

In order to determine if a particular teacher or a department is correctly teaching the ISTE standards, the organization has created a free online observation tool, ICOT, or ISTE Classroom Observation Tool (MultiMedia & Internet@Schools, 2008). At the ICOT website is a checklist. Whoever is observing a classroom simply compares what they see to the checklist and marks it accordingly. Comments can also be supplied to create qualitative data. The online form is then sent to ISTE to have statistics created. The website also offers scenarios to guide educators as to how to implement the standards in their classroom (Andrews, 2008). The International Society for Technology in Education offers hard copy resources for teachers as well as web sites. Two examples are a book titled, *"Tablet PCs in K-12 Education"* and another called *"NETS-S Visual Arts Units for All Levels"* (Durrell, 2008, p. 44). Each of these sources help teachers incorporate technology into their classrooms according to the ISTE *standards* (Durrell, 2008).

Higher Order Thinking Skills

Bloom's Taxonomy

Benjamin Bloom created a hierarchal taxonomy to describe levels of thinking. His theory is well known and both taught and used by teachers worldwide. The taxonomy of high order thinking skills has since been revised and even a technology version was created. Techniques that instructors are using to incorporate Bloom's taxonomy into their curriculums and methods for teaching will be discussed.

There are six levels of Bloom's taxonomy. The first three, knowledge, comprehension, and application, require low-level thinking skills, while the top three, analysis, synthesis, and evaluation, require higher order thinking skills (Johnson & Lamb, 2007). Bissell and Lemons (2006) state that the top four, rather than three, levels use higher order thinking skills. "Critical thinking…[has been] highly correlated with students' achievements" (Astleitner, 2002, p. 54). In a survey of teachers from a school in northern Illinois, 71% knew about Bloom's taxonomy but only 24% were actually using his method of asking higher order thinking questions (Coleman, King, Ruth, & Stary, 2001). This exemplifies that considerably more training in Bloom's taxonomy is needed for teachers to comprehend it and use it in their classrooms.

According to the hierarchy, the first level, knowledge, is when students are asked to describe, identify, define, or memorize information (Bissell and Lemons, 2006; Johnson & Lamb, 2007). These types of questions are quite common in classrooms today. They simply require the student to memorize facts rather than to combine what they have learned and take action upon it. At the comprehension level, students might be asked to compare and contrast two items or to group items together, which is again asking them to recall facts (Johnson & Lamb, 2007). The third level, application, is more taxing then the first two levels. Drawing a chart, giving a report, or demonstrating knowledge are all examples of this level (Johnson & Lamb, 2007). As Bissell and Lemons (2006) explain, if one can apply knowledge learned in one area to other areas or situations, they are demonstrating application skills. To analyze is to be able to

dissect a problem and explain it (Bissell and Lemons, 2006). Asking students to arrange and prioritize information, skills that are rarely required on a typical multiple choice or true and false test, would be other examples of analysis (Johnson & Lamb, 2007). One shows the ability to synthesize if he/she can associate between different components or use the skills of reinforcing, integrating, collaborating, and designing (Bissell and Lemons, 2006; Johnson & Lamb, 2007). Finally, evaluation is shown when a student can determine the "quality of information" such as where it came from and if it is true (Bissell & Lemons, 2006, p. 67). Johnson and Lamb (2007) describe the evaluation level as using the skills of convincing, defending, judging, and summarizing. Implicit in the hierarchy is that teachers should think about what skills they want their students to achieve and create projects and assessments accordingly.

Higher order thinking skills overall "engage [learners in] …discovery learning, reasoning, organizing, and argumentation" (Torff, 2003). Critical thinking, a term sometimes used interchangeably with higher order thinking skills, is used when one must solve a situation, analyze a problem, find an alternative, or make a judgment (Bissell & Lemons, 2006; Howe, 2000; Miri, et al., 2007). It is also used to identify arguments, "consider…external influences on arguing, of [both] scientific analytic reasoning, and of logical reasoning" (Astleitner, 2002, p. 55). Being able to question what is known as the truth, making a sound judgment, and determining alternate solutions are skills that have been found in multiple studies to be related to student success and are highly sought out in the workplace (Astleitner, 2002; Coleman et al., 2001; Neo, 2003; B. M. Taylor,

Pearson, Peterson, & Rodriguez, 2003). Curriculum related examples of higher order thinking skills follow. Two more recent versions of Bloom's taxonomy will be briefly discussed.

Revised Taxonomies

In 2001 Anderson and Krathwohl modified Bloom's taxonomy. Their version is not hierarchal but rather two-dimensional. Levels include remembering, understanding, applying, analyzing, evaluating, and creating. The researchers devised a chart consisting of cognitive processing skills and knowledge dimensions (Bailey, 2002; Cruz, 2003; Morris, Porter, & Griffiths, 2007). As Morris et al. (2007) explains, the new chart clarifies "objectives for teaching, learning tasks, and assessment….in terms of observable behaviors…" (p. 159). Rubrics, too, should be aligned to the revised taxonomy so that students know exactly what skills they are to master (Morris et al., 2007). For example, a rubric for a book report might state that the student must demonstrate the concepts learned in the book by creating a poem about the characters. The focus is on conceptual knowledge and creative skills.

This revised taxonomy was given a technological revision by one of Blooms' students, Lorin Anderson. The remembering stage includes tasks such as using bullet points, highlighting, and using a search engine. Understanding is equated to Boolean searching (the use of "and" or "or") or subscribing to an online publication. The applying level would relate to playing a computer game or uploading material. To demonstrate analyzing, a student could place links in a document or be able to validate their resources. Evaluating is shown through

blogging or posting to a social network. Finally, creating includes programming, or publishing a document (Churches, 2008).

Uses of Bloom's Taxonomy in the Curriculum

Bloom's taxonomy of higher order thinking skills is being used in many school systems in multiple subject matters worldwide (Mahiroğlu, 2007; Neo, 2003; Zohar, 1996). Specific examples of higher order thinking skills are presented in a variety of creative lessons. A study done in science classrooms in Israel studied eighth and ninth graders and determined that the students were not using "scientific reasoning strategies" to solve problems (Zohar, 1996). After five months of higher order thinking education, these students were able to reason scientifically in 77% of the cases. Before the intervention, the number of students that used critical thinking skills was only 11%. The project, *"'Thinking in Science Classrooms'"* is being successfully used in many Israeli junior highs. Zohar (1996) has completed much research based on her study. The new skills students gained in the study were reasoning, retaining information, and transferring the information to another problem over time. In order to solve the science problems presented, students had to think logically, figure out which variables they needed to study, and define the various problems to solve. Next, students had to plan their experience in order to solve the problems. After finding a solution, students were to justify their answers (Zohar, 1996). This entire process required higher order thinking skills.

Coleman et al. (2001) researched fourth grade students who used a web site called Journey North to study geology, geography, and general science. The

instructor and students started their research by creating a KWL chart and then making a list of questions for which they needed to find solutions (Coleman et al., 2001). Creating a KWL chart is a task, which requires higher order thinking skills. Students, with help from the teacher, make three columns. In the first column students list what they already know about the subject. The second column is for what students want to know, and the third column is for what students have learned after the assignment is completed (North Central Regional Educational Laboratory, 2008). The goal of Coleman et al's. (2001) study was to increase the students' skills of working together, discussing issues, communicating, and giving presentations. The overall objective, which was carried out from the beginning of school year, was to determine when spring would arrive. Students collected data including sunrise and sunset times, migration patterns, and temperatures in different states. They also had to create and produce a weather forecast. Furthermore, the project included writing in the form of a narrative report and a weekly journal on butterflies. Technology was used in some of these lessons as students had to post their journals online and could ask questions of scientists through the Internet (Coleman et al., 2001).

When designing a curriculum based on Bloom's taxonomy it is often said, "less is more" (Torff, 2003). It is better to more deeply comprehend and be able to think critically about a small amount of material than to try to teach students a plethora of facts, which will likely be forgotten once their test is over. In terms of detailed examples from each of the three top levels of the taxonomy, to have students use the skill of analysis they can "make a flow chart,…arrange a

party,…review a work of art,…[or]…design a questionnaire" (Dalton, 2001). Synthesis would be used to "invent a machine to do a specific task," create a television show, "design a …book for [a subject]," or to "sell an idea" (Dalton, 2001). Dalton (2001) suggests the following evaluation activities, "prepare a list of criteria to judge a…show…conduct a debate,…[or]…write a letter to [someone]…advising on changes needed…."

It is not difficult for teachers in core subjects to find examples of lessons plans online that teach higher order thinking skills. This online network of information is a positive step to creating students who can think critically. One such lesson plan is a preschool curriculum about balls. Bogan and Porter (2005) provide many creative hands-on learning activities for students. In the knowledge level, students think about the different types of balls such as in sports. They also identify any circular objects in the classroom. To gain comprehension, students will create a ball book and make a collage of circles. Students will apply their knowledge of balls by exploring round foods and then eating them. Giving students a variety of types of balls and asking them to describe, compare, and contrast them encourages analysis. Students creating a ball shaped puzzle will achieve synthesis. The student will decorate the puzzle and the teacher will cut out individual pieces. Finally, students will evaluate balls by figuring out which of various types of balls would float and by guessing the number of marbles in a jar (Bogan & Porter, 2005).

Bloom's taxonomy has been used successfully in an algebra class. Students were required to write down their goals for the class and what they

hoped to learn. They then had to write what exact steps they planned to follow to meet their goals. This was done to make students more aware of how they were learning. By analyzing their own education, they noticed when and with what teaching methods they performed better. Following each test, students were asked to reflect on how they did and what they needed to do to obtain a higher grade. This required the skill of synthesis (Lerch, Bilics, & Colley, 2006). Another reflection gave students the chance to evaluate the group project experience and how they themselves performed as an individual member.

Dickinson and Reising (2006) creatively described how Bloom's taxonomy is demonstrated in one of the popular Harry Potter books (Rowling, 1999). Professor Lupin, one of Harry's teachers, takes Harry through all of the six levels of the taxonomy when learning how to get rid of a *Dementor,* a creature who steals one's spirit. Harry learns what a *Dementor* is and how to exonerate himself of it. The professor has Harry practice the spell by himself and then with an imitation *Dementor*. After each practice, Harry analyzes his mistakes and figures out how to improve. Harry eventually conjures up a powerful positive thought, which conquers the virtual *Dementor*. When Harry has to fight a real *Dementor*, he has the knowledge to do so successfully (Dingle & Harris, 2006). Aside from imaginary fantasylands, Bloom's taxonomy has been used in other countries.

In Turkey, Mahiroğlu (2007) studied teachers applying higher order thinking skills using project-based learning. Students have to analyze the resources and evaluate which are appropriate for their assignments. They then synthesize the information and create a product of their choosing. Students must

then present the project to the class for critique to see if it met the prescribed objectives (Mahiroğlu, 2007). All of the teachers mentioned above offered recommendations, which will be shared next, for applying curriculum in the classroom in order to achieve the greatest success.

Students in a science classroom in Israel are asked to think critically about the strategies they used to deduce research conclusions (Zohar, 1996). This is a wise strategy for any subject in which experiments are done. Even if students do not obtain the correct results, they should still be required to analyze their findings. In a Foods class, for example, when students are cooking an item such as bread and it comes out dense and dry, they should discuss and reflect what might have happened so they can learn from their mistakes.

Methods for Teaching Bloom's Taxonomy

How is Bloom's taxonomy being put into practice and what are the successfully proven methods being used? Lerch et al. (2006) explained that learning and reflecting should be done at the same time. By reflecting on one's knowledge one develops critical thinking skills (Taylor, 1992). Reflection helps students synthesize what they are learning and provides a basis to pose and respond to questions. A math teacher clarified that the goal of having his/her students write reflections was to have the students think about math in an emotional manner. The teacher discovered that students had a more positive response to math then they had previously because of their writing experience (Lerch, et al., 2006). Torff (2003) cites other methods researchers have recommended to teach higher order thinking skills including "discovery learning,

critique activities, problem finding and solving, project-based teaching, and reflective self-assessment." It was found that it was less plausible for new teachers to teach higher order thinking skills and more likely for them to teach simple factual knowledge. Experienced teachers displayed the opposite methods. They use more critical thinking techniques and spent less time teaching basic facts. These experienced teachers operated under the "less is more" viewpoint (Torff, 2003). Authentic learning has become one of the main goals in education. Teachers are trying to provide their students with meaningful assignments that carry over into their lives outside of the classroom. ChanLin et al. (2003) endorses the "task-oriented approach" as a means for authentic learning (p. 19).

Other teaching methods include having students use their previous experiences to create new knowledge (Coleman et al., 2001). As Fogarty (1997) explained, being able to think is a two-part process. The first component is learning the academic skills needed for the particular area. The second factor is gaining personal skills so that one can function as a normal person in humanity (Fogarty, 1997). Teachers do need to teach the basic subject matter but then must instruct how to think about and apply the information. There are a few simple ways to update true and false and multiple-choice questions, which are traditional testing methods. For true and false questions, ask students to explain why an answer is incorrect. Rather than a typical multiple-choice question, the teacher can have students analyze an issue or explain two viewpoints of an argument. Coleman et al. (2001) does admit that using these different critical

thinking techniques and asking students to explain test answers does take up more class time.

One must simply remember the less is more theory. Student education should be initiated through “multiple concrete examples” but then must rise above that with students reflecting, analyzing, and evaluating these cases (Zohar, 1996). The teacher can ask fewer but higher level thinking questions. In order for pupils to become critical thinkers, they cannot be passive learners. Teachers can no longer be thought of as the only source of information (Neo, 2003). The student must have some responsibility to investigate the unknown.

Science teachers describe their methods for incorporating critical thinking skills into their classroom. They create questions where students need both science knowledge and critical thinking skills. Then educators determine which specific skills in those two areas are needed. Finally, the teachers develop a rubric for each question. In order to make sure the rubric is sound and will be effective, the questions are tested by other teachers and experts in the field. The rubric is then measured by scoring a student’s work. If the skills the student demonstrated and the score on the rubric match, the teachers know they have both sound questions and a successful assessment. It was noted that students may receive partial credit according to the rubric if they are able to explain properly, the incorrect conclusions they arrived at (Bissell & Lemons, 2006).

The old adage of the instructor was the “sage on the stage.” This has now been updated to a role of a “guide on the side” (King, 2008). This notion takes some pressure off the teacher who does not have to know everything. It is

natural to tell one's students that they do not know the answer to a question but that the class will look up the answer together (A. Muni, personal communication, June, 2000). Students need be encouraged to ask questions rather than simply answer a teacher's question with a premeditated answer (Coleman, et al., 2001). The idea is to have students construct…rather than receive…knowledge (Taylor et al., 2004). Students need to learn to be self-directed and solve problems on their own.

Miri et al. (2007) in Israel demonstrated that critical thinking skills can be instilled into students when taught purposely. The authors studied teacher methodology and found that when educated, students could learn the skills of "dealing…with real-world problems, encouraging open-ended class discussions, and fostering inquiry-oriented experiments,…[which fosters] development of critical thinking capabilities" (Miri, et al., 2007, p. 353).

Technology and Higher Order Thinking Skills

When used successfully, technology can "stimulate problem solving and other thinking activities" (Means & Olson, 1994, p. 18). Technology has been shown to improve and teach higher order thinking skills. ChanLin et al. (2003) referenced Carr-Chellman (2000) when they explain how an online course should provide students with "substantial latitude and initiative to pursue their own goals" (p. 14). These tasks require the higher order thinking skills of analysis, synthesis, and evaluation. Teachers must instill in their students the will to want to be an educated person. This drive makes students excited to learn new topics and reach for greater understanding of the world. Creative thinking skills are required

in IT jobs around the world such as Malaysia (Neo, 2003). Technology is often used to conduct research but it must also be employed as a stepping-stone to the self-discovery of new relationships between ideas. Kennedy (1994) explains how interactive computer programs are a positive influence on the development of higher order thinking skills. One goal of current teachers is to have their students solve real-world problems, rather than complete basic worksheets. Today's software deciphers these types of problems into minor more manageable steps (Coleman et al., 2001).

In an online lesson on vitamins and health, students must submit two projects electronically. The learners had to analyze their vitamin intake, adjust their amount of supplements, and then evaluate why the changes were necessary. Students used relevant online resources to determine their nutritional needs. This activity is similar to what a nutritionist would do for a client or hospital patient. After having practiced analyzing their food intake, students were able to choose a healthier diet (ChanLin, et al., 2003).

Many teachers in all fields of education are requiring their students to create web pages in class. Photoshop and Dreamweaver are two popular software programs used. Students in a design class were asked to recreate a chosen image found in the class's database. Each group member had to take pictures and upload them into Photoshop. The photos were combined to construct a likeness of the original image. Then the group had to create a web site explaining how their new image was composed. This process required students to use higher order thinking skills (Neo, 2003). By posting the process of

creativity online, anyone else with a similar creative mind would be encouraged to try his/her own Photoshop design.

Problems with Bloom's Taxonomy

Although teachers want their students to learn higher order thinking skills and they may even know methods to teach them, they are not clear on assessing these skills (Bissell & Lemons, 2006). Astleitner (2002) stated that there were no textbooks about critical thinking so teachers have no resources; instead, many teachers stick with the typical methods of evaluation. With the advent of the scantron machine, teachers can create easy to grade tests including multiple choice, matching, and true and false questions. Although this assessment is easy to grade compared to a short answer or essay test, it does not demonstrate a student's thinking process and therefore does not require higher order thinking skills. Using a rubric, as discussed earlier, is one way to determine a student's higher order thinking skills. Teachers must be shown evaluation methods that require critical thinking skills.

Teachers also complained that it took a lot of time to create higher order thinking skills activities and even more time out of the curriculum for students to become familiar with the skills. More planning time is required and teachers will need to determine what to take out of their current lesson plans and replace with the new activities. The teacher must be comfortable using whatever technology they are demonstrating. This is becoming a more difficult task as technology is rapidly changing faster than most people can keep abreast (Coleman et al., 2001).

Family and Consumer Sciences

Description of the Field of Family Consumer Sciences

The study of home economics by the American Association of Home Economics, the original name for the American Association of Family Consumer Sciences, was created by Ellen Swallow Richards in 1909 (American Association of Family Consumer Sciences, 2008). The discipline of home economics was granted federal funding in 1917 with the Smith-Hughes Vocational Education Act. Soon after, in 1920 there were home economics clubs at high schools. The focus of these clubs were '"cooking, making clothes[,] and maintaining a happy household"' (Thaler-Carter, 2000). Twenty-five years later, the Future Homemakers of America was founded. Today this group of young men and women at high schools is called FCCLA, Family Career and Continuing Leaders of America. FCCLA sponsors competitions in related family consumer sciences categories. The focus includes '"improving family life and society through total family involvement in decision making, critical thinking, applied academics, …managing a family's resources…work ethics and 'employability' skills that lead to paid jobs"' (Thaler-Carter, 2000). A Finish researcher describes the goal of home economics as "to improve the quality of everyday life for individuals, families[,] and households in society" (Turkki, 2005, p. 273). Students in a Masters program included the following aspects of family consumer sciences, when asked what their subject matter entailed: basic human needs, community work, consumerism, and family and household care (Turkki, 2005). These are skills, which are not necessarily taught in the home today. Turkki (2005) feels

that through the creation of a conceptual framework, critical thinking skills can be put back into practice in the classroom.

