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## EXAMINING STUDENT ACHIEVEMENT AND MOTIVATION USING INTERNET-BASED INQUIRY IN THE CLASSROOM

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EXAMINING STUDENT ACHIEVEMENT AND MOTIVATION USING INTERNET-  
BASED INQUIRY IN THE CLASSROOM

by

Julie M. Lokie

A THESIS

Presented to the Faculty of  
The Graduate College at the University of Nebraska  
In Partial Fulfillment of Requirements  
For the Degree of Master of Science  
Major: Child, Youth and Family Studies

Under the Supervision of Professor Julie M. Johnson

Lincoln, Nebraska

May 2011

EXAMINING STUDENT ACHIEVEMENT AND MOTIVATION USING INTERNET-  
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University of Nebraska, 2011

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The purpose of the pilot study was to compare middle school Family and Consumer Science student achievement and motivation in a classroom using Internet based inquiry to the achievement and motivation of students without the use of Internet based inquiry. The control group had 37 students and the experimental group had 21 students participate in the study. Each group was taught a two-week lesson on child growth and development. The control group was taught with a conventional, teacher-directed, method using textbooks and worksheets. The experimental group was taught with computers and an Internet based inquiry method. Students in each group were given the same pre-test and post-test to compare achievement. Students and teachers completed a survey to give perceptions of the level of motivation with the teaching strategy they experienced. Questions used words students would understand related to motivation.

Student achievement increased in both groups as indicated by higher post-test scores. The control group increased their achievement significantly based on a pairwise comparison. The experimental group increased their achievement but this was not

statistically significant. Results of the teacher survey found that teachers felt students learned the content being taught regardless of teaching method and they perceived that student engagement was affected by the teaching method used. The student survey findings showed a significant difference between the control groups and the experimental group in their engagement of learning and preference of learning modality based on a t-test.

Because it appears students may be motivated by technology, perhaps teachers may find it useful in the classroom. It is a tool that could help teachers plan lessons that are interactive, current, relevant and real, and therefore, may be motivating to students. If students are motivated and focused on the lessons, then their opportunity for learning and achievement may increase.

### ACKNOWLEDGEMENTS

To all my friends and family who have encouraged me in this process, I am very thankful. A very special thanks to Dr. Julie M. Johnson, my adviser, who guided me throughout this project. Her encouragement and assistance were always welcomed and greatly appreciated. Thank you to my graduate committee, Dr. Kathy Prohaska-Cue and Dr. Michelle Rupiper for your expertise and suggestions.

J.M.L.

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## CHAPTER ONE

### Introduction

At the end of the school day, I observe middle school students transform from students in my classroom to private citizens. Cell phones and Mp3 players appear becoming extensions of the student. Technology comes easily and naturally for these students. Does this comfort with technology translate to using it in the classroom, and furthermore, do teachers use technology to motivate students and to promote their achievement?

Technology as defined by Norton (1984), is the system of tools, skills and knowledge used to make things or perform activities. It includes both physical and intangible skills and the knowledge to use them. Technology is present in many forms in our society today from computers to cell phones; knowing how to use technology has become mandatory for success. Helping children succeed in their future work and personal life is a goal of education. Teachers should help students use the technology available, particularly if it increases their achievement in school and motivates them to learn.

Students use the new technology. They like it and it appears they are motivated by it. Since students are comfortable using technology, it may be an avenue for increasing their achievement. Can teachers use it to enhance their learning and stimulate their interest?

There are many types of technology available to teachers, including computers and software, Internet, DVD players, digital cameras, computer projectors, smart boards, document camera, Mp3 players and e-book readers. These tools are available and are being used, but are they helping students learn?

### *Statement of the Problem*

Teachers continually strive to find the best strategies to facilitate student learning and achievement. We live in a changing technological society and as society changes so do students. As students become more adept at using technology, they expect to use these new technologies but will technology help them learn the concepts presented?

As we have mainstreamed technology into our culture there has been a shift in control of information from experts to the consumers (Smith, 1999). Today a larger portion of the population can find information quickly and easily through access to the Internet. Consumers want to know now. We carry cell phones so we can communicate with anyone, anytime, and we want to download information from the Internet instantly. This is especially true for students today. Students today are part of a new generation that has been called Millennials, Digital Natives by Prensky, (2010) and the Net Generation by Tapscott, (2009). They are technologically enhanced and connected to one another 24/7 (Prensky, 2010). Young people use the Internet for communicating with other people-chat, email and instant messaging. Social network use has been growing (Jones, 2009). One of the eight Net Generation Norms in Tapscott's book, *Grown Up Digital* (2009) states that the Net Generation has a need for speed. Instant messaging,

texting and tweeting are all forms of real time communication. The consumers of today expect instant information whether it is personal communication, business related or news of their neighborhood or around the globe.

Technology is transforming our society (Tapscott, 2009). In Barak Obama's 2008 presidential election, technology was used to alter this important political process. Using a social networking site, a community of over one million young people who are part of the net generation, was created. The Internet gave these supporters information and the opportunity to organize themselves. This changed the course of Obama's bid for president from underdog to front-runner. Technology gave information and freedom to these young people and motivated them to become involved.

Educators need to consider this paradigm shift when planning and presenting lessons. Technology shouldn't be used just for the sake of using technology. It should have a purpose to enhance the learning process and student achievement. The purpose of this study was to compare middle school Family and Consumer Science (FCS) student achievement and motivation in a classroom using Internet based inquiry (Web Quest, a technological tool) to the achievement and motivation of students without the use of Internet based inquiry.

### *Research Questions*

1. To what extent do middle school students achieve higher scores on content knowledge when using Internet based inquiry (Web Quest) than when they do not use this tool?

2. To what extent does Internet based inquiry (Web Quest) motivate the engagement of middle level students?

### *Educational Issues Related to Technology*

Historically there have been educational issues related to technology at the district level and in the classroom. As technology, such as computers, became more common in schools, questions were raised. Does the school district have a technology plan and provide assistance for teachers (Goldman, 1999)? Does the teacher's instructional philosophy and practice lend itself to the use of technology and will it help achieve the goal of student learning? What type of hardware and software are available? What are students' attitudes about using technology (Ehrmann, 1999)? Today we have added the questions of how much access should we give students, how should we deal with cyber-bullying, academic misconduct and student privacy (Heath, 2008). It is a challenge to keep students on school approved web sites. Personal technological devices such as cell phones and ipods that have Internet capability are in the hands of students. These can be disruptive to the education process and are disallowed in many schools. Pressure from the community and parents is changing this policy across the country. These devices have cameras that can be used to cheat on tests or take inappropriate pictures of classmates without their knowledge. Answers to these questions will utilize the available lines of communication to students and parents and to have well defined technology policies

One major issue to be addressed is if technology helps student achievement. Studies have shown the use of computers helps students with learning disabilities and

those for whom English is not their first language (Burgess, 2009; Chang, 2010; Ehrmann, 1999; Higgins et al, 1996; and MacArthur, 1996). Using technology in the classroom requires teachers to change methods and rethink the lesson plans they are using to allow for changes in time and materials. If this causes anxiety or the hesitation to change, then the use of technology may be inhibited. Teachers need to have basic training for technology they plan to use. They need to practice using this technology before they are skilled enough to use it in their teaching. Teachers need time to plan, time to implement their plans and time to assess student learning. There is little time left to spend learning to use technology effectively. Teachers routinely use technology for things such as grading, attendance and graphic organizers. The more they become familiar with technology, the more interest they will have in using technology in their lessons. There is an abundance of software that can facilitate teaching and learning. When teachers know what is possible, they are more likely to include advanced technology such as wikis, blogs or Internet research in their teaching.

#### *Definition of Terms*

**Technology-** electronic tools used in the school.

**Web Quest-** an inquiry-oriented activity in which some or all of the information that learners interact with comes from resources on the Internet.

**Internet-** a global network connecting millions of computers. More than 100 countries are linked into exchanges of data, news and opinions.

**Achievement-** student progress based on test scores related to curriculum content.

**Motivation-** desire to engage in an activity out of curiosity, interest, or enjoyment.

### *Assumptions*

For the purpose of this pilot study, the following assumptions were made:

1. The persons facilitating the curriculum related to the study will be FCS teachers who are familiar with content and the technology used and will be able to accurately record their perceptions of the differences in student motivation.
2. The students in each classroom have equal or similar levels of inherent intelligence and motivation.
3. Comparisons can be made of pre and post-test scores of content taught with and without Internet based inquiry (Web Quest).
4. Surveys used to measure teacher and student perceptions of Internet based inquiry (Web Quest) use on motivation will be reliable and valid.

### *Limitations*

This pilot study was limited in the following respects:

1. As a pilot study, the research was limited by the small number of classrooms used in the study. Only two classrooms were used.
2. The researcher participated in the study as one of the teachers comparing student achievement and motivation. This could introduce bias.
3. This study was subject to those weaknesses inherent in research using a self-report questionnaire.
4. This study was limited by the abilities and diversity of the student subjects.

5. Results of this study can't be generalized to all technology tools because one specific technological tool, Internet based inquiry (Web Quest), was used.
6. This study was limited by the differences in ages and experience of teachers participating.

### *Significance of the Study*

Because technology can be used as a teaching tool, it would be beneficial to determine if it increases achievement and motivation in students. Technology should not be used just for technology sake; it should have a purpose related to student achievement and/or motivation. No studies have been found to compare student achievement and motivation in an FCS classroom using technology to achievement and motivation without using technology. A comparison will be provided by this research.

If technology motivates students or raises achievement, this information will be useful to FCS teachers. If it raises the achievement or motivation, teachers could modify their instructional practices and use the results to justify technology purchases for FCS classrooms. Administrators may be more apt to approve technology purchases if they have evidence that the use of technology will raise student achievement.