There are National Standards for Family Consumer Sciences Education just as there are in other core subjects such as math and science. They

> "Include multiple categories on career pathways, such as: Consumer Services; Early Childhood, Education, and Services; Family and Community Services; Food Production and Services; Food Science, Dietetics, and Nutrition; Hospitality, Tourism, and Recreation; Housing, Interiors, and Furnishing; and Textiles and Apparel" (Thaler-Carter, 2000).

Many of these areas have had to update what they teach to stay in tune with society. For example, it has become more appropriate to teach clothing repair, and alterations such as hemming, rather than complete clothing construction. As a part of the consumer sciences standards, instructors are now teaching "how to shop smart, beware of credit-card scams, [and] protect the environment" (Thaler-Carter, 2000). Another newer course is an introduction to "Life and Careers" class, which is required in some schools for all ninth graders (Thaler-Carter, 2000). This type of class may teach the basic concepts of relationships, choosing a career, living on your own, and study skills.

A study in Japan brought to attention the wide variety of subjects taught in the family consumer sciences field. These subjects/concepts included "overcoming gender roles…strengthen[ing] self-respect," "improve[ing] home and family living," and "citizenship" (Arai & Ohta, 2005, p. 342). Family consumer sciences is studied all over the world through a group called the International Federation for Home Economics (IFHE). This organization works with groups such as the United Nations and UNICEF to better the living, working, and educational environments for people. One way IFHE tries to make a difference is

by talking to and surveying local youth (ages 12-18) in a particular community. The young adults' opinions are able to be heard and shared with the community so that their needs may be met. These needs are also shared with other youths around the world so that they might come to understand each other and see that they have similar views and issues (Betts, 2006).

Technology and Family Consumer Sciences

Technology is used in a variety of ways in relation to the field of family consumer sciences especially as the areas of study are so varied. A number of high school family consumer sciences departments around the country have student-run businesses. They may have either a food service or catering business and or a childcare center. Both businesses use technology in their day-to-day routines. As one teacher said, '"Our students use computer technology in every aspect of their café and catering business; it's all computer based"' (Thaler-Carter, 2000). Another family consumer sciences teacher predicts that with the reality of 24-7 Internet access and other technological impacts, '"teaching may become more like coaching, supervision[,] and guidance rather than actual instruction"' (Thaler-Carter, 2000).

A concern for those focused on consumerism is the lack of privacy because of new technology. With the advent of online banking and shopping has come the fear that our personal information will be stolen. Many people do not realize all the data that is being collected about them every day. Browsers track which sites consumers visit and then decide which advertisements to show. Students need to be taught to keep their identities safe when using social

networks (Makela, 2008). Family consumer sciences professionals have a responsibility to teach young people and adults to make wise choices with the use of technology. Technology can be used to improve “individual, family, and community functions, and relationships and can be appropriate…or not” (Braun, 2008, p. 1).

Can technology aid in critical thinking skills? Martin, Thompson, and Richards (2008) conducted a study with college students. They measured the students’ critical thinking skills using the California Critical Thinking Skills Test before and after students participated in online scenarios. Three scenarios were used; one on apparel merchandising and adolescent sexuality, another on a child who had gotten Type 2 diabetes, and the third on children and advertising. Three sets of students were used from three different schools. Each group was required to participate in the online scenario by taking an anonymous role in the situation. After participating in the role-playing, students were again administered the critical thinking test and all students were found to have scored significantly higher. The authors believed that the critical thinking skills were developed though “discussion, questioning, evaluation, and reflection. Discussions of real-life situations provide students with a safe space in which they can learn to communicate with others and do research in a professional and productive manner” (Martin, et al., 2008, p. 29).

The field of family consumer sciences also involves elderly care and concerns. In fact, adult education or adult care is often a required course in general family consumer sciences college coursework. Of equal interest, a study

done in Norway researched the use of microwaves for cooking versus using an open-flame gas stove. This research was done in response to a concern that elderly Norwegians who were isolated in the mountain regions needed a safer way to prepare meals. Elderly persons, family consumer scientists, and a Swedish research institute, met with microwave manufactures to determine the best design to fit the specific needs. After the new microwaves were produced, educational sessions were provided across Norway to teach people how to cook with the new technology (Roskey, 2006). This is just one example of the work family consumer scientists are conducting around the world. On the other end of the spectrum, is research done about preschool children.

Although videos of children interacting with each other provide an easy way to let students in a child development class observe children, the videos cannot compare to live observations. That is the opinion of Corpus and Eisbach (2005). These authors describe how to provide a live observation experience by inviting young children to a classroom and conducting structured activities. The playtime was video tapped for later viewing but the authors point out that the best experience is gained from first-hand viewing. They did not feel that technology (a video) could take the place of a live observation. Students who participated in the observation and activities with the children said that they could remember, later, what had happened better than if they had simply read about or watched the situation in a video (Corpus & Eisbach, 2005).

One form of technology that has proven to be successful is the use of clickers or audience response systems. Clickers are hand-held devices that are

used to let audience members participate in discussions by answering questions, as a form of assessment, or for learning in a game show format. Up to 1,000 people can participate, each with their own device. Responses are projected in the form of graphs, onto a screen hooked up to a computer. This method of audience participation increases the understanding of the concepts being taught (Gentry, 2007). Game show software has been designed to be used with the clickers that coincides with specific family consumer sciences textbooks, such as a foods and nutrition book (Gubler, Grady, & Croxall, 2008).

Beverly Card, CFCS, NBCT, (2008) gave a symposium titled "incorporating technology into the FCS curriculum." She explained how she has her students create power point presentations rather than the typical poster. Her students create digital portfolios of their work in her child development, preschool, and parenting classes, which they can then show future employers. The speaker offered to email a copy of the projects she created to participants at her lecture. Beverly Card CFCS, NBCT (2008) was an example of an experienced teacher who is constantly updating her curriculum as the technology and her students change.

Methodology

Survey

The method of surveying others has been used in multiple studies to determine classroom teachers' practices. Taylor et al. (2004) surveyed teachers before and a year after they received training in incorporating computer technology in their lessons. The authors asked questions such as, '"How often do

you use it?' (from Never to Weekly) and 'What is your skill level with it?' (from None to Extensive) for 37 technologies and applications (e.g., digital camera, scanner, electronic grade book)'" (Taylor et al., 2004, p. 128). A longitudinal study of teachers was conducted by Levin and Wadmany (2008) which used interview and questionnaires to gather data. This method proved to be quite valuable in the data collected including specific insights gained. In another study, 100 teachers were surveyed before and after participating in a four-hour long higher order thinking skills training session. After the training, the teachers had higher regard for the use of higher order thinking skills. Many of the teachers realized that they had already learned about these skills in their college training and still others recognized that they were already teaching higher order thinking skills in their classrooms. Teachers had not understood before the training, what these skills entailed. Once they were provided with examples, the methods for teaching the skills were more apparent (Marlow & Inman, 1992).

Coleman et al. (2001) used a higher order thinking skills inventory and teacher surveys among other methods, to collect data in their successful study. The survey determined the percentage of teachers who were familiar with Bloom's Taxonomy (71%) and what percentage believed that the current curriculum effectively taught higher order thinking skills (19%) Thirty two percent of teachers believed that the Internet would improve students' use of higher order thinking skills. The study also surveyed students and sought to determine what was needed to bring about positive change with regard to technology usage and the teaching of higher order thinking skills. Items lacking were enough time to

plan technology lessons, sufficient training for teachers, and enough technology equipment (Coleman et al., 2001).

Zohar and Schwartzer (2005) surveyed science teachers in Israel to discover their ability to teach higher order thinking skills. It was found from 150 participants that more biology teachers taught higher order thinking skills than physics or chemistry teachers. Fourteen teachers who had specific higher order thinking skills training were further studied through classroom observations. The authors' instrument contained 25 items, five of which were demographic in nature (Zohar & Schwartzer, 2005).

Torff (2003) conducted an experiment to determine if history teachers were teaching higher order thinking skills. Methodologies used were observations and a questionnaire that participants completed. Out of the 60 respondents, it was discovered that teachers who taught a greater proportion of higher order thinking skills had similar aspects in common. Those who were more apt to teach these skills had been teaching an average of 9.45 years, the majority (80%) had their master's degree and/or 30 hours beyond their master's degree, and 25% of the sample had their advanced degrees in the subject they were teaching (history). Teachers who taught more or fewer than 9.45 years did not use higher order thinking skills as often in their lessons. Information from the demographic survey questions was used for the independent variables (Torff, 2003).

Survey method was used in a Japanese study of family consumer sciences and civics teachers. Questions were asked regarding teachers' interest in instructing about gender and citizenship. From the 357 responses, it was found

that the family consumer sciences teachers and the female teachers were more interested in teaching about gender and civics. The civics teachers demonstrated more gender bias then the family consumer sciences teachers (Arai & Ohta, 2005).

Open-Ended Questions

Zucker (2004) discussed how to conduct research on the benefits of one on one computing, where every student has their own computer to use in school. The author created potential research questions that could be used to extract the requested data. These questions included:

- "For what sorts of tasks do *teachers* use technology, and in what subjects?
- For what sorts of tasks are *students* asked to use technology, and in what subjects?
- How often and for how long do teachers and their students use technology?
- How does classroom culture change (e.g., relationships between teacher and students)?
- Do teachers implementing a 1:1 initiative have the technical skills they need to use the technology effectively…?" (Zucker, 2004, p. 376).

These open-ended questions would likely give researchers and those investing in 1:1 computing needed data to support the use of personal computers in schools.

Klecker et al. (2003) conducted research of preservice teachers' technology experience and use. First, the authors administered an open-ended questionnaire asking

> "(1) How are you infusing technology into your student teaching activities?
>
> (2) What are the barriers to technology use in the schools in which you are student teaching? and…

> [3] How has infusing technology changed the learning process for your students…?" (Klecker, et al., 2003, p. 5-6).

The answers to these questions then guided the researchers to create a follow-up quantitative survey. The authors created 36 categories taken from the preservice teachers' answers (Klecker, et al., 2003).

Conclusion

Studies show the many benefits of using technology to teach students. This technology includes the method of teaching a lesson, the medium with which students create work, or the actual platform for a whole class. Technology helps teachers manage their classrooms and lets students receive individualized lessons. There are issues that still need to be solved in order to streamline the use of technology and make it more effective. One major problem is that teachers are not receiving enough or the right kind of technology training. What is it exactly that educators are lacking that would make their job easier and create better learning environments for students? This review of literature has only begun to touch upon these issues. Further research would need to be done to determine the specific needs of teachers in regard to technology training.

Although teachers worldwide are supposed to be using the International Society for Technology in Education's National Educational Technology Standards, it is presumed that only a limited number of educators are aware of them. No research was found on how to use the standards in a family consumer sciences curriculum or on the long-term effectiveness of the standards. This study conducted research in this area.

Technology is being used to teach higher order thinking skills as defined by Benjamin Bloom. It has been discussed how each of the skills can be taught and how technology can be used to achieve these goals. This study looked at whether family consumer sciences teachers are using technology to teach the higher order thinking skills as there were limited previous studies conducted on this topic.

The content area of family consumer sciences is broad and contains courses including fashion, foods and nutrition, interior design, consumer education, child development, and adult living. These subjects have not been studied or published about as often as other disciplines. There are a lack of lesson plans and curriculum designs compared to other core areas such as math or science. Although family consumer sciences teachers may not be provided examples pertaining to their own areas at district-wide professional development meetings, they may be able to make correlations between a math lesson and a foods lesson, where math is taught.

This study used a survey method to collect quantitative and qualitative data from family consumer sciences high school teachers. The purpose was to determine whether family consumer sciences were using technology to teach higher order thinking skills and if so, what methods or devices were they using. The literature supports the hypothesis that there will be a correlation between teacher's feeling they receive adequate support and training and the teaching of higher order thinking skills using technology.

CHAPTER 3: METHODOLOGY

Introduction

The purpose of this quantitative and qualitative study was to determine how family consumer sciences high school teachers use technology to teach higher order thinking skills. In order to collect data, a survey with Likert-type questions as well as an open-ended question was administered online. Research was done to discover if teachers were aware of the International Society of Technology Education's National Educational Technology Standards and if teachers are teaching according to these standards, which include the use of higher order thinking skills. Technology has been proven to teach other concepts such as multicultural education and how to use new technologies themselves (Wassell & Crouch, 2008). Studies have discovered that many teachers do not know how to modify their teaching methods to encourage critical thinking skills (Bissell & Lemons, 2006). Edmonds and Li (2005) collected data though an open-ended survey of teachers. Questions included "How have you used *technology with at-risk* learners? How *effective or successful* was this mode of delivery with these students?...What *suggestions* and/or *recommendations* do you have for other teachers in working with at-risk students using technology?..." (Edmonds & Li, 2005, p. 3). These direct questions provided the researchers with more candid responses then simply using a survey method. They found that the use of technology resulted in a more positive learning environment for at-risk students (Edmonds & Li, 2005).

Implementing a rubric based on Bloom's taxonomy is one way teachers were able to recognize that their students were learning the necessary skills. There are web sites such as Rubistar that help teachers create their own rubrics as well as offer a collection of rubrics on various subjects (4Teachers.org, 2008). This is a free website that school districts do not have to purchase, yet if teachers are not aware of it, they are missing a valuable resource. Do family consumer sciences high school teachers feel that they are receiving enough technology training? How are the teachers using technology in their classrooms? This study answers these questions.

Further research will need to be done to determine exactly how lessons are carried out in the classrooms. From data collected in this current study, a web site was created that lists lesson plan ideas for family consumer sciences teachers on incorporating technology and higher order thinking skills into their lessons. Observations of teachers giving lessons and interviews with the teachers would provide further information and examples.

Location

Research was conducted in the Northern Illinois Region, which is made up of six counties. Potential participants were family consumer sciences teachers from every high school in that region that offered a family consumer sciences curriculum. The location was chosen because of the wide range of classes taught throughout the schools in the Northern Illinois Region and the variety of student populations in each school. This region includes rural, suburban, and city schools.

Region Description

Illinois had a student population in 2007 of 2,077,856 students in 871 districts. On average, teachers had 12.9 years of experience and earned $58,275 (Illinois State Board of Education, 2008). This survey used the Northern Illinois Regional high schools as the location from which to choose subjects. This region includes Cook, Dupage, Grundy/Kendall, Lake, and Will counties. There are 3,131 schools that teach children in grades 9, 10, 11, and/or 12 stemming from 77 districts in the Northern Illinois Region (Illinois State Board of Education, 2008). It was found that only 4% of these schools offer a family and consumer sciences curriculum. The descriptive statistics of the participant's schools provided more detail as described in the next chapter.

Obtaining Permission from Teachers

The family consumer sciences teachers at each school were contacted by email with a shortened cover letter and a link to the complete online cover letter, consent form, and survey. The cover letter (see Appendix A) explained the purpose of the study and the results the researcher hoped to gain. The letter also emphasized the ease with which to take the survey online, following the provided link to the SurveyMonkey® website, and the importance of participating for the betterment of students and teacher support (SurveyMonkey.com, 2008). The consent form (see Appendix B) was based on the provided sample from Argosy University (Argosy University, 2008). Two weeks after the initial contact, all teachers were emailed again and reminded to participate in the study. Teachers had to agree to participate in the online survey in order to view and take the

survey. If a teacher chose not to participate in the survey, upon submitting their response, they were directed to the thank you page at the end of the survey. A teacher in this situation was able to then change his/her mind and agree to take the survey.

Subjects

Subjects in this study were high school family consumer science teachers from the Northern Illinois Region. There were 172 total participants who provided complete or almost complete survey results. The teachers were all certified as secondary level family consumer sciences teachers. The majority of the teachers have attended at least one training session in technology, teach in a suburban school with at least one other family consumer sciences teacher, and have at least $1000 for their budget. All participants teach in one or more of the Northern Illinois Region high schools.

Data Collection Methods

The list of all the high schools in Illinois was found on the Illinois State Board of Education's *Data Reporting and Progress* page (Illinois State Board of Education, 2008). The 2007-2008 Excel document under Illinois Public Schools by County was used. The researcher sorted the spreadsheet by grade level to include schools listing 9^{th}, 10^{th}, 11^{th}, and/or 12^{th} grades. The list was further reduced to the specific counties in the Northern Illinois Region. That reduced the list to 152 schools and 85 high school or unified districts. From that list, each school's web site was researched to create a list of family consumer sciences teachers in the region. Some schools had to be contacted directly to determine

which teachers taught family and consumer sciences classes. Five hundred and one teachers were identified. Each teacher was contacted by email after the Institutional Review Board at Argosy University granted permission to complete the study. The email included the cover letter and a link to SurveyMonkey®. The site included a cover letter and consent form explaining the research and asking teachers to participate. Once the teacher consented electronically, to participate, they were directed to the survey. Two weeks from the initial email, a follow-up email was sent to all teachers who had not responded, asking them again to participate. The first time the survey was sent there were a few people who had previously asked not to receive emails from SurveyMonkey® who were automatically removed from the recipient list online. The survey was initially sent to a total of 491 teachers. Twenty-seven email addresses bounced out the survey. Two weeks later the survey was sent to anyone who had not responded the first time, which totaled 350 teachers. This time two more teachers were unable to receive the email. A total of 172 completed or almost completed surveys were kept for analysis, yielding a 37 % return rate.

Variables

The dependent variable was whether teachers report feeling supported enough in using technology and if they felt trained well enough to use technology for instruction. The survey asked teachers a variety of questions regarding support from their schools in the form of money, time, and computer support. Other questions inquired about the teacher's training received both before and after graduating from college. The question was if there was a significant

relationship between sufficient support and training in technology, and the use of technology specifically to teach higher order thinking skills. The independent variable was whether the teachers were using technology to teach higher order thinking skills. Were there teachers who felt supported in using technology however they were not using technology?

Survey Instrument

The survey instrument, “Technology Survey for Family Consumer Sciences Teacher Educators,” was taken from K. Croxall’s dissertation work (2002). She created the survey and checked both the validity and the reliability of the instrument. The reliability was tested using Cronbach’s alpha, though the statistic was not reported. Croxall’s original instrument was used with teacher educators and their preparation of preservice teachers (Croxall, 2002). For the purpose of the current study, the survey was used with those who were already teaching high school. Therefore, some of the wording needed to be changed in order for the questions to apply (see Appendix C).

The survey was modified and parts of it were removed in order to focus on the higher order thinking skills and specific technology usage. Part A inquired how technology was incorporated into the teachers’ programs and what technology support they received from their schools. The teachers were also asked in which subjects they used technology and which hardware and software applications they used. Part B asked questions based on the International Society of Technology Education’s National Educational Technology Standards and Performance Indicators. A qualitative question was added which requested

teachers to provide a short description of a lesson plan that teaches or requires higher order thinking skills: analysis, synthesis, or evaluation. Part C of the survey asked demographic-type questions on the teachers' training in technology, their school, and themselves.

Data Analysis

The quantitative data gathered through the surveys was compiled and analyzed to discover if the satisfaction with support and technology training the family consumer sciences teachers had was proportionate to their use of technology to teach higher order thinking skills. It was noted how and what types of technology the teachers were using. The data collected from the survey was compiled in an Excel database, coded, and then analyzed using SPSS (Statistical Package for the Social Sciences) software and Excel.

The qualitative data was coded by course and by level of higher order thinking skill. The course categories were Foods/Culinary Arts, Child Care/Child Development, Consumer Education, Generic Lessons, Life Studies/Family Living, Fashion Design/Clothing Construction, Parenting, Interior Design, Fashion Merchandising, and Introduction to Teaching. A total of 77 out of 106 responses were used and further categorized by level or combination of levels of higher order thinking skills.

Objectives

The following research questions were addressed in the analysis:

1. Do family consumer sciences high school teachers feel sufficiently supported by their schools to use technology?

2. Do family consumer sciences high school teachers feel they receive enough training in technology?

3. How are family consumer sciences high school teachers using technology to teach higher order thinking skills?

CHAPTER 4: RESULTS

Introduction

The purpose of this study was twofold; to determine if family consumer sciences high school teachers feel sufficiency supported and trained to use technology and to find out if they are actually using technology to teach higher order thinking skills in their classrooms. Is there a connection between being trained and supported with technology and actually using it in one's classroom? It was hypothesized that family consumer science teachers do not receive enough support or training to teach technology skills. Subsequently, the null hypothesis was that teachers do obtain a sufficient amount of training and support at their schools in order to teach their students to use technology. A survey (See Appendix C) was emailed through SurveyMonkey® to all family consumer sciences teachers in the Northern Illinois Region in January 2009 with a response rate of 37%. This study was based on Croxall's (2002) study of preservice teachers and used a modified version of the instrument, Technology Survey for Family Consumer Sciences Teacher Educators. Examples of lesson plans teachers are implementing were collected and organized to be used as a reference for other teachers. Other comparisons were made between teacher's rating of their own computer skills with their confidence rating and teacher's age compared to their confidence rating and use of technology. Does having a greater number of teachers in a department increase the likelihood that teachers use technology to teach higher order thinking skills? Data related to the types of classes taught and software and hardware used was also compiled.

Quantitative Research

The ordinal data was first downloaded from SurveyMonkey® to Excel and then coded using a “4-point Likert scale” assigning a 4 to the “strongly-agree” responses, a 3 to the “agree” responses, a 2 to the “disagree” responses, and a 1 to the “strongly-disagree” responses (Croxall, 2002, p. 74). SPSS and Excel software was then used to analyze the data. Initially the main data studied were those questions that directly related to the research questions regarding teacher’s training and support in technology. Secondary survey questions were also coded and studied to determine their relationship to the independent and dependent variables.

The independent variable was whether the family consumer sciences teachers used technology resources to facilitate higher order thinking skills. This question was the last item from question eight on the survey. Teachers had the choice of answering “strongly-agree,” “agree,” “disagree,” “strongly-disagree,” or “don’t know.” No one answered “don’t know” so this question was coded the same as the dependent variable questions with a 1-4 scale. The dependent variable, whether teachers had enough technology support and training, was tested using question two: items one through four and item six (See Appendix C for the complete survey instrument). These questions asked if the teacher’s school provided sufficient financial support, training to use computers, planning time, computers, and if the teacher felt confident using technology. The variables and questions used were as follows:

How do you see computer technology fitting into your program?

- Dependent Variable 1: Financial Support, Question: My high school provides sufficient financial support for computer technology.

- Dependent Variable 2: Training, Question: My high school provides me the training I need so I can comfortably use computers and technology for teaching.

- Dependent Variable 3: Time, Question: My high school provides me enough time to plan to use computers and technology for teaching.

- Dependent Variable 4: Computers, Question: My high school provides me enough computers and sufficient technology for teaching.

- Dependent Variable 5: Teacher confidence in ability, Question: I am confident in my ability to teach/demonstrate computer skills in the classroom.

- Independent Variable 6: Use of technology to teach higher order thinking skills, Question: As a family consumer sciences teacher I: Use technology resources to facilitate higher order/complex thinking skills, including problem solving, critical thinking, informed decision-making, knowledge construction, and creativity

A summary of frequencies was calculated for each variable to note how often each response was chosen for each question. “Strongly-Agree” or “”Agree was chosen 87% in regards to financial support, 90% for training, 65% for time to plan to use technology, 72% for enough computers, and 87% in regards to teachers’ confidence in their ability. This is an average of 80% satisfaction between all dependent variables. (See Appendix D, Tables D1-6 for the Summary of Frequencies)

Next the means between the 6th or independent variable, teachers using technology to teach higher order thinking skills, and the 1st though 5th or dependent variables, kinds of support and training, were compared. This showed if teachers who said they did use technology to teach higher order thinking skills had a high level of support and training and level of comfort. Participants did not answer each question with the same answer across all variables showing the data to be reliable. The means for those who answered “strongly-agree” on their use of technology to teach higher order thinking skills were 3.53 for financial support, 3.38 for training, 3.04 for time to plan to use technology, 3.13 for computers, and 3.42 for teacher confidence level. For those who answered “agree,” the means were 3.24 for financial support, 3.26 for training, 2.79 for time, 2.91 for computers, and 3.13 for teacher confidence level. Teachers who choose “disagree” selected a mean of 2.73 for financial support, 2.93 for training, 2.43 for time, 2.60 for computers, and 3.00 for teacher confidence level. Finally those who choose “strongly-disagree” choose a mean of 2.00 on financial support, training, and time and a 3.00 on computers, and teacher confidence

level. There was only one “strongly-disagree” response when comparing each dependent variable with the independent variable. The data comparing the independent to the dependent variable is shown in Table 1.

When comparing the means of each variable to the other variables, there was a statistically significant difference in each case. Variable 1, financial support had a mean of 3.29, yielding a $t_{(1,167)}$=60.625 (p=.000). Variable 2, training, had a mean of 3.26, with a $t_{(1,167)}$=65.187 (p=.000). Variable 3, time to plan to use technology, had a mean of 2.83, with a $t_{(1,159)}$=50.987 (p=.000). Variable 4, enough computers and technology, had a mean of 2.96, yielding a $t_{(1,159)}$=47.238 (p=.000). Variable 5, teacher confidence in ability had a mean of 3.22, with a $t_{(1,165)}$=47.238 (p=.000). Finally, variable 6, use of technology to teach higher order thinking skills had a mean of 3.23, yielding a $t_{(1,164)}$=65.784 (p=.000). (See Table 2)

Table 1
Comparison Between Teachers' Level of Support and Training and Use of Technology to Teach Higher Order Thinking Skills

Variable 6 Use Technology (Tech) to Teach Higher Order Thinking Skills (HOTS)		Variable 1 Financial support	Variable 2 Training	Variable 3 Time	Variable 4 Computers	Variable 5 Teacher Confi-dence Level
1.00 "Strongly-Disagree"	Mean	2.0000	2.0000	2.0000	3.0000	3.0000
	N	1	1	1	1	1
	Std. Deviation	.	.	.	.	.
2.00 "Disagree"	Mean	2.7333	2.9333	2.4286	2.6000	3.0000
	N	15	15	14	15	15
	Std. Deviation	.7037	.5936	.5136	.5071	.7559
3.00 "Agree"	Mean	3.2447	3.2553	2.7912	2.9140	3.1304
	n	94	94	91	93	92
	Std. Deviation	.6829	.6211	.6586	.8554	.6988
4.00 "Strongly-Agree"	Mean	3.5273	3.3818	3.0392	3.1273	3.4182
	n	55	55	51	55	55
	Std. Deviation	.7054	.6429	.7057	.8166	.7005

Table 2
Means and t-test Between Financial Support, Training, Time, Computers, Teacher Confidence, and Use Of Technology (Tech) To Teach Higher Order Thinking Skills (HOTS)

	N	Mean	Std. Deviation
Variable 1: Financial Support	168	3.2917	.7037
Variable 2 Training	168	3.2560	.6474
Variable 3: Time	160	2.8313	.7024
Variable 4: Computers	167	2.9581	.8092
Variable 5: Confidence in Ability	166	3.2169	.6971
Variable 6: Use of Tech to Teach HOTS	165	3.2303	.6308
Student t-test for Equality of Means	Test Value = 0		
	t	Df	Sig. (2-tailed)
Variable 1 Financial Support	60.625	167	.000
Variable 2 Training	65.187	167	.000
Variable 3 Time	50.987	159	.000
Variable 4 Computers	47.238	166	.000
Variable 5 Confidence in Ability	59.451	165	.000
Variable 6 Use of Tech to teach HOTS	65.784	164	.000

Student *t*-tests were done to compare response answers to each other. First variable 6 responses, whether or not teachers used technology to teach higher order thinking skills, were compared to those teachers who chose "disagree," 2, and "strongly-agree," 4, on variables 1-5, feeling sufficiently trained and supported. Aside from the one response outlier on variable 4, having enough computers, results suggest that those with a higher level of training, support in terms of finances, time, and computers, and comfort level with using computers are more likely to use technology to teach higher order thinking skills. The means for financial support were 2.73 and 3.53, for "disagree" and "strongly-agree" respectively, yielding a $t_{(1,68)}$=*-4.200 (p=.000).* The means for training were 2.93 and 3.38, yielding a $t_{(1,68)}$=-2.430 (p=.019). For the variable time the means were 2.42 and 3.04, yielding a $t_{(1,63)}$=-2.782 (p=.007). The variable computers had mean values of 2.60 and 3.13, with a $t_{(1,68)}$=-2.431 (p=.018). Lastly, teacher confidence means were 3.00 and 3.42, with a $t_{(1,68)}$=-2.113 (p=.038). Results are shown on Table 3 as follows.

When comparing the choices "agree," 3, and "strongly-agree," 4, there was a significant difference on variables 1, 3, and 5, having enough financial support, enough planning time, and feeling confident in one's abilities to use computers. The means for financial support between "agree" and "strongly-agree" were 3.24 and 3.53, with a $t_{(1,147)}$=-2.502 (p=.013). The means for the variable time were 2.79 and 3.04, yielding a $t_{(1,140)}$=*-2.020 (p=.045).* For teacher confidence the means were 3.13 and 3.42, yielding a $t_{(1,145)}$=*-2.469 (p=.015).*

Therefore the people who answered “agree” were significantly different from the people who answered “strongly-agree.”

It was shown that an average of 57% of participants *agreed* that they had enough financial, training, time to plan, computers, and felt confident in the use of technology and *agreed* with an average score of 3.07 out of 4 that they were using technology to teach higher order thinking skills. Thirty-three percent of the sample *strongly-agreed* to their use of technology to teach higher order thinking skills though they only *agreed* with an average score of 3.3 on the dependent variables. In total 90% of participants *agreed* or *strongly-agreed* that they taught higher order thinking skills using technology and they *agreed* to being sufficiently trained and supported with a satisfactory teacher confidence level. A statistically significant difference was found for each variable in this comparison showing the data to be reliable. Therefore, the hypothesis was not supported and the null hypothesis failed to be rejected. See Table 4 for specific data.

Table 3
Mean and t-test: Use Of Technology (Tech) To Teach Higher Order Thinking Skills (HOTS) and Levels of Support and Training Between "Disagree" (2) and "Strongly-Agree" (4)

	Variable 6 Use Tech to Teach HOTS	N	Mean	Std. Deviation
Variable 1 Financial	2.00	15	2.7333	.7037
	4.00	55	3.5273	.6341
Variable 2 Training	2.00	15	2.9333	.5936
	4.00	55	3.3818	.6524
Variable 3 Time	2.00	14	2.4286	.5136
	4.00	51	3.0392	.7736
Variable 4 Computers	2.00	15	2.6000	.5071
	4.00	55	3.1273	.7948
Variable 5 Teacher Confidence	2.00	15	3.0000	.7559
	4.00	55	3.4182	.6580

(*table continues*)

Table 3 (*continued*)

Student t-test for Equality of Means			
	t	df	Sig. (2-tailed)
Variable 1 Financial	-4.200	68	.000
Variable 2 Training	-2.403	68	.019
Variable 3 Time	-2.782	63	.007
Variable 4 Computers	-2.431	68	.018
Variable 5 Teacher Confidence	-2.113	68	.038

Table 4
Mean and t-test: Use Of Technology (Tech) To Teach Higher Order Thinking Skills (HOTS) and Levels of Support and Training Between "Agree" (3) and "Strongly-Agree" (4)

	Variable 6: Use Tech to Teach HOTS	N	Mean	Std. Deviation
Variable 1 Financial	3.00	94	3.2447	.6829
	4.00	55	3.5273	.6341
Variable 2 Training	3.00	94	3.2553	.6211
	4.00	55	3.3818	.6524
Variable 3 Time	3.00	91	2.7912	.6586
	4.00	51	3.0392	.7736
Variable 4 Computers	3.00	93	2.9140	.8554
	4.00	55	3.1273	.7948
Variable 5 Teacher Confidence	3.00	92	3.1304	.6988
	4.00	55	3.4182	.6580

(*table continues*)

Table 4 (*continued*)

Student t-test for Equality of Means	*t*	df	Sig. (2-tailed)
Variable 1 Financial	-2.502	147	.013
Variable 2 Training	-1.178	147	.241
Variable 3 Time	-2.020	140	.045
Variable 4 Computers	-1.504	146	.135
Variable 5 Teacher Confidence	-2.469	145	.015

Finally, the responses “disagree,” 2, and “agree,” 3, were compared. This revealed no significant difference except in the case of variable 1, having enough financial support for computer technology. The means for financial support were 2.73 for “disagree” and 3.24 for “agree,” yielding $t_{(1,107)}$=-2.682 (p=.008). It was determined that people who chose “disagree” on items were different than those people who chose “agree” only in regards to variable 1, finances. Table 5 shows these results.

To determine other possible causes of differentiation between data, comparisons were done between a few other variables. The demographic interval data was also coded for comparison. Did those teachers who reported a high teacher confidence level with teaching computer skills also rate their personal computer skills at the same high level? This comparison was significant

with a mean of 3.31 for those answering “agree” and 3.97 for those answering “strongly-agree” yielding a $t_{(1,140)=}$ -7.745 (p= .000). (See Table D7) Results were also compared to determine if those teachers who rated their technology abilities high had knowledge of the International Society for Technology in Education standards. This did not prove to be significant. (See Table D8) Finally, one might think that teachers who did not grow up using computers would be less likely to use technology and therefore rate themselves at a low teacher confidence level. Did a teachers’ age affect their confidence in their ability to use technology? The age groups of 31-40 (3) and 41-50 (4) did not correlate to a particular ability score and this was found not to be significant. (See Table D9) On a comparison of the 21-30 year olds (2) to the 51-60 year olds (5) with the first set of standards questions however, the item, “use technology tools/information recourses to promote creativity” was significant with a mean of 3.34 for the younger teachers and a 3.05 for the older teachers with a $t_{(1,101)}$=2.567 (p=.012). (See Table D10)

Table 5
Mean and t-test: Use Of Technology (Tech) To Teach Higher Order Thinking Skills (HOTS) and Levels of Support and Training Between "Disagree" (2) and "Agree" (3)

	Variable 6: Use Tech to Teach HOTS	N	Mean	Std. Deviation
Variable 1 Financial	2.00	15	2.7333	.7037
	3.00	94	3.2447	.6829
Variable 2 Training	2.00	15	2.9333	.5936
	3.00	94	3.2553	.6211
Variable 3 Time	2.00	14	2.4286	.5136
	3.00	91	2.7912	.6586
Variable 4 Computers	2.00	15	2.6000	.5071
	3.00	93	2.9140	.8554
Variable 5 Teacher Confidence	2.00	15	3.0000	.7559
	3.00	92	3.1304	.6988

(*table continues*)

Table 5 (*continued*)

Student t-test for Equality of Means	*t*	df	Sig. (2-tailed)
Variable 1 Financial	-2.682	107	.008
Variable 2 Training	-1.875	107	.063
Variable 3 Time	-1.967	103	.052
Variable 4 Computers	-1.380	106	.171
Variable 5 Teacher Confidence	-.663	105	.509

Other Reported Data

The majority of teachers reported their computer skills to be average/adequate (49.1%) or advanced (42.7%). Participants were asked in which classes computer technology is modeled by the teacher and/or required of the students. Courses where computer technology is reported by over 50% of teachers as both modeled and required were Child Development, Consumerism and Finance, and Foods and Nutrition. The highest percentage of student requirement of technology in a course was in Child Development at 68% of responses and the highest percentage of technology modeled by teachers was in Foods and Nutrition at 71%. (See Table D11)

In terms of electronic technology modeled by teachers and/or required by students, teachers were asked about the following items: digital cameras, scanners, simulator babies, computerized sewing machines, smart boards, and game show clickers. The number one technology modeled by teachers were digital cameras (73%) followed by simulator babies (56%). Students, on the other hand, are foremost required to use the simulator babies (73%) and then computerized sewing machines (42%). Fifty-eight percent of teachers did not have a smart board available for them to use and 48% did not have game show clickers/audio response systems. (See Table D12)

The third question which asked family consumer sciences teachers to choose if an item was modeled by the teachers and/or required by the students, was about specific software use. Word-Processing, Desktop Publishing, Spreadsheets, Databases, Presentation software, Hypermedia software, Web Design, and Blogs were the choices, with teachers having the option to write in the name of programs not listed. The following applications were reported as modeled by over 50% of teachers, Word-Processing, Desktop Publishing, Presentation Software, and Hypermedia software. Students were expected to use Word-Processing software by 90% of teachers, Presentation software by 74% of teachers, and Hypermedia software by 71% of teachers. (See Table D13) A *t*-test was then done to compare teachers' rating of their ability and whether an application was modeled by teachers (2) or both modeled by teachers and required of students (4). The results for both Desktop Publishing and Power Point were significant. Desktop Publishing had a mean of 2.18 for the choice of 2 and

2.89 for the choice of 4 yielding a $t_{(1,72)=}$-2.067 (p=.042). In the case of Power Point, the means were 3.00 and 3.51 respectively with a $t_{(1,77)}$=-2.090 (p=.040). (See Table D14)

A portion of the survey asked questions regarding the International Society for Technology in Education's National Educational Technology Standards and Performance Indicators for Teachers. Only 15% of teachers said they were familiar with the standards although 52% said they were somewhat familiar with the standards. The other questions looked at how teachers are specifically using technology in their classrooms. The independent variable, whether teachers use technology to facilitate higher order thinking skills, was in this set of survey questions. This particular question was discussed as it related to the research questions. Overall, when reviewing the standards questions, over 50% of teachers reported *agreeing* or *strongly-agreeing* with every statement. (See Table D15) Specific items in this portion will be evaluated and compared in further research at another time.

Teachers were asked a few demographic-type questions about their programs, training, schools, and themselves. There were a wide range of courses taught by the family consumer sciences teachers who participated in this study. Seventy-one percent of participants teach Foods and Nutrition courses, 46% teacher Child Development courses, 29% teach Consumerism and Finance, 27% teach Apparel and Textiles, 19% teach Family Living, and 18% teach Interior Design. These figures overlap as many teachers teach more than one subject. Another 45 respondents wrote the names of one to three courses under

the “other(s) please specify” section. Some of these courses listed, such as Fashions I and II, or Child Development Workshop could have been listed in one of the given categories. Participants, for some reason, did not feel comfortable categorizing their course into one of the general categories. Further research might be done next time to determine more precise category names or the wording could have been changed to accommodate a wider range of classes.