## CHAPTER TWO

### Review of Literature

This review of literature will examine (1) today's learners, (2) educational technology and Internet usage in the classroom and (3) the relationship between achievement, motivation and educational technology.

Technology is used everywhere to gather information, keep records, create multimedia presentations, social networking, collaboration and life-long learning. Its use in all areas and stages of life makes it imperative that educators consider its use in the educational process. Can it be used as a tool to help students become engaged in learning and increase their achievement?

#### *Today's Learners*

Every generation has been given a name. They are defined by time and common experiences. The Baby Boomers were born between 1946 and 1964 and shared social changes and prosperity. Today's learners, the children of the younger Baby Boomers, are called Millennial's. In both his books *Growing up Digital* (1998) and *Grown up Digital* (2009), Tapscott called these children of the baby-boom generation the "Net Generation". They were born between 1979 and 2000 and their common experience is technology. Today's middle school students are part of the Millennial generation. Middle level students are aptly named. They are in the middle, between childhood and the teen years. This time in their life is characterized by change. Physical, emotional, social and

intellectual changes are occurring all at the same time. They have grown up surrounded by technology. Technology is being used extensively by youth in our society. Sherry (2005) found in a study of Millennial's that 91% had access to computers and feel confident in their ability to use them. They are spending more time on-line and easily learn new technologies. Interactive media that provides a way to have two-way conversations with others is preferred over viewing television, reading or any other one-way method of communicating concepts. Students use Internet for coursework, looking up information on the web and downloading music, software and movies, job searching, shopping and games. The Internet is their preferred medium for social interaction via social network sites like Facebook, My Space and Twitter (Jones, 2009).

In the classroom many in this generation appear to have a short attention span. In his book *Teaching Digital Natives*, Prensky (2010) debates this lack of attention. He points to their ability to sit for hours watching movies, playing video games or sitting in front of a computer looking at things on the Internet. The same students that can't concentrate in class will use after school time to work with computers and the Internet and develop skills that will be useful to them in the future. The traditional classroom where teachers are the main source of information will not keep students engaged in the learning process. According to Tapscott (1998), students who are not engaged will not achieve.

So what do these students want? Today's learners want to learn differently than they have in the past. Both Prensky (2010) and Tapscott (2009) believe they want to

collaborate. Their peers have a wealth of information and they utilize the Internet to share that information. Tapscott (2009) feels students want choices in learning activities.

Following their interests and passions is important to them. Reaching this group on an academic level is not an easy task. They need curriculum that is relevant and motivating. Using technology in the classroom may be a way to make learning both relevant and motivating. Most middle level students have grown up with technology and enjoy using it. If they enjoy the lessons taught using technology, they may be engaged in the learning process and achievement may improve.

#### *Educational technology and Internet usage in the classroom*

Teachers are using educational technology and the Internet in their classrooms and in their curriculum. The more teachers use technology, the more comfortable they become. The more comfortable they are with technology, the more likely they will incorporate it into their curriculum. The question should always be, is it beneficial to students for learning? For technology or the Internet to be useful tools for learning, teachers should keep class sizes small, make it individualized and utilize peer learning so students interact with other students (Bork, 2001).

Croxall (2000) examined the use of computers and the Internet by FCS teachers in New Mexico. Results found most FCS teachers had a computer in the classroom but it was not a newer model. Internet was used by 27% of the teachers, monthly. Those not using Internet, about half, stated lack of the ability to connect to the Internet as the main reason. Teachers described computers being used by their students for writing papers,

utilizing Internet resources, and conducting research. Computers were utilized most in foods and nutrition and child development. The amount of training teachers reported varied. Some had extensive training while many indicated a need for additional training especially in using it for teaching. Manley (2000) investigated how FCS educators used the Internet. Results indicated most FCS educators used the Internet. The researchers felt this was important in keeping FCS education relevant.

The Internet is being used but how do teachers feel about its value and usefulness? A study by Harrison (2000) reported the value and usefulness of technology to FCS teachers in Louisiana. Results from a questionnaire indicated teachers place a high value on using technology for instruction. The teachers specified that technology was moderately useful in management, planning and evaluation. Slightly more than half of these teachers' schools were connected to the Internet.

Technology, such as the Internet, can be a resource to FCS teachers. Friesen (2001) found many websites related to foods and nutrition to be reliable. The websites were organized into seven different categories (see Figure 1). In each category websites were listed and their content was summarized. This information helps teachers find and utilize up-to-date nutrition information from these websites to enrich the teaching of nutrition.

- 
1. Nutrition Reference Materials
  2. Diet Analysis and Energy Calculation Programs
  3. Nutrient Resources
  4. Sports Nutrition
  5. Eating Disorders/Weight Control
  6. Food Safety
  7. Foods Information
- 

**Figure 2.1** Website Categories for Foods and Nutrition Educators, Friesen (2001).

Financial education is becoming an even more important part of FCS education in light of the recent recession that has affected so many families. So how could technology be used to help teach students financial literacy? In a study by Lucey (2007) educators felt technology would be of value to financial education. This result came from educator's answers in agreement to hypothetical questions related to the implementation of a financial education program.