A few questions focused on the teachers’ technology training. When asked if participants were required to take a technology course prior to graduating from college, less than 50% said yes (47%). The next question followed by asking teachers if they had taken technology related classes, workshops, seminars, or online sessions since becoming a teacher. Overwhelmingly this response was yes with 88%. Thirty-five percent of participants reported taking one to two classes, workshops, etc., 42%, the majority, have taken three to five classes, and 23% have taken six or more.

Lastly, teachers were asked about their schools and their age. As expected most of the participants reported teaching in a suburban school (94%) with 5% and 1% teaching in rural and city schools respectively. Most of the teachers in this survey have other family consumer sciences teachers in their departments. There were 28% who have two to three people, 48% who have four to five teachers, and 20% who have six or more teachers. Regarding the number of students in participant’s schools, the majority of respondents, 45%, have 1,000 to 3,000 students. Teachers were asked about the amount of budget money their department receives. Fifty percent of respondents chose “do not know or do not

wish to share." One could assume that teachers did not wish to share and that they do know how much budget money their department has but as the question was not separated, it is unclear. According to those who answered with a monetary figure, 38% had over $3,000. A few teachers commented through email that they felt lucky because their department was given much more than $3,000. "The budget question made me realize that my budget is so much larger than your survey's question. I guess I'm really lucky" (C. Mack, personal communication, January 12, 2009). Another teacher suggested that the scale could have been raised. This was a delicate question and in the future, more research would need to be done if the question was to be pursued. Finally, the last question asked teachers their age range. This data, as described above was compared with the independent and dependent variables. Forty percent of teachers who participated were 21-30 years old, 16% were 31-40 years old, 14% were 41-50 years old, 26% were 51-60 years old, and 4% were 61 year of age or older. It would be interesting to know the ages of teachers who opted not to participate in the survey and study if a combination of age and/or confidence in computer skills was a factor in those who did not choose to participate in this survey.

Research Question 1

The first research question was: Do family consumer sciences high school teachers feel sufficiently supported by their schools to use technology? This question was specifically tested by variables 1, 3, and 4, which asked about financial support, having enough time to plan to use technology, and having

enough technology itself to use. For all three questions, the majority of teachers said they agreed with the statement at 44%, 52%, and 44% respectively. One could conclude that family consumer sciences teachers are on average satisfied with the technology support they receive from their schools.

Research Question 2

The second research question was: Do family consumer sciences high school teachers feel they receive enough training in technology to instruct their students through the use of technology? This question was tested using variables 2 and 5, which asked teachers if they received enough training to use technology (2) and if they felt confident in their computer abilities (5). As with the first research question, teachers responded with a majority of agree replies at 54% (variable 2) and 50% (variable 5). In general then, teachers reported having enough technology training and feeling self-assured enough to use this technology.

The overall question that summarized the variables was the independent variable question, number 6, where teachers were asked if they were using technology to teach higher order thinking skills in their classrooms. The majority of teachers, 56%, *agreed* and 33% more stated they *strongly-agreed*. Therefore, teachers do feel they are using technology to teach higher order thinking skills in family consumer sciences classrooms. When combined, it was determined that an average of 89% of respondents reported both having sufficient levels of support (financial, time to plan, and computers) training, and teacher confidence level and are teaching higher order thinking skills using technological methods.

Qualitative Research

Research Question 3

Participants were asked one open-ended question in this study. The question asked them: “In a few sentences describe your best lesson where your students use higher order thinking skills (analysis, synthesis, and/or evaluation).” They were told not to focus on which skill the lesson used but to state the name of the class and give a brief description of the lesson. One hundred and six responses were written but only 77 were included in this study. Responses were not used if the lesson plan did not relate to technology, family consumer sciences, or it did not demonstrate a higher order thinking skill. A few of the lessons plans were almost identical in content and so were not included.

The lesson plans were coded according to the course the teacher mentioned or inferred and by the level(s) of higher order thinking skills the lesson entailed. There were 26 Foods/Culinary Arts lesson plans, 15 examples of Child Care /Child Development activities, 14 from Consumer Education, 6 that were Generic Lessons as they were not course specific but could be used in any class, 4 from Life Studies/Family Living, 4 lessons from Fashion Design/Clothing Construction, 3 Parenting lessons, 3 Interior Design examples, and 1 each from Fashion Merchandising, and Introduction to Teaching. A sample of the various lesson plans are presented here. For the complete list of all 77 lessons, see Appendix E.

Lessons by Course

Foods/Culinary Art

Foods and Culinary Arts classes teach about food preparation, nutrition, safety and sanitation in the kitchen, commercial food kitchens, and running a restaurant. Examples of Foods lesson plans are as follows.

- “Service Learning project requires students in Foods classes to research nutritional needs and problems of seniors. The students are then responsible to plan a nutritious snack that can be served at a nursing home facility that will meet nutritional needs as well as identify any special nutritional needs of some inhabitants.”
- “Professional Foods: We used a nutrition calculator program to analyze and advise outside adult "clients" to promote healthier living. The students were able to input and use data analyses to draw conclusions and draw up recommendations for their clients.”
- “Creative Cooking 1 The USDA website for nutrition analysis. Students record what they ate for 2 or 3 days then enter it into the USDA My[Pyramid] website, after which they analyze and evaluate their consumptions.”
- “Health Occupations class - students use the smartboard to design fliers promoting handwashing at school - incorporate data/facts (such as % of high school students who wash their hands after using the washroom), attention getter, [information] source. We print the fliers & students post the fliers after strategizing the most effective placement”

Child Care/Child Development

Child Care or Child Development courses include the study of how children develop, how to teach and run a preschool, child safety, and guidance of children. The following are a few examples of lessons.

- “Child Development, the students have to design their own child care facility using Word, scanners, PowerPoint, Publisher, all of [Microsoft] office, and digital cameras and video. Also provide a bi-[weekly] newsletter for the parents using the same technology tools.”
- “Students create a lesson plan for a specific [curricular] area to teach three and four-year-old preschoolers. Students must use at least 3 resources (can be internet sites) to create their lesson. Students evaluate the age-appropriateness and practicality of the lesson plan ideas when creating their own lessons.”
- “Child Care: Baby Think It Over Simulator -Students will use the BTIO software (sheet produced by teacher) to analyze the percentage data. They will find the averages, medians, modes, range, as well as the incorporation of graphs. This will help students determine their position, based on care percentage, out of all the students taking home the infant simulator.”
- “My students in my preschool lab create a case study power point presentation on a particular child. The students evaluate the child's different areas of development and compile the information into a presentation which they then present in a parent conference.”

Consumer Education

Consumer Education is a course required by Illinois law, that all students must take. It teaches practical knowledge such as buying a house/renting an apartment, laundry, checkbooks, credit cards, loans, nutrition, savings options, etc. The following are lessons from these classes.

- “Consumer Education budget unit They use the computer to present their project with a power point. They research using [websites] for housing, cars, renter's insurance, budget packages, comparison food prices, clothing, etc. The students develop interactive activities for the class when they teach it. Their tests are done on the computer and put in a dropbox.”
- “Consumer Education, Students used the Internet to find information about potential automobiles they would like to buy. They then analyzed which car they could afford, why it would be good for them, and how they could lower the price. It was then put into a PowerPoint presentation and shown to the class.”
- “Consumers Education: selection of housing in the area they need to calculate and figure cost to purchase a mortgage, they need to select financial institutions in the area and compare them with reference to point, interest rates, down payments, difference in rates according to length of the term. They then need to present a Power Point presentation.”

Generic Lessons

Lessons placed in this category were not course specific. They were applicable to a variety of family consumer sciences related courses.

- “Child Development & Culinary Arts & ProStart -Have used this lesson in several classes. Good intro to any unit. Usually done with vocabulary but can be used for any key concepts. Child Development: Prenatal Terms, Culinary Arts: Utensils/Culinary Terms, ProStart: Foodservice Equipment. Take students to computer lab. The day before each student signs up for a different vocabulary word for the unit. In the computer lab the students look up their word, its definition, and a picture of the word. They put that together on a PowerPoint slide. All the students save their slide to my flashdrive and I put their words in order to [complete] the presentation. The next day in the classroom, we have a PowerPoint presentation and they get to explain their word to the class. The only thing the teacher does is come up with what words/concepts they want learned and make the title slide. Notes/Vocab=Done”
- “For my classes the best lessons that use higher order thinking skills [would] be those which the students gather information and put it together into a presentation and teach others. Teaching is the best way to learn and having to go out and find their own information using technology amplifies this learning.”

Life Studies/Family Living

These courses may teach about marriage, living on your own, or subjects similar to consumer education. Sometimes the classes count for Consumer Education credit.

- “In the Sociology of Marriage and Family course, students must utilize information about birth order, heredity, family structure, and personality characteristics to create a "Future Family Portfolio.” The students must utilize the internet as well as the course textbook to complete various portions of the project. Students must create their 'future family' and explain if they want children, why or why not, how many, and how they will raise them based off their experiences growing up. They must also include what type of family they are a part of. They must also describe the role that they have in their family and what role they feel they will have in their future family.”
- “Class: HERO Cooperative Education Students choose from four articles and write/type a summary into Microsoft Word - upon completion they check the reading grade level - then return to their summary and utilize synonyms, revise incomplete sentences, combine sentences utilizing transitions - then recheck the reading grade level - revise as many times as they want within a given class period. Goal is to increase their writing ability. I also like using a wide range of tools in Microsoft Word or Publisher to create an ad for their place of business.”

Fashion Design/Clothing Construction

These hands-on classes teach students to sew and design clothing and craft projects. Students may also use computerized sewing machines, surgers, and pattern-making software.

- “Advanced Fashion - Computerized pattern-making Students must design a garment, take their measurements, and use the information to take standard slopers and transform them into a pattern for their original design. They use Cochenille Design Studio's "Garment Designer" software, along with the reference and design manual. Students then construct the garment and finally, evaluate how well the final product matches the original design.”
- “Introduction to Fashion: They create a Professional Career Image Portfolio using the computer. Given a budget and a job that has specific dress code rules, they must create five outfits using the elements and principles of design to their body and stay within their budget. They more or less go fake shopping for these wardrobes noting the supplier and cost of each item. This project is also used in FCCLA competitions.”

Parenting

Parenting classes discuss marriage, family planning, prenatal development, labor, and delivery, as well as nutrition for a pregnant mother.

- “Child Development and Parenting: The students had to research certain STDS on websites that were provided. They had to research in

groups with each assigned to a specific task. Once they were finished, they had to create a PowerPoint, save it to a shared drive and then present it. It is a great project and I have been doing this one for 3 years."

- "Parenting: Students take Baby-Think-It-Over home and care for it for 3 days and 2 nights. They must type summary of events that took place, reflect on their experience, and decide if they are ready to parent."

Interior Design

In Interior Design class students learn about color, lighting, space, measuring, floor plans, etc.

- "Students are required to use the World Wide Web to research different housing styles and where they originated from. This is for Interior Design."
- "Interior Design students select one of 3 homes. They draft the home and interior rooms to meet the needs of their family. They peer and teacher review to solve problem areas. They search the web for furniture and decorating samples and organize the information into a Word chart. They present the drafts and room by room decorating into a binder presentation for their final exam project."

Fashion Merchandising

Fashion merchandising teaches about the business part of the fashion industry such as buying clothes and selling to vendors.

- “This lesson is in my highest level of Fashion - Students are required to create a url with [their portfolio] pictures for others to view and manipulate garments rotation. They are also required to do a cost analysis of [their] garments and what it would cost for the average consumer to buy. Much research, creativity, and time are devoted to this large undertaking.”

Introduction to Teaching

Some schools offer a class to prepare students to teach and even allow them to have actual experience teaching children in an elementary school.

- “At the end of first semester in Introduction to Teaching the students prepare and present a lesson on a topic related to the field of education. The students are graded on the mechanics of the lesson which includes format, topic, use of technology, and presentation.”

Lessons by Higher Order Thinking Skills

Lessons were also categorized according to the level(s) of higher order thinking skill(s) they used. To be included in the analysis area the lesson had to demonstrate the use of comparing and contrasting ideas, relating one concept to another, or proving a theory (Huitt, 2004). The act of synthesizing comprises designing a project or presentation, creating or combining ideas, or hypothesizing a proposal (Huitt, 2004). Huitt (2004) explains that evaluation consists of students judging or critiquing work, having to justify their answers, or use standards such as a rubric to assess information. Lesson plans were given that demonstrated each of the levels of higher order thinking skills as well as

combinations of two or even all three levels. There were 17 lessons that used solely analysis, 26 that utilized synthesis, and 7 that used evaluation. The rest of the lessons used a combination of higher order thinking skills.

Analysis

An analysis lesson plan may require students to gather data and decipher the meaning of the information. Examples of these lessons follow.

- “Life Studies: Students analyze their diets using a web program. It shows them their caloric intake, nutritive values and everything they need to know about foods they consume. They then take what they learn and write a paper using the web as their resource.”
- “In Practicum in Early Childhood Education, I created a webquest where students are given the assignment of a substitute preschool teacher. They have to find 3 activities on the web that deal with 3 different curriculum areas and are about a specific theme.”
- “Advanced Foods-Yeast experiments. Students need to analyze the reaction between yeast and several other ingredients. They must then decide which ingredients are necessary for the proper functioning of yeast.”

Synthesis

Students using information to create a presentation and a related class activity would require the skill of synthesis. These are some of the submitted lesson plans.

- “Child Development and Parenting: The students had to research certain STDS on websites that were provided. They had to research in groups with each assigned to a specific task. Once they were finished, they had to create a PowerPoint, save it to a shared drive and then present it. It is a great project and I have been doing this one for 3 years.”
- “Service Learning project requires students in Foods classes to research nutritional needs and problems of seniors. The students are then responsible to plan a nutritious snack that can be served at a nursing home facility that will meet nutritional needs as well as identify any special nutritional needs of some inhabitants.”
- “Foods I: Students create a brochure, including 5 safety procedures, that can be use[d] in home food preparation or within the food service industry.”

Evaluation

When students must explain why they are taking a certain action or the reasoning behind their answer, they are using evaluation. The following lesson plans require the skill of evaluation.

- “Parenting: Students take Baby-Think-It-Over home and care for it for 3 days and 2 nights. They must type [a] summary of events that took place, reflect on their experience, and decide if they are ready to parent.”

- “Consumer Education. We evaluate different rental homes and homes to purchase. The students look at their needs and wants and evaluate what would be a good rental unit.”

Analysis, Synthesis, and Evaluation

These lesson plans included all three levels of Bloom’s taxonomy.

- “Advanced Fashion - Computerized pattern-making Students must design a garment, take their measurements, and use the information to take standard slopers and transform them into a pattern for their original design. They use Cochenille Design Studio's "Garment Designer" software, along with the reference and design manual. Students then construct the garment and finally, evaluate how well the final product matches the original design.”
- “Real World Project: Students are required to "rent" an apartment, "buy" a car, "furnish" their apartment, and "buy" appropriate interview attire all within the starting salary budget that came from a previous career project. The project forces them to make decisions about what is important to them and what they are willing to live without. Students are forced to analyze their own values and goals.”

Synthesis and Evaluation

Examples of lesson where students need to use both synthesis and evaluation follow.

- “Students create a lesson plan for a specific curricular area to teach three and four-year-old preschoolers. Students must use at least 3

resources (can be internet sites) to create their lesson. Students evaluate the age-appropriateness and practicality of the lesson plan ideas when creating their own lessons."

- "The students do a comparison shopping project. They compare 3 things and are required to use the internet to do research. They are also required to use epinions or those types of sites to gather information. They then make an informed choice. This is all typed and turned in."

Analysis and Synthesis

A few lessons required the combination of analysis and synthesis.

- "Consumers Education: selection of housing in the area they need to calculate and figure cost to purchase a mortgage they need to select financial institutions in the area and compare them with reference to point, interest rates, down payments, difference in rates according to length of the term. They then need to present a Power Point presentation"

- "In the Sociology of Marriage and Family course, students must utilize information about birth order, heredity, family structure, and personality characteristics to create a "Future Family Portfolio." The students must utilize the internet as well as the course textbook to complete various portions of the project. Students must create their 'future family' and explain if they want children, why or why not, how many, and how they will raise them based off their experiences growing up. They must also

include what type of family they are a part of. They must also describe the role that they have in their family and what role they feel they will have in their future family."

- "Interior Design: Students select one of 3 homes. They draft the home and interior rooms to meet the needs of their family. They peer and teacher review to solve problem areas. They search the web for furniture and decorating samples and organize the information into a Word chart. They present the drafts and room by room decorating into a binder presentation for their final exam project."

Analysis and Evaluation

Finally, there were lesson plans that necessitated the skills of analysis and evaluation.

- "Child Development: To Spank, Or Not To Spank? Students are asked to take a stance on the controversial topic of spanking and defend their position. They are required to research and obtain credible information. Our media center specialist provides support and assistance during computer lab time."

- "Professional Foods: We used a nutrition calculator program to analyze and advise outside adult "clients" to promote healthier living. The students were able to input and use data analyses to draw conclusions and draw up recommendations for their clients."

- “Creative Cooking 1: The USDA website for nutrition analysis. Students record what they ate for 2 or 3 days then enter it into the USDA MyPyamid website, after which they analyze and evaluate their consumptions.”

Results

Family consumer sciences high school teachers are using technology to teach and are requiring their students to learn through higher order thinking skills. Some teachers even used the words analyze, synthesize, and/or evaluate when describing their lessons. Clearly, they understand what each level entails. There were multiple lessons that did not fall neatly into one higher order thinking skill category or another. Instead, some lessons used two or all three skills. A few lessons were not course specific and could be generalized to other disciplines.

Although the question did not specifically ask for the use of technology, the majority of teachers did include technology in their lessons. Out of the 106 responses, 77 were useful in terms of giving details on how technology and higher order thinking skills were combined in a family consumer sciences lesson plan. Some teachers may have not wanted to take the time to write out a lesson plan or perhaps could not choose one out of the many they teach. One teacher said, “Our …[department] is growing so much that we have not had the time to use technology in our classroom.” This was interesting as one might assume that technology was an integral part of any modern classroom. Apparently, this teacher felt it took too much time to incorporate and plan for the use of technology. Additional research on the reasoning behind comments such as

these would be valuable as a means to encourage teachers and help them become less overwhelmed in their daily planning.

Summary of Findings

The findings failed to reject the hypothesis because it was shown that the majority of family consumer sciences teachers did have enough support and training to use technology in their classrooms. Teachers also felt they were using technology to teach higher order thinking skills. The hypothesis was that teachers would not feel they received sufficient support and training from their schools in technology. A discussion of the importance of these findings and how they compare to results from other studies follows, as well as applications of the current study and recommendations for future studies based on the research.

CHAPTER 5: DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

Research on the opinion of family consumer sciences teachers is lacking. This study was conducted to fill the void of knowledge on how technology is being used to teach higher order thinking skills. Specifically, this study discovered if family consumer sciences teachers receive enough financial support, training, time to plan for technology usage, and computers to use technology for teaching. Data on family consumer sciences teachers' confidence in their ability to use technology and how this correlates to their actual practice was also collected. What factors contribute to teachers' confidence and/or ability with technology? Qualitative research provided actual lesson plans that demonstrate the combination of technology and higher order thinking skills. These lesson plans were categorized by course and by level of higher order thinking skill. The findings will be shared in comparison to research by others in the field. This data has positive implications for both teachers and administrators. It also provides a stepping-stone for further research in this field.

Methodology

The design of this research was based on Dr. Croxall's (2002) study on teacher educator's preparation of family consumer sciences preservice teachers, or those training to be teachers. Croxall found that teacher educators do expect preservice teachers to use technology in the classroom (2002). A modified version of Croxall's instrument, Technology Survey for Family Consumer Sciences Teacher Educators, was used with a qualitative question added.

Family consumer sciences high school teachers from the Northern Illinois Region were identified based on individual school web site data and phone calls to the schools. A total of 501 participants were found and their emails were listed. Each teacher was emailed a cover letter with a link to a survey on SurveyMonkey®. The cover letter briefly explained the purpose of the research and asked for participation. A few people had previously denied SurveyMonkey® communication and other's email did accept correspondence. There were 172 surveys partially or completely returned out of the 462 that could be sent giving a 37% return rate.

The data was then coded and compared using SPSS and Excel software. Frequency charts, and *t*-tests were run on the data to gather the final results. Lesson plans from the qualitative question were categorized by the type of class and type of higher order thinking skill students were required to use.

Discussion of Findings

Family consumer sciences teachers were surveyed about their level of support in terms of money, time to plan, and computers, and their training and teacher confidence level in relation to technology. In all cases, over half of participants *strongly-agreed* or *agreed* that they did receive enough support or training. As far as financial support, 87% were satisfied, for training, 90%, for time, 65%, and in regards to enough computers and other technology, 72% were content. When asked about their confidence in their ability to teach or demonstrate computer skills in the classroom, 87% of teachers either *strongly-agreed* or *agreed*. In general, therefore, teachers do appear to receive adequate

support and training, although they could use more planning time for the use of technology. The majority, 96%, reported their computer skills to be from average to very advanced. There was a significant correlation between teacher's confidence with their ability to use technology in the classroom and their self-reported skill level. How these skills relate to use in the classroom was studied next.

The frequency of use of technology in various family consumer sciences course was noted in terms of which classes it was modeled by the teachers and/or required of the students. Child Development, Consumerism and Finance, Foods and Nutrition, and Interior Design classes were reported by over 50% of participants as both having technology modeled by the teacher and being required of students. As far as specific hardware technology used in family consumer sciences classes, digital cameras and simulator babies were modeled by over 50% of teachers. Simulator babies, which require pretend feeding, changing, rocking, and burping, were the only technology reported being required by over 50% of students. Computers were not included in the list of possible technologies because it was presumed that students are in general expected to use computers. This may however be an item to include if this study were repeated. In terms of software, teachers modeled word-processing, desktop publishing, spreadsheet, presentation software, and hypermedia software in over 50% of responses while students are required to use word processing, presentation, and hypermedia software (Word Wide Web searching) at least in 50% of teacher's classes. In the cases of Desktop Publishing and Power Point,

teachers' rating of their own ability to use technology was significantly related to them requiring their students to use these programs. In other words if teachers do not feel comfortable using a particular software, they do not expect their students to use that software either.

The next set of questions related to family consumer sciences teachers observance of the International Society for Technology in Education's National Educational Technology Standards and Performance Indicators for Teachers. Only 15% reported being familiar with the standards, although 52% said they were somewhat familiar with them. The focus of this section was if teachers reported actually using technology to teach higher order thinking skills and then comparing this response to those regarding amount of support and training. In total 90% of teachers *strongly-agreed* or *agreed* that they did in fact use technology to teach higher order thinking skills and they had enough support and training. Familiarity with the standards however, was not significantly related to one's teacher confidence level in using technology in the classroom. Only 44% of the total participants though choose to submit an actual lesson plan. Questions regarding teacher's educational training, school, department, and their age were included at the end of the survey. Most of the teachers instruct in a suburban school and have more than one family consumer sciences teacher in their department. Half of the participants either did not know or did not wish to share how much budget money they received. Out of all the participants, the majority in one age group was from ages 21-30. This age group agreed or *strongly-agreed* that they "used technology tools/information resources to promote creativity"

significantly more than the 51-60 age group. It was shown that confidence in one's ability is related to usage of particular software in the classroom. Therefore, family consumer sciences teachers may need to be taught to use a variety of applications to encourage their use by students and teachers in the classroom.

Overall Conclusions Based on Research Questions and Hypothesis

Research Question 1

The first research question asked was if teachers felt they received enough support from their school in the use of technology. This was tested by asking three questions on the survey regarding financial support, time, and computers. Eighty-seven percent of teachers reported having enough financial support for computer technology. Only 65% of teachers said they had enough time to plan to use computers and technology for teaching. In regards to actual computers and other technology, 72% of participants responded being satisfied with the amount they had. Overall, family consumer sciences teachers in the Northern Illinois region did report having enough support from their schools.

Research Question 2

Second, this study asked if teachers felt they received enough training in technology to instruct their students in the use of technology. This research question was tested using two survey items. The first item asked if the teacher's high school provided the training they need to use computers and technology for teaching. Participants responded with a 90% positive rating. Next teachers were asked about their confidence in their ability to teach/demonstrate computer skills in the classroom. The results were similar with an 87% positive response rate.

Family consumer sciences teachers therefore do feel they get sufficient training from their schools in regards to technology.

Research Question 3

The third research question was a qualitative open-ended question that asked how teachers are using technology to teach higher order thinking skills. Teachers were asked to submit a lesson plan where higher order thinking skills was used. Although there were 106 responses, only 77 were included in this study. Not all lessons were related to technology and others were duplicates. The lessons were categorized by course and by level(s) of higher order thinking skill(s). Courses included, in order of those with the most lesson plans, were Foods/Culinary Arts, Child Care /Child Development, Consumer Education, Generic Lessons, Life Studies/Family Living, Fashion Design/Clothing Construction, Parenting, Interior Design, Fashion Merchandising, and Introduction to Teaching. The levels and combinations of higher order thinking skills were Analysis; Synthesis; Evaluation; Analysis, Synthesis, and Evaluation; Synthesis and Evaluation; Analysis and Synthesis; and Analysis and Evaluation. See Appendix E for a complete listing of all 77 lesson plans.

Hypothesis

The hypothesis of this study, that family consumer sciences high school teachers do not feel sufficiently supported by their schools to use technology and do not feel they receive enough training in technology to instruct their students through the use of technology, was not supported. Based on the results of the administered survey, an average of 80% of teachers reported that they did have

enough support and training in the area of technology. Therefore the null hypothesis, that teachers feel sufficiently supported and trained as far as technology, failed to be rejected.

Comparison to Literature Review

Technology

With the rising trend of online education and most business using computers to operate, it is vital for students to learn multiple uses of technology (Voogt & Pelgrum, 2005). This study showed that 89% of family consumer sciences teachers from five counties are currently well-versed in using technology. These teachers are also teaching higher order thinking skills using this technology. Students taking a family consumer sciences class are therefore likely to learn technology skills, which will help them in their futures. Lesson plans that use technology might include researching information online or inputting data into a software program (ChanLin, 2008). An example of this is this teacher's lesson,

> "Child Development and Parenting, The students had to research certain STDS on websites that were provided. They had to research in groups with each assigned to a specific task. Once they were finished they had to create a PowerPoint, save it to a shared drive and then present it . . ."

Authenticity in class assignments is the key to student excitement and participation (Young, 2008). This is easily done in family consumer sciences classes that focus on caring for a child, designing a house, cooking dinner, following a budget, or sewing a button. Lessons with real-life applications were found from this study's participants just as they were in other subject areas (NEA

Today, 1999). For example, the following assignment may encourage a student to be a dietician.

> “In my advanced foods class, students expand their understanding of nutrition by acting as a nutrition counselor for an adult (of their choosing). They use MyPyramidtracker.gov to analyze information provided by their "client" and then evaluate the printouts. They use a variety of higher order thinking skills and additional research to develop a meaningful report which they word process for their client.”

Does technology give cause for the teacher to lose her/his place as the instructor? Perhaps technology could become the new teacher. In answer to this question, Astleitner (2002) discusses the positive aspects of letting students learn through the computer. The most important part of an activity is the teacher who works with their students on evaluating the lesson (Astleitner, 2002). Evaluation is Bloom’s highest level of thinking on his taxonomy of skills. Therefore, no matter what information students learn though technology, it is making the connection to something authentic and being able to apply and evaluate what they have learned that is vital. That is where the teacher’s role comes in. Similar to Labbo’s (2006) findings, one teacher did mention that her department had no time to incorporate technology into their lessons. It would be of value to discuss with this teacher why she/he feels that incorporating technology into one’s lessons takes a lot of time. Does this teacher just need some suggestions or are they unfamiliar with technology? In this study, although the majority, only 65% of participants reported having enough time provided to use technology. Clearly, this issue needs to be looked at in more detail as will be discussed further. As far as feeling confident with using computers and technology, 87% answered positively.

Teaching though blogs, wikis, or using YouTube is a new trend used in some classes (Kupetz, 2008). There was only one lesson plan submitted that mentioned using blogs and none that mentioned wikis or YouTube. This may be because teachers are only beginning to learn of the potential for using online communication and video or because some schools do not support this technology (Levin & Wadmany, 2008). Other schools have web servers that block these types of web sites.

Blocked web sites are one problem that limits technology usage in schools. Another often-reported issue is the limited knowledge on integrating computers within a teacher's lessons (Espinosa & Chen, 1996). The present study helped to solve this problem by collating the 77 family consumer sciences lesson plans, which combine technology and higher order thinking skills and posting them online. A web site was created that lists the lesson plans by both course and by higher order thinking skill. (See Appendix F) The web site address was emailed to the participants of this study and they were encouraged to share the site with other teachers.

A few questions were asked of participants about their training in technology. Although in Illinois, teachers are required to take a Technology for Teachers course, only 47%, or about half of respondents reported taking any technology prior to graduating college. One might think the low number was because of the age of the teachers but in fact, the majority, 40%, said they were between the ages of 21-30. Most of the teachers, 88%, said they have taken a technology related class, workshop, seminar, or online session since becoming a

teacher. This is a positive finding, that teachers are continuing to learn the latest information about technology, a rapidly changing field.

International Society for Technology in Education

Technology standards were created for both teachers and students. They were written by the National Council for Accreditation of Teacher Education and the International Society for Technology in Education. When asked if they were aware of the standards, only 15% of this current study's participants replied yes, although 52% said they were somewhat familiar with the standards. The standards ask teachers to assist students to use higher order thinking skills to complete various tasks. For example the first standard states, "Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology…" (International Society for Technology in Education, 2008b). An example of this type of lesson was contributed by a participant and follows.

> "Advanced Fashion - Computerized pattern-making Students must design a garment, take their measurements and use the information to take standard slopers and transform them into a pattern for their original design. They use Cochenille Design Studio's "Garment Designer" software, along with the reference and design manual. Students then construct the garment and finally, evaluate how well the final product matches the original design."

Another one of the standards asks students to "apply digital tools to gather, evaluate, and use information…" (International Society for Technology in Education, 2008b). This is accomplished by these related lesson plans from child development and parenting classes.

- “Students take Baby-Think-It-Over home and care for it for 3 days and 2 nights. They must type summary of events that took place, reflect on their experience, and decide if they are ready to parent.”
- “Baby Think It Over Simulator -Students will use the BTIO software (sheet produced by teacher) to analyze the percentage data. They will find the averages, medians, modes range, as well as the incorporation of graphs. This will help students determine their position, based on care percentage, out of all the students taking home the infant simulator.”

Although not many teachers reported being entirely familiar with the International Society for Technology in Education standards, many of them provided lesson plans, which reflected these standards. It would be helpful though to make the standards more well-known so that all teachers might be aware of them as they plan their lessons.

Higher Order Thinking Skills

Benjamin Bloom designed a hierarchy of levels of knowledge, with which most educators are familiar. The top three levels out of the six are labeled higher order thinking skills. These top levels are analysis, synthesis, and evaluation. Teachers are expected by administrators and preservice teacher are expected by university teachers to teach students at these standards. The lower levels, which should be used less often, are knowledge, comprehension, and application (Johnson & Lamb, 2007). One of the research questions of this study was to determine exactly how teachers are combining technology and higher order

thinking skills in their lesson plans. In order to gather this information, teachers were asked to submit lesson plans that used a level or combination of levels of higher order thinking skills.

Critical thinking, or the use of higher order thinking skills, has been found to increase student success (Astleitner, 2002). Examples of using higher order thinking skills include students solving a problem, evaluating a situation, finding alternate solutions, and being able to support their opinion (Astleitner, 2002; Bissell & Lemons, 2006; Howe, 2000, Johnson & Lamb, 2007; & Miri, et. al., 2007). There were many lesson plans offered which used one, two, or even all three of the levels of higher order thinking skills. For example, the following lessons require critical thinking.

> “My students do a Web Quest on meeting the nutritional needs of pregnancy. Prior to the quest, nutritional guidelines are covered. I use the University of Illinois NATS system, which requires the student to design a diet for a pregnant female, aged 19-30. The system will analyze their choices and they must analyze where they succeeded and where they are deficient. Another favorite activity, is after a week of "Reality Parenthood" where new parents speak on the physical, social/emotional, educational and financial challenges of parenthood, (and newborn and OB nurses present), the students design a brochure in Publisher sharing their information for peer review. The brochures are placed in our nurses' office.”

In total, 77 lesson plans were submitted that required higher order thinking skills from students. Of all the participants, 89% reported specifically using technology to teach higher order thinking skills. Although only 44% of participants submitted a lesson plan that used both of these skills, there were other lessons offered that used either technology or higher order thinking skills separately. These lessons were not included in this study. The use of higher order thinking skills appears to be common in family consumer sciences classrooms.

In one study, in Turkey, students learned through project-based learning which required the use of higher order thinking skills (Mahiroğlu, 2007). The author asked teachers to rate their students' abilities on a long list of higher order thinking skills (Mahiroğlu, 2007). Teachers rated their students as average across the chart (Mahiroğlu, 2007). This chart, though, offers many suggestions for possible lesson plans. The skills listed include "determining and reaching to resources," "judging the solution," "applying the selected solution to the problem," and "understanding of an opinion clearly and interpreting biased opinions" (Mahiroğlu, 2007). There are many opportunities to require students in one's classroom to use higher order thinking skills. Teachers who may be looking for ideas can use the ones obtained in this study. They may come up with a new idea based on someone else's lesson. That is how teachers and students could grow in their thinking process.

Family Consumer Sciences

The field of family consumer sciences includes many areas including Foods, Child Development, Parenting, Life Skills, Interior Design, Family, Hospitality, Consumerism, Clothing and Textiles, And Education. Many family consumer sciences teachers teach more than one subject as they are endorsed in multiple areas. The focus of the field is to prepare students for life, such as how to prepare food safely, use credit wisely, and how to care for children. Participants in this study reported that technology was modeled by over 50% of teachers in the following classes Child Development, Consumerism and Finance, and Foods and Nutrition. As far as students being required to use technology this

was reported in over 50% of the responses in Child Development, Consumerism and Finance, Foods and Nutrition, and Interior Design. The question did specify "computer technology" based on Croxall's (2002) original study. Teachers who use technology not necessitating an actual computer may have answered this question in the negative. The question perhaps should have been reworded to say "technology in general."

The use of various hardware devices was seen more by teachers rather than students in all categories except for the simulator babies. Teachers reported using digital cameras the most (73%) followed by simulator babies (56%) and computerized sewing machines (48%). Students however were not reported as being required to use these technologies very much aside from 73% listed for simulator babies. Other electronic choices given were scanners, smart boards, and game show clickers/audio response systems. Fifty-eight percent of teachers reported that smart boards were not available while 48% reported likewise for game show clickers/audio response systems. There were a number of comments from teachers on the use of smart boards such as "Smart board is available, but the LRC [Library Resource Center] person makes it very difficult to use and certainly NOT available for use in one's classroom." Another comment was,

> "Smart board and Senteo clicker training was made available last semester, but I felt apprehensive about the time required to learn, then apply it in my classes, so chose not to participate. My time is very valuable and it is difficult to meet the regular demands of my position."

Apparently, time and training are the determining factors in these situations. Why are students not using this technology more often in the classroom? Are teachers

afraid students will break the devices or are there simply not enough to let all student use the technology? This is cause for further research.

On the other hand, various software technologies were reported as required by family consumer sciences students more often than the hardware. Electronic applications asked about were Word-Processing (e.g., Microsoft Word), Desktop Publishing (e.g., Publisher), Spreadsheets (e.g., Excel), Databases (e.g., Access), Presentation Software (e.g., Power Point), Hypermedia Software (searching on the Internet), Web Design, and Blogs. Examples were provided to avoid any confusion over the terms. Over 50% of teachers reported modeling Word-Processing, Desktop Publishing, Presentation software, and Hypermedia software. Student were required to use Word – processing the most at 90%, then Presentation software (74%), and Hypermedia software (71%). Databases, Web design, and Blogs were required and modeled the least. Family consumer sciences teachers do therefore expect their students to use technology as part of the majority of classes with the exception of Apparel and Textiles and Family Living. As Thaler-Carter (2000) described about at her school, teachers are combining foods service, business, and technology to run a café. One lesson plan submitted was similar in nature.

> "Restaurant Management - The students are responsible for planning and orchestrating a catering job. They have to design spreadsheets to organize the kitchen duties as well as the dining room staff. They must order their own recipes online and plan the entire menu."

This lesson could be complicated and time consuming for the teacher to plan. There were other more simple lessons submitted for those less familiar with technology that also combine different skills such as the following.

> "In my Nutrition & Fitness classes, my students are required to find media articles about nutrition. They write a summary of the article and have to analyze if the information in the article they read is valid based on the nutritional principles they have learned in class. They need to be able to defend their point of view."

The family consumer sciences teachers surveyed, teach a variety of classes and have used many different types of hardware and software. For those teachers who do not model specific technology that is available to them, they could perhaps find a colleague or student who would be happy to teach them, so they could increase their technological knowledge.

Implications for Teachers

This study was designed to help family consumer sciences teachers share lesson plans that teach both technology and higher order thinking skills. The goal was to collect a variety of lessons and make them available to teachers. Teachers in any field can use these lessons. Often one idea will spark another new lesson plan idea even if not the exact same subject. For example, one might read about students discussing the pros and cons of a situation, writing down their thoughts, and supporting their viewpoints. This lesson could be applied in a variety of classes such as science, history, parenting, business, or education. A web site, http://sites.google.com/site/familyconsumersciencesslessons/, was created, that lists the 77 lesson plans used in this study. Participants of the study were emailed the website for use in their lesson planning. The site is simple to access because no log in password or fee is required as with other lesson plan web sites.

Quantitative findings from this study are also beneficial to teachers. It is encouraging to see that the majority of teachers in one's field are already using

technology and are teaching higher order thinking skills. Often teachers feel imposed on to try new teaching methods or to make sure they are teaching students critical thinking skills. By reading through the questions related to the International Society for Technology in Education standards, teachers might realize that they may already be teaching these skills to their students. The standards portion of the survey can be used as a self-test of one's teaching methods. If there are certain items that a teacher does not *strongly-agree* with that she/he does, then those are items they may wish to learn more about or may wish to try to include in future lessons.