McFadden (2001) reported many Internet applications useful in FCS classrooms, including content-related websites and FCS organization websites. McFadden also examined Internet tools available to teachers, for example, programs for generating tests and puzzles and video streaming sites, expanding the classroom to anywhere in world. In conclusion, McFadden found the use of the computer and Internet is important to help students be ready for their futures.

Keane (2002) looked at ways technology has impacted the field of Family and Consumer Science over the past 20 years and implications for the FCS classroom. Historically FCS classrooms have welcomed new technology in appliances for the

kitchens such as the latest models with computer programming and innovations like the microwave. In the mid 1980's the professional association recommended to FCS teachers to embrace technology and use it in their instruction of students. Teachers started by educating students in the importance of technology and moved to incorporating technology into curriculum in different areas, such as foods and nutrition, housing and interiors, and consumer education. The research suggests even if the availability of technology is limited, it can still be utilized to enhance lessons through presentations, group research or use of specific software programs.

Reichelt (2008) found every area of FCS had information on the Web, which could be used to create curriculum. Reichelt provided a list of resources to help teachers find ways to utilize the Internet including the following:

- Sites for helping teachers integrate technology into curriculum
- Sites specific to FCS content
- Communication tools
- Evaluation tools

These tools can be used to engage students and may improve their achievement.

MacArthur (1996) reviewed the technology available to aid students with learning disabilities. Software was available to help students with the process of writing such as outlining, spelling, grammar, and word prediction. These students, to communicate and collaborate with a wide variety of people, can also use the Internet. These studies present a good case for the usefulness of educational technology and the Internet.

*The relationship between achievement, motivation and educational technology*

The relationship between technology, achievement and motivation is seen clearly in the story of Mark Zuckerman, creator of Facebook, a social networking web site. In the early stages of Facebook Zuckerman was a student at Harvard. He was so involved in the creation of the social networking site that he was not attending classes and was not ready for an art history exam. He used the Facebook site to post pictures of the art that was to be on the exam and had his classmates add information to each picture. The result of this study method was that all the students in the class passed the test, including Zuckerman. Engagement and motivation by using technology is what helped these students achieve. They were engaged and motivated by the technology that was available to them and they improved their achievement.

The purpose of education is for students to learn. Learning can be measured by achievement. Achievement in the classroom can be measured by student progress based on test scores related to curriculum content. For students to learn there needs to be a level of motivation. Motivation can be defined as a desire to engage in an activity out of curiosity, interest, or enjoyment. Students are motivated by technology. If technology is to be used to keep students motivated and therefore help them achieve, teachers and students need access to it. According to the U.S. Department of Education, National Center for Education Statistics (2006) by 2005 nearly 100% of schools and 94% of classrooms had Internet access; 45% of schools had wireless Internet connections. When the student to computer with Internet access ratio was first measured in 1998, there were

12.1 students to every computer with Internet access. In 2003 it had changed to 4.4 students for every computer. The most recent statistic shows a further improvement where the number of students to computers with Internet access is now 3.8 to 1. The access is available and needs to be used if it can engage students and help them achieve.

The traditional method of teaching is the broadcast method also known as the “sage on the stage”. It is difficult to be certain that all students are engaged in the learning process or motivated to learn when this is the primary method of teaching. Tapscott (1998) listed eight areas (see Figure 2) where using technology will help teachers change from the broadcast method to an interactive method of teaching. Using this method, it is easy to assess student engagement in the learning process (pp. 142-148).

<b><u>Broadcast Learning</u></b>	<b><u>Interactive Learning</u></b>
Linear	Hypermedia Learning
Instruction	Construction/Discovery
Teacher-Centered	Learner-Centered
Absorbing Materials	Learning how to
School	Lifelong
One size fits all	Customized
School as torture	School as fun
Teacher as transmitter	Teacher as facilitator

**Figure 2.2** The shift from Broadcast to Interactive Learning, Tapscott (1998).

Tapscott describes these changes in the following ways.

1. From linear to hypermedia learning.

Traditional teaching is linear. Using textbooks and instructional videos are linear; they are designed to be taught from beginning to end. Students today



are non-sequential; they multi-task. Hypermedia learning is set up like a web with a hub and spokes that interconnect. This technology makes moving in non-sequential order easy.

2. From instruction to construction and discovery.

Students may learn best if they discover the information or construct new knowledge themselves rather than being told what they need to know. Search engines and websites are a good way for students to discover information.

3. From teacher-centered to learner-centered education.

Teachers need to take into account the learner's abilities and their style of learning rather than the teachers' interests. Students today like to use technology and may be engaged in learning when using it.

4. From absorbing material to learning how to navigate and how to learn.

Students today may learn best if they can think for themselves and learn how to learn. Giving facts and figures to repeat back may not engage them and they may not learn.