Implications for School Administrators

This study is an encouraging indication that family consumer sciences programs are strong enough to support multiple teachers in schools. Forty-eight percent of teachers reported teaching with four to five other family consumer sciences faculty in their department. Based on the results from the independent variable questions, family consumer sciences teacher are receiving sufficient amounts of support and training in using technology, but they could use even more help in the area of time. Teachers need more time to learn to use and implement technology in their lesson plans. As only 65% of teachers reported having enough time to plan to use technology, more time would likely be welcome such as during professional development days.

Along similar lines, since 90% of these family consumer sciences teachers reported having sufficient training to use computers, and 96% categorized themselves as having average, advance, or very advance computer skills, they

may not want professional development in this area. If a technology seminar is planned, it would be helpful to find out what specific areas of interest teachers have and perhaps separate those teachers who are already comfortable with technology from those who are beginners. There may be other appropriate times, such as on institute days, when those who are proficient with technology could teach their colleagues.

Administrators likely prefer their teachers to use the latest technology available. After purchasing items such as smart boards, administrators would expect to see these items utilized in the classroom. Based on comments from participants, smart boards were the one item they had the most difficulty using. Family consumer sciences teachers said they either did not have the time to incorporate into their lessons, it was not made available to them, or they simply did not have enough experience using it and little training was available. Administrators should guarantee that when purchasing new technology, enough time is devoted for teachers' professional development.

The majority, 52%, of family consumer sciences teachers said they were somewhat familiar with the International Society for Technology in Education National Education Technology Standards and Performance Indicators for Teachers whereas only 15% said an affirmative yes to familiarity. Over 50% of teachers strongly-agree or agreed on every item in the standards questions, stating that they were following that standard. Therefore, although not entirely familiar with the standards themselves, family consumer sciences teachers are already are following them. This may be an area of staff development with which

administrators should follow up. Are other departments' teachers following the standards? The next step of importance for administrators would be to determine if the students are able to follow the standards. In other words, what areas of technology are students lacking that they will need in today's international job market? More or different results might have been obtained if not for a few limitations.

Limitations

One limitation was that the open-ended question was not worded correctly. It should have asked for a technology-specific lesson plan. Luckily, the majority of teachers deduced that as the survey was on technology, a lesson plan utilizing technology was preferred. There may have been some though who would have written about an alternate lesson plan.

Teachers who were wary of taking an online survey or who did not have enough time to complete their own work at the time the survey was distributed did not have their opinions voiced. Therefore most of the teachers who did reply are likely those most comfortable taking an online survey. As initial contact was done through teacher's school emails, those teachers who do not check their emails on a regular basis may not have seen the survey. A few teachers could not be reached because the email was not accepted perhaps due to the mass email usage.

As with any survey the researcher hopes that participants chose the most honest answer rather than one that makes them look as though they are doing better or more than they are. If any of the survey questions were confusing, this

may have led participants to choose the incorrect answer according to their views. The question about one's budget was one that may have made teachers wary because fifty percent of teachers answered, "Do not know or do not wish to share." As the two answers were combined it is hard to speculate which was the true response. Thirty-eight percent of teachers have a budget of over $3000. This question could have been worded better with different ranges that went higher and the last combined option separated into two questions.

Indications for Further Research

What ways do teachers need help in learning to use technology in the classroom? If an in-service were offered on technology, what would teachers like to be taught? What new "gadgets" do they wish they had? Are there specific software or hardware they want to learn? What are teachers frustrated about in terms of technology? This study did not answer these questions, indicating a need for a follow up study. More research needs to be conducted with further questions to determine why one teacher is teaching higher order thinking skills and another is not. It would be interesting to repeat this study in 10 years to compare the changes in technology. Perhaps by then using blogs, wikis, and sites such as YouTube will be common and there will more than likely be many new technologies available to teachers and students. It would be beneficial to add more lesson plans to the newly created web site. Teachers could be asked to contribute more lesson plans as they created them. Observing and interview teachers would provide much more information.

Another question for further research is if having a greater number of teachers in one's department equals a greater use of technology, as teachers would have colleagues with which to share ideas. Is there a correlation between schools that have more money and the use of technology? One could compare family consumer sciences teachers' answers on the International Society for Technology in Education's National Educational Technology Standards and Performance Indicators with a group of students and their answers regarding student standards. Are students more or less proficient using technology as compared to their teachers? For a more controlled study, family consumer sciences teachers and students in family consumer sciences classes should be the ones compared.

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APPENDICES

Appendix A. Cover Letters

Cover Letter Sent By Email

Dear Fellow Family Consumer Sciences Teachers,

My name is Beth Hirose. I am a family consumer sciences teacher at Round Lake Senior High School and a doctoral student at Argosy University, in Schaumburg, Illinois.

During this past summer, I attended the AAFCS, American Association of Family Consumer Sciences, National Conference on technology in Milwaukee, Wisconsin, where I met many of you. I also know some of you through Delta Kappa Gamma and/or the American Association of University Women. I met others of you when collaborating with the Lake County teachers at the October 16, 2008 meeting at Antioch Community High School. A few of us took our family consumer sciences coursework together at Northern Illinois University during 2001-2003.

I am conducting research in the field of Family Consumer Sciences in the Northern Illinois Region by administering a survey. The survey takes an average of 10 minutes to complete and is completely anonymous. I am only surveying about 200 teachers so everyone's participation means a great deal to this valuable research. May you take a few minutes to participate in this study?

Please follow this link [SurveyLink] on SurveyMonkey® to learn more about my research and take the survey. I would appreciate it if you could take the survey in the next two weeks. I will send a reminder to everyone on Monday, January 26. The survey will be available until Midnight on Sunday, February 8.

Please contact me by phone or email, if you have any questions. I am available in the evenings at 847-234-4305 or by email at <bhirose@cnw.stu.argosyu.edu>. You may also contact my committee chair, Dr. Kenneth Arndt, with any questions at 847-551-8410 or at <kenneth.arndt@d300.org>.

Thank you for your time.

Sincerely,

Beth Hirose, MS, CFCS-HDFS

Online Cover Letter To Introduce Purpose Of Survey

Dear Fellow Family Consumer Sciences Teachers

My name is Beth Hirose. I am a family consumer sciences teacher at Round Lake Senior High School and a doctoral student at Argosy University, in Schaumburg, Illinois. I am conducting research in the field of Family Consumer Sciences in the Northern Illinois Region. During this past summer, I attended the AAFCS, American Association of Family Consumer Sciences, National Conference on technology in Milwaukee, Wisconsin, where I met many of you. I also know some of you through Delta Kappa Gamma and/or the American Association of University Women. I met others of you when collaborating with the Lake County teachers at the October 16, 2008 meeting at Antioch Community High School. A few of us took our family consumer sciences coursework together at Northern Illinois University during 2001-2003.

The purpose of the research is to fill the void, which undoubtedly you have noticed, of available resources in our field. I am interested in gathering higher order thinking skills lessons where technology is utilized. By gathering data from each of you on the types of technology you use and the training you have had using it, I will discover in what areas we need more knowledge. Eventually, I would like to create a website resource listing some of your best lesson plan ideas so that we may all benefit from each other's wisdom. There are so few resources for family consumer sciences on how to incorporate technology into our lesson plans and even fewer if any that focus on higher order thinking skills, that there is a great need to compile such data. This study will also focus on whether you feel you are sufficiently supported and trained in using technology. Following this letter, is a consent form giving me permission to collect data from you through the use of a survey. The survey takes an average of ten minutes to complete and is completely anonymous. I am only surveying about 200 teachers so everyone's participation means a great deal to this valuable research. May you take a few minutes to participate in this study? We must demonstrate to others in our school districts, especially school boards, the value that family consumer sciences classes add to student's lives. It is especially important when we use technology to teach higher order thinking skills: analyze, synthesis, and evaluate, as these skills are used in the workforce.

Participation in this study from all teachers in the Northern Illinois Region would be greatly appreciated in order to obtain a wide overview of the area. I know how busy you are, as I too am a FACS high school teacher. This survey will be ten minutes well spent for our field. Please contact me by phone or email, if you have any questions or would like to receive the data results. I am available in the evenings at 847-234-4305 or by email at <bhirose@cnw.stu.argosyu.edu>. You may also contact my committee chair, Dr. Kenneth Arndt, with any questions at 847-551-8410 or at <kenneth.arndt@d300.org>.

Thank you for your time.

Sincerely,
Beth Hirose, MS, CFCS-HDFS

Appendix B. Consent Form

1. Please read and agree to the consent form before taking the survey. You may print it for your own records.

Consent Form

Family Consumer Sciences Teachers' Use of Technology to Teach Higher Order Thinking Skills

I have been asked to participate in a research study regarding the effects of technology training on the use of technology to teach higher order thinking skills. I was selected to be a possible participant because I am a family consumer sciences (FACS) high school teacher in the Northern Illinois Region. A total of about 200 people have been asked to participate in this study. The purpose of this study is to determine how technology is being used in family consumer sciences high school classes

If I agree to be in this study, I will be asked to complete a survey. I understand the survey, except for the lesson plan question, will be used exclusively for the purpose of this study. The open-ended lesson plan question, if I choose to submit a lesson plan, may be used on a future web site for the benefit of all FACS teachers. The survey takes an average of ten minutes. There are no risks associated with this study. The benefits of participation are gaining insight as to how I may already be teaching higher order thinking skills and/or using technology in beneficial ways, as well as my contribution to the betterment of other teachers and the demonstration of the importance of family consumer sciences.

I will receive no monetary reimbursement for participation in this study. This study is anonymous. My name will not appear anywhere in the study. The records of this study will be kept private. No identifiers linking me to the study will be included in any sort of report that might be published. Research records will be stored securely and only Beth Hirose will have access to the records.

My decision whether or not to participate will not affect my current or future relations with Argosy University. If I decide to participate, I am free to refuse to answer any of the questions that may make me uncomfortable. I can withdraw at any time without my relations with the university, job, benefits, etc., being affected. I can contact Beth Hirose at 847-234-4305 or <bhirose@cnw.stu.argosyu.edu> or Dr. Kenneth Arndt at <kenneth.arndt@d300.org> with any questions about this study.

I understand that this research study has been reviewed and certified by the Institutional Review Board, Argosy University – Schaumburg. For research-related problems or questions regarding participants' rights, I can contact the Institutional Review Board through the IRB Chair, Dr. Peter Dodzik, at 847-969-4935 or at <pdodzik@argosy.edu>.

I have read and understand the explanation provided to me. I have had all my questions answered to my satisfaction, and I voluntarily agree to participate in this study. I understand I can print a copy of this consent form if I would like. By agreeing to this document, I consent to participate in the study.

◯ I agree to participate in this survey.
◯ I do not agree to participate in this survey.

Appendix C. Survey Instrument

Survey Instrument

Survey Instrument Technology Survey for Family and Consumer Sciences (FACS) Teacher Educators Part A

2. How do you see computer technology fitting into your program?

	Strongly-Agree	Agree	Disagree	Strongly-Disagree
• My high school provides sufficient financial support for computer technology.	◯	◯	◯	◯
• My high school provides me the training I need so I can comfortably use computers and technology for teaching.	◯	◯	◯	◯
• My high school provides me enough time to plan to use computers and technology for teaching.	◯	◯	◯	◯
• My high school provides me enough computers and sufficient technology for teaching.	◯	◯	◯	◯
• It is important for teachers to use computer technology in their FACS classes.	◯	◯	◯	◯
• I am confident in my ability to teach/demonstrate computer skills in the classroom.	◯	◯	◯	◯

3. How would you rate your computer skills? Please choose the best response.

◯ Very advanced ◯ Advanced ◯ Average/Adequate ◯ Limited ◯ Very Limited

4. In which subject areas is computer technology modeled and/or required at your school? Please choose all that apply.

	Modeled by the teacher	Required of the students	Not used or do not know
- Apparel and textiles	☐	☐	☐
- Child development	☐	☐	☐
- Consumerism and Finance	☐	☐	☐
- Family Living	☐	☐	☐
- Foods and Nutrition	☐	☐	☐
- Interior Design	☐	☐	☐

- Other(s): Please specify

☐

5. What types of electronic technology do you model and/or require? Please choose all that apply.

	Modeled by the teacher	Required of the students	Not available
- Digital Cameras	☐	☐	☐
- Scanners	☐	☐	☐
- Simulator Babies	☐	☐	☐
- Computerized sewing machine	☐	☐	☐
- Smart board (interactive white board)	☐	☐	☐
- Game show clickers/audio response systems	☐	☐	☐

- Other(s): Please specify

☐

6. What types of electronic applications are modeled/required? Please choose all that apply.

	Modeled by the teacher	Required of the students	Not used or do not know
- Word-processing (ex. Microsoft Word)	☐	☐	☐
- Desktop publishing (ex. Publisher)	☐	☐	☐
- Spreadsheet (ex. Excel)	☐	☐	☐
- Databases (ex. Access)	☐	☐	☐
- Presentation software (ex. Power Point)	☐	☐	☐
- Hypermedia software (searching on the World Wide Web, active)	☐	☐	☐
- Web design	☐	☐	☐
- Blogs	☐	☐	☐

- Other(s): Please specify

☐

Technology Survey for Family Consumer Sciences Teachers Part B

The following questions deal directly with the International Society for Technology in Education (ISTE) National Educational Technology Standards and Performance Indicators for Teachers. Please provide your input as to how prepared you feel you are in meeting the standards and performance indicators.

7. Are you familiar with the ISTE standards and performance indicators? Please choose the best response.

◯ Yes ◯ Somewhat ◯ No

8. As a family consumer sciences teacher, I:

	Strongly-Agree	Agree	Disagree	Strongly-Disagree
- Solve routine hardware and software problems	◯	◯	◯	◯
- Make informed choices about technology systems, resources, and services	◯	◯	◯	◯
- Use technology tools/information resources to increase productivity	◯	◯	◯	◯
- Use technology tools/information resources to promote creativity	◯	◯	◯	◯
- Use technology tools/information resources to facilitate academic learning	◯	◯	◯	◯
- Use technology resources to facilitate higher order/ complex thinking skills, including problem solving, critical thinking, informed decision-making, knowledge construction, and creativity	◯	◯	◯	◯

9. As a family consumer sciences teacher, I:

	Strongly-Agree	Agree	Disagree	Strongly-Disagree	Do Not Know
- Identify the benefits of technology to maximize student learning	◯	◯	◯	◯	◯
- Identify the benefits of technology to facilitate higher order thinking skills	◯	◯	◯	◯	◯
- Identify technology resources available in the school	◯	◯	◯	◯	◯

- Analyze how accessibility to technology resources affects planning for instruction	○	○	○	○	○
- Use hardware/software technology resources specifically designed for use by secondary students to meet specific teaching and learning objectives	○	○	○	○	○

10. As a family consumer sciences teacher, I:

	Strongly-Agree	Agree	Disagree	Strongly-Disagree	Do Not Know
- Plan for the management of electronic instructional resources within a lesson design by identifying potential problems and planning for solutions	○	○	○	○	○
- Plan/teach student-centered learning activities and lessons in which students apply technology tools and resources.	○	○	○	○	○
- Research/evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information resources to be used by students	○	○	○	○	○
- Discuss technology-based assessment and evaluation strategies	○	○	○	○	○
- Examine technology tools used to collect, analyze, interpret, represent, and communicate student performance data	○	○	○	○	○
- Integrate technology-based assessment strategies and tools into plans for evaluating specific learning activities	○	○	○	○	○

Open-Ended Question

The answers to this question will provide specific examples of lessons to help other teachers in our field and may eventually be posted on a family consumer sciences web site.

11. In a few sentences describe your best lesson where your students use higher order thinking skills (analysis, synthesis, and/or evaluation). Do not worry about which skill the lesson focuses on. Please state the name of the class and give a brief description of the lesson.

You're almost done! Thank you so much for your responses. The last page has just a few short questions about you. Click next to continue.

Technology Survey for Family Consumer Sciences Teachers Part C

Please tell about your program, your training, your school, and yourself.

12. Which of the following classes are you teaching during the 2008-2009 school year?
    - ☐ Apparel and textiles
    - ☐ Child development
    - ☐ Consumerism and Finance
    - ☐ Family Living
    - ☐ Foods and Nutrition
    - ☐ Interior Design
    - Other(s): Please specify

13. Were you required to take a technology course prior to your graduation from college? ◯ Yes ◯ No

14. Have you taken any technology related classes, workshops, seminars, or online sessions since becoming a teacher? ◯ Yes ◯ No

15. If you answered yes to the above question, how many classes etc have you taken? ◯ 1-2 ◯ 3- 5 ◯ 6 or more

16. What kind of school do you teach in? ◯ Rural ◯ Suburban ◯ City

17. How many FACS teachers are in your department including you? ◯ 1 ◯ 2-3 ◯ 4-5 ◯ 6+

18. How many students are in your school? ◯ Under 1000 ◯ 1000-2000 ◯ 2001- 3000 ◯ 3001-4000 ◯ 4000 +

19. How much budget money does your department receive?

- ☐ Under $500
- ☐ $501-1000
- ☐ $1001-1500
- ☐ $1501-$2000
- ☐ $2001-$2500
- ☐ $2501-$3000
- ☐ Over $3000
- ☐ Do not know or do not wish to share

20. What is your age range? ◯ 21-30 ◯ 31-40 ◯ 41-50 ◯ 51-60 ◯ 61+

Thank you!

Thank you very much for your valuable time and your contribution to the field of Family Consumer Sciences! Please click "Done" to complete the survey and send your responses.