5. From school to lifelong learning.

Baby-boomers expected to learn their occupation and continue it the rest of their lives. Today's students will need to keep learning because their occupations will keep changing. Technology may help them in this endeavor.

6. From one-size-fits-all to customized learning.

The industrial revolution had an influence on the educational system. Mass production and assembly line mentality led to the idea of one method of education for everyone. Students adjust to the teacher. Today teachers and students can utilize technology and individualize some aspects of the learning process.

7. From learning as torture to learning as fun.

Some students view school as torture or at least not something they look forward to. Students with learning or behavior challenges don't enjoy school because they have negative experiences with other students, teachers and administrators. Giving them the opportunity to use technology in the classroom, may give them something enjoyable and challenging. Also it is a way to connect in a more positive way.

8. From the teacher as transmitter to the teacher as facilitator.

Many students today don't respond well to the "sage on the stage" approach of traditional teachers. To engage these students the teacher needs to act as a facilitator. She/he needs to help them find information and assist them in constructing their knowledge of important concepts. Technology like the Internet may be the perfect place to seek information and create new knowledge.

Shifting from the broadcast method to using technology gives students a chance to show initiative, and creativity and may make learning fun especially for middle level students. Books, worksheets or other written assignments may help students learn the concepts presented but technology may be more motivating. When students have a positive attitude toward learning, they spend more time studying the concepts, and this may improve their achievement.

New teachers are challenged by inexperience when it comes to developing engaging lessons that meet standards and produce student achievement. Teacher educators see the need to teach prospective teachers how to address the issue of student engagement through the use of technology. Marks (2008) found that pre-service teachers level of fear about using technology in the classroom was less when these students were experienced with technology and were confident in their ability to incorporate technology into their classrooms. Through a review of literature, Mosenson and Johnson (2008) have two recommendations for pre-service teacher programs in regards to the pre-service teachers: (1) show students how to use technology through relevant examples of activities that can be used in the classroom, and (2) help students feel capable of utilizing the technology available. If new teachers don't have concrete examples of how to use technology or the confidence in their ability before they have their own classroom then they may not have time to plan engaging lessons using technology when they start working as a teacher.

There are effective ways teachers can use the Internet to motivate students and help them learn. One way is to use a Web Quest. A Web Quest is a learning tool that is defined as an inquiry-oriented activity in which some or all of the information learners interact with comes from resources on the Internet (Dodge, 1997). Students take information from the Internet and use it to solve a problem presented to them. It starts with an Introduction where interest is created for the activity. Next is the Task. This is where students are given the activity they are to complete. The Process section is the step-by-step instructions student's follow to complete the assignment. The Process section also includes the Internet resources needed by the students. These pre-approved websites help students focus on the assignment rather than spending time searching through the vast information available on the Internet. Students finish the Web Quest by completing a self-evaluation.

A Web Quest is used to enhance learning and achievement because students will use higher level thinking skills such as analysis and synthesis throughout the learning activity. This is its strength and what motivates students. A weakness is that students may lose track of the task when they get involved in approved websites or they may choose not to complete the task. The biggest challenge for a teacher wanting to use a Web Quest is finding the time to produce and plan for the activities and having access to reliable Internet resources and connections (Halat, 2008).

Web Quests can be used to supplement classroom learning or to replace current curriculum. This strategy gives students choices in how they approach learning the topic

assigned. When used with middle level learners, it can help them be engaged by using technology and by creating authentic real world related tasks (Schweizer & Kossow, 2007). It can also be used as an assessment tool to determine achievement.

Even though this study is focusing on middle level learners, there is much literature that looks at all age levels and technologies' effect on achievement. There is a lack of research using FCS classrooms and content to see if technology helps achievement and motivation. Many studies in areas other than FCS have found different types of technology to be helpful to student motivation and the learning process. Research has shown that intrinsic motivation has a positive effect on learning and academic achievement. Studies that address engagement of students using technology show positive results. Research studies that include achievement have had mixed results.

Schroff and Vogel (2009) investigated the difference in student's motivation between use of technology and use of no technology. It looked at different aspects of motivation. The study found that one aspect of motivation, choice, was significantly higher for the use of technology, slightly higher for perceived curiosity and had little difference in the aspect of interest. Chou (2007) studied middle level students, technology and what keeps them engaged in the technology-learning environment. The findings point to social interactions and relevance of the content being studied as the factors keeping students engaged.

Sherry (2005) researched college students in New Zealand to compare Millennials to older students to see what differences there were in their use of computers. One aspect

that was studied was motivation. When questioned about motivation or when the questions had the words “fun”, “makes me want to learn”, or “happiest” the Millennial students agreed strongly with these statements. Overall, the study found that computers are motivating to the Millennials.

Mistler-Jackson and Songer (2000) looked at how students viewed learning science through the use of technology. The use of a technology rich project revealed a high level of motivation and satisfaction with those students interviewed by the researchers. High levels of engagement and motivation keep students involved in the learning process, which can lead to improved achievement.

Fedison (2007) looked at use of technology, comparing middle level students in language arts classes when teaching them using traditional methods versus teaching with technology in the form of LCD projectors and PowerPoint presentations. The purpose of the study was to see the effect of technology on motivation and achievement. Using a survey completed by students, this study found that students are able to use and are motivated by technology. Test scores comparing two types of teaching indicated that achievement was impacted by technology especially for students with learning disabilities.

Liao (2009) did a study to enhance eighth grade students’ scientific conceptual change and scientific reasoning through a Web-based learning program. A lesson on atoms was taught using technology, a web-based course, and using conventional teaching

methods. The post-test scores of the technology group of students were significantly higher than the conventionally taught students.

Gurpinar, Zayim, Ozenci, and Alimoglu, (2009) also did a study comparing differences between using technology and not using technology. This research was designed for problem-based learning. They looked at student satisfaction and achievements. They found that students were satisfied with the online lessons from questions that used words such as “enjoyable”, and “motivation”. Post-test scores for the technology group were higher but not significantly higher than the non-technology group.

Cheaney and Ingebritsen (2005) did another study of problem-based learning in an online course. In this study they compared achievement of students using online/distance learning problem-based learning to classroom problem-based learning. The results of this study differed from others because the experimental group using technology, scored lower on the post-test than the control group.

Chang (2010) researched the effect of computer games on student achievement in math class. This study found that playing computer games had a positive effect on the achievement of students whose first language was not English.

Burgess (2009) studied the use of technology to help students needing help with reading. The purpose of this study was to examine the student’s critical thinking skills and motivation to read when technology, online communication tools, was used. The use of technology improved both engagement and critical thinking skills. The students

responded that they needed to do the reading to answer questions online. They felt they learned from the interactions with other students online as well.

Using technology including the Internet can engage students because it is a way to connect student experiences to real-world learning experiences. It helps keep what they are learning relevant to them. It can also provide material that may be more interesting to students than textbooks in the classroom. The Internet can provide many choices of available information for research, and depending upon the learning activity, can encourage student collaboration. When students are engaged, they can be motivated and this can lead to achievement (Guthrie and Davis, 2003). There is a lack of research in Family and Consumer Science on improving achievement-using technology in the FCS classroom. The lack of research makes this pilot study unique and necessary.



## CHAPTER THREE

### Methods

The purpose of this pilot study was to compare the level of achievement and motivation for engagement of middle school students in an FCS classroom using an Internet based inquiry (Web Quest) to the achievement and motivation of FCS students in a classroom without the use of an Internet based inquiry (Web Quest). Few studies have been done in FCS classrooms examining the level of achievement and motivation when using technology.

The purpose of this section is to describe the design of the research project, sample selection, and instruments used in the study. It will also cover the procedure for data collection and analysis. The results of the analysis will be used to compare the achievement of students using an Internet based inquiry (Web Quest) to the achievement of students using textbooks and worksheets (a more traditional approach).

The following research questions provided the focus for this study:

1. To what extent do middle school students achieve higher scores on content knowledge when using an Internet based inquiry (Web Quest) than when they do not use this tool?
2. To what extent does an Internet based inquiry (Web Quest) motivate middle level students?

### *Hypotheses*

1. There is a significant difference between student achievement in understanding content related to child growth and development in an FCS classroom using an Internet based inquiry (Web Quest) and achievement in child growth and development in an FCS classroom without the use of an Internet based inquiry (Web Quest).
2. There is a significant difference in student perception of their motivation in an FCS classroom studying child growth and development using an Internet based inquiry (Web Quest) and student perception of their motivation in an FCS classroom studying child growth and development without the use of an Internet based inquiry (Web Quest).

### *Design of the Study*

For this pilot study, a one to two week unit was developed by the researcher to be implemented in the classroom. The unit was developed using the school district's objectives and child growth and development curriculum developed within a professional learning community comprised of middle level Family and Consumer Science teachers. The unit, utilized a textbook and worksheets which has been the traditional approach. It was then adapted for an Internet based inquiry method, the Web Quest. Following the steps of a Web Quest, lesson plans for each teaching method included the same objectives, key questions and the following sections:

- **Introduction-** The introduction created interest in the upcoming lesson.

- **The Task-** Students were given the description of a specific assignment to complete.
- **The Process-** This section gave students the background information, detailed steps of the assignment and references related to the task.
- **Evaluation-** This section provided information for the students to help them understand the outcomes expected of them, e.g., a rubric.
- **Conclusion-** The section included a statement of the content students should have learned, why they learned it, and time for students to share final projects.

A teacher educator reviewed the lesson plans for both approaches (see Appendix A).

The Internet lesson plan (Web Quest) on child growth and development was used with the experimental group. Access to computers and the Internet for this lesson was available to the students in the experimental group participating in the study. A lesson plan on child growth and development using textbooks and worksheets was used with the control group. The same textbooks were available to all students in the control group participating in the study. Both lessons had students learning about ages and stages of child growth and development and how caregivers can help children grow and develop physically, mentally, socially, emotionally and morally. The information was used by the students to create an activity that would benefit growth and development of children in one of the age categories studied.