Appendix D. Data Tables

Data Tables

Table D1
Frequencies Variable 1: My High School Provides Sufficient Financial Support For Computer Technology (4.00= "Strongly-Agree," 3.00= "Agree," 2.00= "Disagree," 1.00= "Strongly-Disagree")

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	1	.6	.6	.6
	2.00	21	12.5	12.5	13.1
	3.00	74	44.0	44.0	57.1
	4.00	72	42.9	42.9	100.0
	Total	168	100.0	100.0	

Table D2
Frequencies Variable 2: My High School Provides Me the Training I Need So I Can Comfortably Use Computers and Technology For Teaching (4.00= "Strongly-Agree," 3.00= "Agree," 2.00= "Disagree," 1.00= "Strongly-Disagree")

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	1	.6	.6	.6
	2.00	16	9.5	9.5	10.1
	3.00	90	53.6	53.6	63.7
	4.00	61	36.3	36.3	100.0
	Total	168	100.0	100.0	

Table D3

Frequencies Variable 3: My High School Provides Me Enough Time To Plan To Use Computers and Technology For Teaching (4.00= "Strongly-Agree," 3.00= "Agree," 2.00= "Disagree," 1.00= "Strongly-Disagree")

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	2	1.2	1.3	1.3
	2.00	49	29.2	30.6	31.9
	3.00	83	49.4	51.9	83.8
	4.00	26	15.5	16.3	100.0
	Total	160	95.2	100.0	
Missing	System	8	4.8		
Total		168	100.0		

Table D4

Frequencies Variable 4: My High School Provides Me Enough Computers and Sufficient Technology For Teaching (4.00= "Strongly-Agree," 3.00= "Agree," 2.00= "Disagree," 1.00= "Strongly-Disagree")

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	5	3.0	3.0	3.0
	2.00	43	25.6	25.7	28.7
	3.00	73	43.5	43.7	72.5
	4.00	46	27.4	27.5	100.0
	Total	167	99.4	100.0	
Missing	System	1	.6		
Total		168	100.0		

Table D5

Frequencies Variable 5: I Am Confident In My Ability To Teach/Demonstrate Computer Skills In The Classroom (4.00= "Strongly-Agree," 3.00= "Agree," 2.00= "Disagree," 1.00= "Strongly-Disagree")

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	2	1.2	1.2	1.2
	2.00	20	11.9	12.0	13.3
	3.00	84	50.0	50.6	63.9
	4.00	60	35.7	36.1	100.0
	Total	166	98.8	100.0	
Missing	System	2	1.2		
Total		168	100.0		

Table D6

Frequencies Variable 6: As A Family Consumer Sciences Teacher I: Use Technology Resources To Facilitate Higher Order/Complex Thinking Skills, Including Problem Solving, Critical Thinking, Informed Decision-Making, Knowledge Construction, and Creativity
(4.00= "Strongly-Agree," 3.00= "Agree," 2.00= "Disagree," 1.00= "Strongly-Disagree")

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	1	.6	.6	.6
	2.00	15	8.9	9.1	9.7
	3.00	94	56.0	57.0	66.7
	4.00	55	32.7	33.3	100.0
	Total	165	98.2	100.0	
Missing	System	3	1.8		
Total		168	100.0		

Table D7

Mean and t-test of Teachers' Confidence in Their Ability To Teach/Demonstrate Computer Skills Compared To Their Personal Computer Skills Between 3.00= "Agree" and 4.00= "Strongly-Agree"

ABLE		N	Mean	Std. Deviation
SKILL	3.00	81	3.3086	.4910
	4.00	61	3.9672	.5153

Student t-test for Equality of Means	*t*	df	Sig. (2-tailed)
SKILL	-7.745	140	.000

Table D8

Comparison of Teacher's Knowledge of International Society for Technology in Education National Educational Technology Standards and Performance Indicators for Teachers Questions and Rating of Confidence in Ability Between 3.00= "Agree" and 4.00= "Strongly-Agree"

ABLE		N	Mean	Std. Deviation
ISTE	3.00	82	1.8659	.6239
	4.00	58	1.8621	.7597

Student t-test for Equality of Means	*t*	df	Sig. (2-tailed)
ISTE	.032	138	.974

Table D9
Teacher's Age Compared to Their Rating of Confidence in Ability Between 3.00=Ages 31-40 and 4.00=Ages 41-50

ABLE		N	Mean	Std. Deviation
AGE	3.00	80	3.4500	1.3014
	4.00	57	3.0351	1.3088

Student t-test for Equality of Means	*t*	df	Sig. (2-tailed)
AGE	1.835	135	.069

Table D10

Comparison of The 21-30 Year Olds (2.00) To The 51-60Year Olds (5.00) With The First Set Of Standards Questions (See Appendix C Question 8) (Tech=Technology, Info.=Information, HOTS=Higher Order Thinking Skills)

	AGE	N	Mean	Std. Deviation
Solve Hardware/Software Problems	2.00	62	2.5323	.7404
	5.00	42	2.5238	.9936
Make Informed Choices	2.00	63	2.7619	.6651
	5.00	42	2.5714	.7696
Use Tech Tools/Info. To Increase Productivity	2.00	63	3.2540	.5948
	5.00	42	3.0714	.6398
Use Tech Tools/Info. To Promote Creativity	2.00	62	3.3387	.5415
	5.00	41	3.0488	.5895
Use Tech Tools/Info. To Facilitate Learning	2.00	63	3.3810	.4895
	5.00	41	3.2439	.5376
Use Tech to Facility HOTS	2.00	62	3.2419	.5635
	5.00	42	3.0476	.6228

(*table continues*)

Table D10 (*continued*)

Student t-test for Equality of Means	*t*	df	Sig. (2-tailed)
Solve Hardware/Software Problems	.050	102	.960
Make Informed Choices	1.349	103	.180
Use Tech Tools/Info. To Increase Productivity	1.495	103	.138
Use Tech Tools/Info. To Promote Creativity	2.567	101	.012
Use Tech Tools/Info. To Facilitate Learning	1.342	102	.183
Use Tech to Facility HOTS	1.653	102	.101

Table D11

Subject Areas Where Computer Technology is Modeled by Teachers and/or Required by Students

	Modeled by the teacher	Required of the students	Not used or do not know
Apparel and textiles	47%	40%	37%
Child Development	64%	68%	17%
Consumerism and Finance	56%	58%	22%
Family Living	42%	39%	36%
Foods and Nutrition	71%	60%	16%
Interior Design	49%	51%	33%

Table D12

Types of Electronic Technology Modeled By Teachers and/or Required By Students

	Modeled by the teacher	Required of the students	Not available
Digital Cameras	73%	26%	13%
Scanners	42%	10%	31%
Simulator Babies	56%	73%	10%
Computerized sewing machine	48%	42%	31%
Smart board (interactive white board)	20%	5%	58%
Game show clickers/audio response systems	31%	15%	48%

Table D13
Types of Electronic Applications Modeled By Teachers and/or Required By Students

	Modeled by the teacher	Required of the students	Not used or do not know
Word-processing (e.g., Microsoft Word)	77%	90%	1%
Desktop publishing (e.g., Publisher)	56%	48%	27%
Spreadsheet (e.g., Excel)	45%	28%	34%
Databases (e.g., Access)	23%	15%	56%
Presentation software (e.g., Power Point)	88%	74%	3%
Hypermedia software (searching on the World Wide Web, active)	68%	71%	14%
Web design	23%	10%	57%
Blogs	10%	7%	67%

Table D14

Comparison Between Teachers' Rating of Their Ability To Use Technology With The Application Of Specific Software In Their Classrooms (Application: 2.00=Modeled by Teacher, 4.00=Modeled by Teacher and Required of Students) (Able: 2.00= "Disagree," 4.00= "Strongly-Agree")

ABLE		N	Mean	Std. Deviation
Word Processing	2.00	19	3.4211	.6070
	4.00	59	3.6780	.7057
Desktop Publishing	2.00	17	2.1765	1.2862
	4.00	57	2.8947	1.2491
Spreadsheets	2.00	16	1.9375	1.1815
	4.00	54	2.2593	1.2314
Databases	2.00	17	1.3529	.6063
	4.00	50	1.7200	1.1436
Presentation Software	2.00	18	3.0000	1.0290
	4.00	61	3.5082	.8684
Hypermedia Software	2.00	17	2.9412	1.1974
	4.00	57	3.3860	1.0816
Web Design	2.00	16	1.2500	.7746
	4.00	49	1.4694	.8191

(*table continues*)

Table D14 (*continued*)

Student t-test for Equality of Means	*t*	df	Sig. (2-tailed)
Word Processing	-1.425	76	.158
Desktop Publishing	-2.067	72	.042
Spreadsheets	-.926	68	.358
Databases	-1.260	65	.212
Presentation Software	-2.090	77	.040
Hypermedia Software	-1.452	72	.151
Web Design	-.942	63	.350

Note: Blogs were not included as such a small percentage of teachers used or required them.

Table D15
Comparison of Teachers Responses to International Society for Technology in Education National Educational Technology Standards and Performance Indicators for Teachers

	"Strongly-Agree" and "Agree" (SA, A)	"Disagree" and "Strongly-Disagree" (SD, D)	"Do Not Know" (DK)
Solve routine hardware and software problems	54%	46%	0%
Make informed choices about technology systems, resources, and services	65%	35%	0%
Use technology tools/information resources to increase productivity	95%	5%	0%
Use technology tools/information resources to promote creativity	95%	5%	0%
Use technology tools/information resources to facilitate academic learning	98%	2%	0%
Use technology resources to facilitate higher order/complex thinking skills, including problem solving, critical thinking, informed decision-making, knowledge construction, and creativity	89%	11%	0%
Identify the benefits of technology to maximize student learning	96%	4%	1%

(*table continues*)

Table D15 (*continued*)

	(SA, A)	(SD, D)	(DK)
Identify the benefits of technology to facilitate higher order thinking skills	90%	7%	2%
Identify technology resources available in the school	95%	4%	1%
Analyze how accessibility to technology resources affects planning for instruction	91%	6%	3%
Use hardware/software technology resources specifically designed for use by secondary students to meet specific teaching and learning objectives	82%	14%	5%
Plan for the management of electronic instructional resources within a lesson design by identifying potential problems and planning for solutions	77%	19%	4%
Plan/teach student-centered learning activities and lessons in which students apply technology tools and resources.	93%	7%	1%
Research/evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information resources to be used by students	77%	20%	3%

(*table continues)*

Table D15 (*continued*)

	(SA, A)	(SD, D)	(DK)
Discuss technology-based assessment and evaluation strategies	58%	36%	6%
Examine technology tools used to collect, analyze, interpret, represent, and communicate student performance data	62%	34%	4%

Appendix E: Open-Ended Question Responses

Appendix E: Open-Ended Question Responses

Listed By Course

Child Care/Child Development

- “Child Development and Parenting, The students had to research certain STDS on websites that were provided. They had to research in groups with each assigned to a specific task. Once they were finished, they had to create a PowerPoint, save it to a shared drive and then present it. It is a great project and I have been doing this one for 3 years.”
- “Child Development, the students have to design their own child care facility using Word, scanners, PowerPoint, Publisher, all of Microsoft office, and digital cameras and video. Also provide a bi-weekly newsletter for the parents using the same technology tools.”
- “Early Childhood Education utilizes many technology skills when putting together a 100 page portfolio”
- “Child Development II: Students create a lesson plan including activities that they research on the Internet for age-appropriate use in a student-led playschool”
- “Child Development TO SPANK, OR NOT TO SPANK? Students are asked to take a stance on the controversial topic of spanking and defend their position. They are required to research and obtain credible information. Our media center specialist provides support and assistance during computer lab time.”

- “In Practicum in Early Childhood Education, I created a webquest where students are given the assignment of a substitute preschool teacher. They have to find 3 activities on the web that deal with 3 different curriculum areas and are about a specific theme.”
- “Students create a lesson plan for a specific curricular area to teach three and four-year-old preschoolers. Students must use at least 3 resources (can be internet sites) to create their lesson. Students evaluate the age-appropriateness and practicality of the lesson plan ideas when creating their own lessons.”
- “Child Care: Baby Think It Over Simulator -Students will use the BTIO software (sheet produced by teacher) to analyze the percentage data. They will find the averages, medians, modes range, as well as the incorporation of graphs. This will help students determine their position, based on care percentage, out of all the students taking home the infant simulator.”
- “In an advanced child development course my students create a brochure for parents.”
- “The Baby Think It Over project requires students to analyze their life and how a baby would influence it. The project requires students to evaluate how a baby would change their lives.”
- “child development students planned a preschool day using internet resourced activities”

- “In Child Day Care Occupations the students test the preschooler’s abilities and put together a professional letter. This letter discusses the preschooler’s abilities, likes/dislikes etc in order to educate the parents on their child's readiness for kindergarten. They also give the parents suggestions of activities the parents can do at home to help the child improve their skills. I do allow 4 preschool days for the children to test the preschooler’s abilities.”
- “In our Child Abuse unit for Child Dev. we start the period out by asking the students to write a one page paper about the responsibilities of parenting while the sounds of screaming and crying children play in the background. Of course, the papers are horrible and no one ever writes a paper in 10 minutes. However, then we discuss via PowerPoint how they felt, etc. Then link it to child abuse. After that, we have a poem we analyze that may or may not be about abuse. We discuss clues, etc. Then we split up and they are all give scenarios about "possible" abuse situations. We discuss what makes them cases of abuse or not and debate them together.”
- “My students in my preschool lab create a case study power point presentation on a particular child. The students evaluate the child's different areas of development and compile the information into a presentation which they then present in a parent conference.”

- “Selection of suitable child care Advanced Child Development Challenge student to make suitable choice related to profile of assigned child.”

Consumer Education

- “Consumer Education, Students used the Internet to find information about potential automobiles they would like to buy. They then analyzed which car they could afford, why it would be good for them, and how they could lower the price. It was then put into a PowerPoint presentation and shown to the class.”
- “Consumer Education budget unit: They use the computer to present their project with a power point. they research using websites for housing, cars, renter's insurance, budget packages, comparison food prices, clothing, etc. The students develop interactive activities for the class when they teach it. Their tests are done on the computer and put in a dropbox.”
- “Stock market project students have to use the web, excel, and word to create, analyze, and predict future outcomes in the stock market. This is for consumer management”
- “The students work on a real life project in Consumer Management. At the end of the project, they use an excel spreadsheet to see how much money they have spent in a budget for a month.”
- “Consumers education: selection of housing in the area they need to calculate and figure cost to purchase a mortgage they need to select financial institutions in the area and compare them with reference to point,

interest rates, down payments, difference in rates according to length of the term. They then need to present a power point presentation”

- “In consumer education, students research careers, prepare a budget based on the careers, find an apartment on line etc.”
- “Consumer Economics. Evaluating available credit and loan choices.”
- “Consumer Education Class: Using Excel to show the calculation of compounding interest over time (44 years).”
- “Consumer education: we evaluate different rental homes and homes to purchase. The students look at their needs and wants and evaluate what would be a good rental unit.”
- “Consumer Management. Putting together a Stock Portfolio, by researching different companies on the NYSE”
- “Real World Project Students are required to "rent" an apartment, "buy" a car, "furnish" their apartment, and "buy" appropriate interview attire all within the starting salary budget that came from a previous career project. The project forces them to make decisions about what is important to them and what they are willing to live without. Students are forced to analyze their own values and goals.”
- “In our Career unit, the students use technology throughout the whole unit. They do webquests, online scavenger hunts, research using the internet, create a PowerPoint presentation, and present their PowerPoint to the class.”

- “Life Resource Management For our housing unit the students had to research online to find living arrangements, and then set up a budget using the apartment they found and an income given to them.”
- “Consumer Mgmt--Budgeting--Using Excel”

Fashion Design/Clothing Construction

- “Fashion Design - Garment Line Design / Using Adobe Illustrator”
- “Advanced Fashion - Computerized pattern-making Students must design a garment, take their measurements, and use the information to take standard slopers and transform them into a pattern for their original design. They use Cochenille Design Studio's "Garment Designer" software, along with the reference and design manual. Students then construct the garment and finally, evaluate how well the final product matches the original design.”
- “Introduction to Fashion. They create a Professional Career Image Portfolio using the computer. Given a budget and a job that has specific dress code rules, they must create five outfits using the elements and principles of design to their body and stay within their budget. They more or less go fake shopping for these wardrobes noting the supplier and cost of each item. This project is also used in FCCLA competitions.”
- “A fashion research project using the internet to research different designers and colleges. The students then needed to create a presentation on the designer or school to present to the class.”

Fashion Merchandising

- “This lesson is in my highest level of Fashion - Students are required to create a url with their portfolio pictures for others to view and manipulate garments rotation. They are also required to do a cost analysis of their garments and what it would cost for the average consumer to buy. Much research, creativity, and time are devoted to this large undertaking.”

Foods/Culinary

- “Service Learning project requires students in Foods classes to research nutritional needs and problems of seniors. The students are then responsible to plan a nutritious snack that can be served at a nursing home facility that will meet nutritional needs as well as identify any special nutritional needs of some inhabitants. “Foods I: Students create a brochure, including 5 safety procedures, that can be use in home food preparation or within the food service industry.”
- “Professional Foods: We used a nutrition calculator program to analyze and advise outside adult "clients" to promote healthier living. The students were able to input and use data analyses to draw conclusions and draw up recommendations for their clients.”
- “In my best lesson I have used the internet for students to do research, and asked them to create a webpage using the research this was for a foods class.”
- “Creative Cooking 1 The USDA website for nutrition analysis. Students record what they ate for 2 or 3 days then enter it into the USDA

MyPyramid website, after which they analyze and evaluate their consumptions."

- "Nutrition Students create a healthy restaurant menu. Menu includes healthy meals they develop and a description of how/why meals are healthy and fit into a healthy eating plan. Menus are created on the computer."
- "Students are asked to create a presentation involving the history of cakes. They need to create either a song or a rap and use the information in a way that is not usually presented in."
- "Study of an international country to be presented in the classroom to peers. Quite a few steps of the process involve internet research as well as library databases."
- "Advanced Foods-Yeast experiments. Students need to analyze the reaction between yeast and several other ingredients. They must then decide which ingredients are necessary for the proper functioning of yeast."
- "The students input diets and analyze their nutrition using online software"
- "Health Occupations class - students use the smartboard to design fliers promoting hand washing at school - incorporate data/facts (such as % of high school students who wash their hands after using the washroom), attention getter, information source. We print the fliers & students post the fliers after strategizing the most effective placement"

- “Foods II: Students are given a recipe and required to gather all of the ingredients. They have to completely put the recipe together using the skills they have already learned in class. Students are evaluated by the finished product. Examples: Baked Alaska Cake”
- “create lesson plans, power points, investigate different countries, create pamphlets, etc. we do a lot. analyze meals for timing/pricing/taste”
- “In Pastry Arts, the students research how to change a cookie recipe using skills and knowledge learned in class. They create their own cookie recipe, write the recipe, then create the recipe.”
- “In foods 2 class I have the students keep track of their diet for one week. Before they begin I have them evaluate their eating happens and pick one thing they eat on a daily basis, be it pizza, chips, etc. They are asked to limit the amount of this food. At the end of the week the students are to analyze their diet and discuss their findings as a class.”
- “Restaurant Management - The students are responsible for planning and orchestrating a catering job. They have to design spreadsheets to organize the kitchen duties as well as the dining room staff. They must order their own recipes online and plan the entire menu.”
- “Eating Disorder Project Choice and Writing Assignment Introduction to Foods and Nutrition #1: Research an eating disorder and create a poster, or pamphlet, or presentation of research #2 Essay writing with self-evaluation of information that has had an impact during this unit. Graded with Illinois Writing Rubric.”

- “Students produce a purchase and inventory sheet for labs, analyzing the cost to make the item.”
- “In my advanced foods class, students expand their understanding of nutrition by acting as a nutrition counselor for an adult (of their choosing). They use MyPyramidtracker.gov to analyze information provided by their "client" and then evaluate the printouts. They use a variety of higher order thinking skills and additional research to develop a meaningful report which they word process for their client.”
- “Fitness & Nutrition course - Nutrition evaluation using computer program. Students analyze their specific information (dietary log and personal information) and then put together an evaluation piece on what they need to change according to the program and how they can change it in order to lead a healthier lifestyle.”
- “In Hospitality II the students used the Internet and Microsoft word to create their own restaurant. They were required to make a poster, draw how their restaurant would look from the inside, out, and write a paper describing their restaurant and why they chose the things they did in their restaurant. They need to take in consideration the front and back of the house, floor management, ect.”
- “[Through] an assignment given to my classes using the web to create recipes designed by them”
- “In my Nutrition & Fitness classes, my students are required to find media articles about nutrition. They write a summary of the article and have to

analyze if the information in the article they read is valid based on the nutritional principles they have learned in class. They need to be able to defend their point of view."

- "Students develop questions about GM corn and do research on the internet. Write conclusion and share."
- "Menu planning for a restaurant. Objective: Make a pamphlet that will promote your made-up restaurant....using publisher Aim: use of technology to promote customer attendance at your restaurant"
- "Lifestyle Fitness: Students logged what they ate over Thanksgiving weekend. We then input their consumption and activity on fitday.com and students analyzed their diets, exercise, dietary trends, and needs."