Local middle level FCS teachers were recruited to voluntarily participate in the pilot study. For the pilot study, the decision was made to have the researcher teach the control group. This was done to remove the researcher's bias toward technology that could skew the results. After being recruited, teachers were trained to teach the child growth and development unit. The researcher developed the training script (see Appendix B). The process was reviewed by a teacher educator and a practice training session with another teacher was completed before the teacher training session to be sure instructions were clear, to keep the study as controlled as possible. In the training session the teacher received scripted lesson plans, the Web Quest link, and a chance to walk through the Web Quest. Tests and surveys were given to the teacher at the training session. Follow-up emails were sent with reminders of the timeline for the research. Return envelopes were given to the teacher at the training session and were used to collect tests and surveys.

Student subjects were recruited, using a script written by the researcher, one week prior to the start of the unit and were given a letter to notify their parents that they had the opportunity to participate in a research study (see Appendix C). This letter also gave parents the option to have their student not participate in the study. Non-participating students would have an alternate, independent assignment during the unit and would learn the same content.

School district and University of Nebraska's Institutional Review Board (IRB) approval was obtained for this pilot study. A letter was sent to the school district's

Director of Evaluation requesting permission to conduct the study in middle school Family and Consumer Science classrooms. Included in the letter was a summary of the research procedures and expectations for the school district's participation in the study (see Appendix D). Principal approval was also obtained for the schools included in the study by way of email (see Appendix E). Once the school district approved the study IRB approval was sought. The process started by filling out an online application and submitting it. The University IRB evaluated rationale for the study, protocol, privacy of students and all documents and it was approved (see Appendix F).

#### *Selection of the Sample*

For this pilot study a convenience sample was used. Nine local middle level FCS teachers were contacted by email and in person and asked if they would like to participate in the study. Only one teacher volunteered to participate. The school district's curriculum specialist for FCS and a teacher educator made contacts to encourage participation but no other teachers volunteered. As a result, only two classrooms were included in this pilot study. The teacher received a \$25 Barnes and Noble gift certificate as a thank you for participating. Participation in the study was completely voluntary. The control group (non technology) was taught by the researcher. The volunteering teacher taught the experimental (technology) group. Having only two groups was not ideal and constrained the research because of the circumstances. It was determined for this reason this project should be considered a pilot study. The students of these teachers were the study subjects.

### *Instrumentation*

The same pre-test and post-test (see Appendix G) were used with each group. The researcher, using the objectives and key questions of the unit being taught, developed these tests. A teacher educator reviewed the tests. The pre-test scores were compared with the post-test scores to determine the effect technology had on achievement.

Researcher-designed and teacher educator-reviewed surveys (see Appendix H) were given to the students and teachers to get their perceptions of motivation and learning in the context of the pilot study. Questions were asked to determine whether being taught with technology was perceived by the students as more motivating than being taught with textbooks and worksheets. There was a different survey for each group of students and their teacher. The stems of the questions, for the two groups, were the same. The difference in the questions was the type of teaching method each group experienced. A four-point likert scale was used with these possible answers: Strongly Agree-4, Agree-3, Disagree-2, and Strongly Disagree-1. These four points directed the subjects to either agree or disagree with no possibility for a neutral answer.

### *Data Collection*

Tests and surveys were given to the teacher at the training session. Follow-up emails were sent with reminders of the timeline for the research. Return envelopes were given to the teacher at the training session and were used to collect tests and surveys. The experimental group teacher used the envelopes to send the data to the researcher.

Students took a pre and post-test (see Appendix G) assessing the level of learning. Students and teachers were surveyed on their perceived level of motivation using a researcher-designed survey (see Appendix H). A neutral third party, such as an administrator, was contacted and asked to administer the pre and post-tests and the surveys to keep the results controlled and as free from bias as possible.

#### *Analysis of Data*

Descriptive analysis of the teacher's demographic data and survey results was completed to determine mean age, years of teaching and education level. A pairwise comparison was used to determine if a significant difference existed between the mean test scores of the experimental group using Internet based inquiry (Web Quest) and the control group using textbooks and worksheets. The survey questions were analyzed using a t-test to determine which type of lesson students perceived as more motivating. The mean scores for the survey questions were used for this comparison.

## CHAPTER FOUR

### Findings and Discussion

The purpose of this pilot study was to compare the level of achievement and motivation for engagement of middle school students in an FCS classroom using an Internet based inquiry (Web Quest) to the achievement and motivation of FCS students in a classroom without the use of an Internet based inquiry (Web Quest). For this pilot study there were two groups of students, an experimental group and a control group. This chapter will describe the demographics and statistical findings and discuss those findings in relation to the literature.