Generic

- "Child Development & Culinary Arts & ProStart -Have used this lesson in several classes. Good intro to any unit. Usually done with vocabulary but can be used for any key concepts. Child Development: Prenatal Terms Culinary Arts: Utensils/Culinary Terms ProStart: Foodservice Equipment Take students to computer lab. The day before each student signs up for a different vocabulary word for the unit. In the computer lab the students look up their word, its definition, and a picture of the word. They put that together on a PowerPoint slide. All the students save their slide to my flashdrive and I put their words in order to complete the presentation. The next day in the classroom, we have a PowerPoint presentation and they get to explain their word to the class. The only thing the teacher does is

come up with what words/concepts they want learned and make the title slide. Notes/Vocab=Done”

- “Power Point presentations followed by a review game done with technology.”
- “In my Adult Living, Psychology, and Parenting Classes I require my student to submit weekly blogs to my online class-discussion site with higher levels topics being discussed.”
- “For my classes the best lessons that use higher order thinking skills would be those which the students gather information and put it together into a presentation and teach others. Teaching is the best way to learn and having to go out and find their own information using technology amplifies this learning.”
- “I think my best lessons involving technology are based on students researching a topic, creating a Power Point presentation and brochure highlighting the key points of the topic and presenting the information to the class.”
- “The students do a comparison shopping project. They compare three things and are required to use the internet to do research. They are also required to use epinions or those types of sites to gather information. They then make an informed choice. This is all typed and turned in.”

Interior Design

- “Students are required to use the World Wide Web to research different housing styles and where they originated from. This is for Interior Design”

- “Interior Design Students select one of 3 homes. They draft the home and interior rooms to meet the needs of their family. They peer and teacher review to solve problem areas. They search the web for furniture and decorating samples and organize the information into a Word chart. They present the drafts and room by room decorating into a binder presentation for their final exam project.”
- Living Environments-students study architectural styles identifying characteristic details to identify the "influence" of varied styles of architecture.”

Introduction to Teaching

- “At the end of first semester in Introduction to Teaching the students prepare and present a lesson on a topic related to the field of education. The students are graded on the mechanics of the lesson which includes format, topic, use of technology and presentation.”

Life Studies/Family Living

- “Life Studies Students analyze their diets using a web program. It shows them their caloric intake, nutritive values and everything they need to know about foods they consume. They then take what they learn and write a paper using the web as their resource”
- “In the Sociology of Marriage and Family course, students must utilize information about birth order, heredity, family structure and personality characteristics to create a "Future Family Portfolio.” The students must utilize the internet as well as the course textbook to complete various

portions of the project. Students must create their 'future family' and explain if they want children, why or why not, how many, and how they will raise them based off their experiences growing up. They must also include what type of family they are a part of. They must also describe the role that they have in their family and what role they feel they will have in their future family."

- "Class: HERO Cooperative Education Students choose from four articles and write/type a summary into Microsoft word - upon completion they check the reading grade level - then return to their summary and utilize synonyms, revise incomplete sentences, combine sentences utilizing transitions - then recheck the reading grade level - revise as many times as they want within a given class period. Goal is to increase their writing ability. I also like using a wide range of tools in Microsoft word or publisher to create an ad for their place of business."
- "Learning parts of the brain for psychology/family living. Research using the Internet, label diagrams, fill in chart about part and function, actually make a brain and label parts using food."

Parenting

- "Parenting Students take Baby-Think-It-Over home and care for it for 3 days and 2 nights. They must type summary of events that took place, reflect on their experience, and decide if they are ready to parent."
- "My students do a Web Quest on meeting the nutritional needs of pregnancy. Prior to the quest, nutritional guidelines are covered. I use the

University of Illinois NATS system, which requires the student to design a diet for a pregnant female, aged 19-30. The system will analyze their choices and they must analyze where they succeeded and where they are deficient. Another favorite activity, (you can choose the better!) is after a week of "Reality Parenthood" where new parents speak on the physical, social/emotional, educational and financial challenges of parenthood, (and newborn and OB nurses present), the students design a brochure in Publisher sharing their information for peer review. The brochures are placed in our nurses' office."

- "My students develop a public service announcement of FAS. They search the internet and other professional journals online and develop a public service announcement. They also search the internet for examples, etc."

Listed By Higher Order Thinking Skill(s)

Analysis

- "consumer Education budget unit They use the computer to present their project with a power point. they research using websites for housing, cars, renter's insurance, budget packages, comparison food prices, clothing, etc. The students develop interactive activities for the class when they teach it. Their tests are done on the computer and put in a dropbox."
- "Stock market project students have to use the web, excel, and word to create, analyze, and predict future outcomes in the stock market. This is for consumer management"

- “Life Studies Students analyze their diets using a web program. It shows them their caloric intake, nutritive values and everything they need to know about foods they consume. They then take what they learn and write a paper using the web as their resource”
- “Students are required to use the World Wide Web to research different housing styles and where they originated from. This is for Interior Design”
- “Fashion Design - Garment Line Design / Using Adobe Illustrator”
- “In Practicum in Early Childhood Education, I created a webquest where students are given the assignment of a substitute preschool teacher. They have to find 3 activities on the web that deal with 3 different curriculum areas and are about a specific theme.”
- “Advanced Foods-Yeast experiments. Students need to analyze the reaction between yeast and several other ingredients. They must then decide which ingredients are necessary for the proper functioning of yeast.”
- “Consumer Management. Putting together a Stock Portfolio, by researching different companies on the NYSE”
- “Class: HERO Cooperative Education Students choose from four articles and write/type a summary into Microsoft word - upon completion they check the reading grade level - then return to their summary and utilize synonyms, revise incomplete sentences, combine sentences utilizing transitions - then recheck the reading grade level - revise as many times as they want within a given class period. Goal is to increase their

writing ability. I also like using a wide range of tools in Microsoft word or publisher to create an ad for their place of business."

- "Students produce a purchase and inventory sheet for labs, analyzing the cost to make the item."
- "In my Nutrition & Fitness classes, my students are required to find media articles about nutrition. They write a summary of the article and have to analyze if the information in the article they read is valid based on the nutritional principles they have learned in class. They need to be able to defend their point of view."
- "Selection of suitable child care Advanced Child Development Challenge student to make suitable choice related to profile of assigned child."
- "Lifestyle Fitness: Students logged what they ate over Thanksgiving weekend. We then input their consumption and activity on fitday.com and students analyzed their diets, exercise, dietary trends and needs."
- Living Environments-students study architectural styles identifying characteristic details to identify the "influence" of varied styles of architecture."

Synthesis

- "Child Development and Parenting The students had to research certain STDS on websites that were provided. They had to research in groups with each assigned to a specific task. Once they were finished, they had to

create a PowerPoint, save it to a shared drive and then present it. It is a great project and I have been doing this one for 3 years."

- "Service Learning project requires students in Foods classes to research nutritional needs and problems of seniors. The students are then responsible to plan a nutritious snack that can be served at a nursing home facility that will meet nutritional needs as well as identify any special nutritional needs of some inhabitants.
- "Foods I: Students create a brochure, including 5 safety procedures, that can be use in home food preparation or within the food service industry."
- "In my best lesson I have used the internet for students to do research, and asked them to create a webpage using the research this was for a foods class."
- "Nutrition Students create a healthy restaurant menu. Menu includes healthy meals they develop and a description of how/why meals are healthy and fit into a healthy eating plan. Menus are created on the computer."
- "Power Point presentations followed by a review game done with technology."
- "Students are asked to create a presentation involving the history of cakes. They need to create either a song or a rap and use the information in a way that is not usually presented in."

- “Study of an international country to be presented in the classroom to peers. Quite a few steps of the process involve internet research as well as library databases.”
- “Foods II: Students are given a recipe and required to gather all of the ingredients. They have to completely put the recipe together using the skills they have already learned in class. Students are evaluated by the finished product. Examples: Baked Alaska Cake”
- “In an advanced child development course my students create a brochure for parents.”
- “My students do a Web Quest on meeting the nutritional needs of pregnancy. Prior to the quest, nutritional guidelines are covered. I use the University of Illinois NATS system, which requires the student to design a diet for a pregnant female, aged 19-30. The system will analyze their choices and they must analyze where they succeeded and where they are deficient. Another favorite activity, (you can choose the better!) is after a week of "Reality Parenthood" where new parents speak on the physical, social/emotional, educational and financial challenges of parenthood, (and newborn and OB nurses present), the students design a brochure in Publisher sharing their information for peer review. The brochures are placed in our nurses' office.”
- “My students develop a public service announcement of FAS. They search the internet and other professional journals online and develop a public service announcement. They also search the internet for examples, etc.”

- “Restaurant Management - The students are responsible for planning and orchestrating a catering job. They have to design spreadsheets to organize the kitchen duties as well as the dining room staff. They must order their own recipes online and plan the entire menu.”
- “At the end of first semester in Introduction to Teaching the students prepare and present a lesson on a topic related to the field of education. The students are graded on the mechanics of the lesson which includes format, topic, use of technology and presentation.”
- “For my classes the best lessons that use higher order thinking skills would be those which the students gather information and put it together into a presentation and teach others. Teaching is the best way to learn and having to go out and find their own information using technology amplifies this learning.”
- “Eating Disorder Project Choice and Writing Assignment Introduction to Foods and Nutrition #1: Research an eating disorder and create a poster, or pamphlet, or presentation of research #2 Essay writing with self-evaluation of information that has had an impact during this unit. Graded with Illinois Writing Rubric.”
- “child development students planned a preschool day using internet resourced activities”
- “In Hospitality II the students used the internet and Microsoft word to create their own restaurant. They were required to make a poster, draw how their restaurant would look from the inside, out, and write a paper

describing their restaurant and why they chose the things they did in their restaurant. They need to take in consideration the front and back of the house, floor management, ect."

- "[through] an assignment given to my classes using the web to create recipes designed by them"
- "In our Career unit, the students use technology throughout the whole unit. They do webquests, online scavenger hunts, research using the internet, create a PowerPoint presentation, and present their PowerPoint to the class."
- "Life Resource Management For our housing unit the students had to research online to find living arrangements, and then set up a budget using the apartment they found and an income given to them."
- "Consumer Mgmt--Budgeting--Using Excel"
- "A fashion research project using the internet to research different"
- "Students develop questions about GM corn and do research on the internet. Write conclusion and share."
- "Menu planning for a restaurant. Objective: Make a pamphlet that will promote your made-up restaurant....using publisher Aim: use of technology to promote customer attendance at your restaurant"

Evaluation

- "The students work on a real life project in Consumer Management. At the end of the project, they use an excel spreadsheet to see how much money they have spent in a budget for a month."

- “Consumer Economics. Evaluating available credit and loan choices.”
- “Consumer Education Class: Using Excel to show the calculation of compounding interest over time (44 years).”
- “Parenting Students take Baby-Think-It-Over home and care for it for 3 days and 2 nights. They must type summary of events that took place, reflect on their experience, and decide if they are ready to parent.”
- “Consumer education: we evaluate different rental homes and homes to purchase. The students look at their needs and wants and evaluate what would be a good rental unit”
- “In my Adult Living, Psychology, and Parenting Classes I require my student to submit weekly blogs to my online class-discussion site with higher levels topics being discussed.”

Analysis, Synthesis, and Evaluation

- “Child Development, the students have to design their own child care facility using Word, scanners, PowerPoint, Publisher, all of Microsoft office, and digital cameras and video. Also provide a bi-weekly newsletter for the parents using the same technology tools.”
- “Child Development II: Students create a lesson plan including activities that they research on the Internet for age-appropriate use in a student-led playschool.”
- “Advanced Fashion - Computerized pattern-making Students must design a garment, take their measurements, and use the information to take standard slopers and transform them into a pattern for their original

design. They use Cochenille Design Studio's "Garment Designer" software, along with the reference and design manual. Students then construct the garment and finally, evaluate how well the final product matches the original design."

- "Real World Project Students are required to "rent" an apartment, "buy" a car, "furnish" their apartment, and "buy" appropriate interview attire all within the starting salary budget that came from a previous career project. The project forces them to make decisions about what is important to them and what they are willing to live without. Students are forced to analyze their own values and goals."

Synthesis and Evaluation

- "Early Childhood Education utilizes many technology skills when putting together a 100 page portfolio"
- "Consumer Education, Students used the Internet to find information about potential automobiles they would like to buy. They then analyzed which car they could afford, why it would be good for them, and how they could lower the price. It was then put into a PowerPoint presentation and shown to the class."
- "Students create a lesson plan for a specific curricular area to teach three and four-year-old preschoolers. Students must use at least 3 resources (can be internet sites) to create their lesson. Students evaluate the age-appropriateness and practicality of the lesson plan ideas when creating their own lessons."

- “Health Occupations class - students use the smartboard to design fliers promoting handwashing at school - incorporate data/facts (such as % of high school students who wash their hands after using the washroom), attention getter, infor [information] source. We print the fliers & students post the fliers after strategizing the most effective placement”
- “My students in my preschool lab create a case study power point presentation on a particular child. The students evaluate the child's different areas of development and compile the information into a presentation which they then present in a parent conference.”
- “The students do a comparison shopping project. They compare 3 things and are required to use the internet to do research. They are also required to use epinions or those types of sites to gather information. They then make an informed choice. This is all typed and turned in.”

Analysis and Synthesis

- “Consumers education: selection of housing in the area they need to calculate and figure cost to purchase a mortgage they need to select financial institutions in the area and compare them with reference to point, interest rates, down payments, difference in rates according to length of the term. They then need to present a power point presentation”
- “In consumer education, students research careers, prepare a budget based on the careers, find an apartment on line etc.”
- “create lesson plans, power points, investigate different countries, create pamphlets, etc. we do a lot. analyze meals for timing/pricing/taste”

- “In the Sociology of Marriage and Family course, students must utilize information about birth order, heredity, family structure and personality characteristics to create a "Future Family Portfolio.” The students must utilize the internet as well as the course textbook to complete various portions of the project. Students must create their 'future family' and explain if they want children, why or why not, how many, and how they will raise them based off their experiences growing up. They must also include what type of family they are a part of. They must also describe the role that they have in their family and what role they feel they will have in their future family.”
- “Learning parts of the brain for psychology/family living. Research using the Internet, label diagrams, fill in chart about part and function, actually make a brain and label parts using food.”
- “The Baby Think It Over project requires students to analyze their life and how a baby would influence it. The project requires students to evaluate how a baby would change their lives.”
- “Interior Design Students select one of 3 homes. They draft the home and interior rooms to meet the needs of their family. They peer and teacher review to solve problem areas. They search the web for furniture and decorating samples and organize the information into a Word chart. They present the drafts and room by room decorating into a binder presentation for their final exam project.”

- “I think my best lessons involving technology are based on students researching a topic, creating a Power Point presentation and brochure highlighting the key points of the topic and presenting the information to the class.”
- “This lesson is in my highest level of Fashion - Students are required to create a url with their portfolio pictures for others to view and manipulate garments rotation. They are also required to do a cost analysis of their garments and what it would cost for the average consumer to buy. Much research, creativity, and time are devoted to this large undertaking.”

Analysis and Evaluation

- “Child Development TO SPANK, OR NOT TO SPANK? Students are asked to take a stance on the controversial topic of spanking and defend their position. They are required to research and obtain credible information. Our media center specialist provides support and assistance during computer lab time.”
- “Professional Foods: We used a nutrition calculator program to analyze and advise outside adult "clients" to promote healthier living. The students were able to input and use data analyses to draw conclusions and draw up recommendations for their clients.”
- “Creative Cooking 1 The USDA website for nutrition analysis. Students record what they ate for 2 or 3 days then enter it into the USDA MyPyamid website, after which they analyze and evaluate their consumptions.”

- “Introduction to Fashion. They create a Professional Career Image Portfolio using the computer. Given a budget and a job that has specific dress code rules, they must create five outfits using the elements and principles of design to their body and stay within their budget. They more or less go fake shopping for these wardrobes noting the supplier and cost of each item. This project is also used in FCCLA competitions.” [Family, Career, and Community Leaders of America]
- “Child Care: Baby Think It Over Simulator -Students will use the BTIO software (sheet produced by teacher) to analyze the percentage data. They will find the averages, medians, modes range, as well as the incorporation of graphs. This will help students determine their position, based on care percentage, out of all the students taking home the infant simulator.”
- “In Pastry Arts, the students research how to change a cookie recipe using skills and knowledge learned in class. They create their own cookie recipe, write the recipe then create the recipe.”
- “In foods 2 class I have the students keep track of their diet for one week. Before they begin I have them evaluate their eating happens and pick one thing they eat on a daily basis, be it pizza, chips, etc. They are asked to limit the amount of this food. At the end of the week the students are to analyze their diet and discuss their findings as a class.”
- “In my advanced foods class, students expand their understanding of nutrition by acting as a nutrition counselor for an adult (of their choosing).

They use MyPyramidtracker.gov to analyze information provided by their "client" and then evaluate the printouts. They use a variety of higher order thinking skills and additional research to develop a meaningful report which they word process for their client."

- "In Child Day Care Occupations the students test the preschooler's abilities and put together a professional letter. This letter discusses the preschooler's abilities, likes/dislikes etc in order to educate the parents on their child's readiness for kindergarten. They also give the parents suggestions of activities the parents can do at home to help the child improve their skills. I do allow 4 preschool days for the children to test the preschooler's abilities."

Appendix F: Lesson Plan Web Site

Appendix F: Lesson Plan Web Site

http://sites.google.com/site/familyconsumerscienceslessons/

Family Consumer Sciences Technology Lesson Plans

Hello and welcome to my web site!

My name is Beth Hirose and I am a family consumer sciences teacher at Round Lake High School in Illinois and am currently working on my dissertation as well as National Board Certification.

This site was created to share lesson plans from family consumer sciences teachers. Each lesson plan uses technology in some way and requires students to use higher order thinking skills according to Bloom's taxonomy. The lesson plans were obtained through my dissertation, "Family Consumer Sciences Teachers' Use Of Technology To Teach Higher Order Thinking Skills." I will defend my dissertation this July, 2009. All participants in the survey were made aware that their submitted lesson plans may be published online for others to use.

I researched what other family consumer sciences teachers were doing in regards to technology because there are limited resources for us online in terms of lesson plans. I wanted to create a source of ideas for my fellow colleagues to use so that we might expand our student's learning opportunities. Please feel free to use any of the ideas listed. The lessons are categorized by both course and by higher order thinking skill. If you have any questions or comments about the content of this site you may contact me at bhirose@rlas-116.org.

(Lesson plans have been transcribed for the most part as they were given to me. I included lessons that combined family consumer sciences, technology, and one or more higher level thinking skill- Analysis, Synthesis, and/or Evaluation. Duplicate or incomplete lessons were not included.)

Listed By Course

Child Care/Child Development

'Child Development and Parenting, The students had to research certain STDS on websites that were provided. They had to research in groups with each assigned to a specific task. Once they were finished, they had to create a PowerPoint, save it to a shared drive and then present it. It is a great project and I have been doing this one for 3 years."

'Child Development, the students have to design their own child care facility using Word, scanners, PowerPoint, Publisher, all of Microsoft office, and digital cameras and video. Also provide a bi-weekly newsletter for the parents using the same technology tools."

Continued online…