#### *Teacher Data Descriptive Analysis*

A descriptive analysis of the teacher demographic information (see Table 4.1) is being presented because of the small number of teachers participating in this pilot study. As seen in Table 4.1 both teachers use technology in the classroom. This is in line with Manley's (2000) findings that FCS teachers are using technology, especially the Internet. Both teachers have it available at their schools and feel they have been trained to use it. The teachers were not close in age with at least a 15-year difference in age. There was not a big gap in the number of years taught between the two teachers. Each teacher felt strongly about using technology and the availability of technology at their school. Having access to technology at their schools helped alleviate the challenge of lack of access for using a Web Quest that Halat (2008) wrote about. Access may be a big



influence on their desire to use technology. With neither teacher more than 10 years from their teacher education programs, they have had more instruction in the use of technology and there has been more technology available to them for both personal and educational purposes. This probably helped them feel strongly about using technology. This follows what Marks (2008) found in his study of pre-service teachers that when they had training in technology they were more confident in using technology. The more technology is used and becomes a part of daily life the easier it may be to learn it and incorporate it into the classroom. The small number of teachers makes it difficult to generalize the results of this study to FCS teachers in general but the strong desire to use technology is a step in the right direction.

**Table 4.1**

Teacher Demographic Data

Questions	Control	Experimental
I use technology in the classroom.	1	1
Technology is available at my school.	1	1
I have been trained in the use of technology.	1	2
Number of years as a teacher	5-10	0-5
Age Range	45+	25-30
Education Level	Bachelors + hours	Bachelors

Note. Survey likert scale. 1 = Strongly Agree; 4 = Strongly Disagree

**Table 4.2**

## Teacher Survey Questions Scores

Question	Control	Experimental
<p><b>1. Control-</b> I feel students look forward to coming to class to work and learn about child growth and development from the textbook and worksheets.</p> <p><i>Experimental-</i> I feel students look forward to coming to class to work and learn about child growth and development using the computer and the Internet.</p>	3	1
<p><b>2. Control and Experimental-</b> Students seem to think learning about child growth and development was fun.</p>	3	2
<p><b>3. Control-</b> I felt students learned a lot by reading the textbook and doing the worksheets.</p> <p><i>Experimental-</i> I felt students learned a lot using the computer and the Internet.</p>	1	2
<p><b>4. Control-</b> Reading the textbook seemed to make learning enjoyable for students.</p> <p><i>Experimental-</i> Using the computer and Internet seemed to make learning enjoyable for students.</p>	3	1
<p><b>5. Control-</b> I feel students would rather use the textbook and worksheets to learn child growth and development than a computer and the Internet.</p> <p><i>Experimental-</i> I feel students would rather use a computer and the Internet than the textbook and worksheets to learn child growth and development.</p>	4	1

Note. Survey likert scale. 1 = Strongly Agree; 4 = Strongly Disagree

Answers from the Teacher survey give an insight into the teacher's perceptions of their student's achievement and engagement (see Table 4.2). Both teachers felt students learned the content being taught regardless of teaching method. Each teacher felt student engagement was affected by the teaching method used. The perception of the teacher teaching using the textbook and worksheets with the students was that students were not

motivated or engaged in the textbook and worksheets method of teaching. This is indicated by answers of disagree and strongly disagree to the survey questions #4 and #5 as seen in Table 4.2. It must be noted, however that the teacher of the control group was the researcher so bias could have been introduced in this part of the study. The perception of the teacher using the computer and Internet with students was that students were motivated or engaged in the computer and Internet method of teaching. This is indicated by answering questions #4 and #5 strongly agree.

#### *Student Data Analysis*

Demographic data was collected from the students that included gender and information on their access to computers and the Internet outside of school (see Table 4.3). The student subjects identified themselves as either male or female. They were asked to answer yes or no to whether they had access to a computer and/or the Internet outside of the school day. As seen in Table 4.3, most students in the study had access to both computers and the Internet outside of school. A similar percentage of computer access as this research study was found by Sherry (2005) where 91% of students had access to computers in a study of Millennial-aged students.

**Table 4.3**

## Student Demographic Data

Variable	Control	Experimental
Females	52.5 %	52 %
Males	47.5 %	48 %
% Computer access outside of school	95 %	97 %
% Internet access outside of school	95 %	100 %

Note. Control Group (n=37) Experimental Group (n=21)

The hypothesis of this pilot study was that achievement of the students using technology would be significantly greater than the achievement of the students using textbooks and worksheets. Results showed that both groups of students learned the material because both group's post-test scores measuring achievement of content knowledge were greater than their pretest scores (see Table 4.4). Table 4.4 shows the improvement in scores measuring achievement of content knowledge for the control group was significant in a pairwise comparison. The improvement in scores measuring achievement of content knowledge for the experimental group was not significant in a pairwise comparison.

**Table 4.4**

## Student Achievement Data

Group	N	Pre-test	Post-test	Mean Difference	Std. Error	Sig.
Control	37	13.35	16.24	2.892*	.425	.000
Experimental	21	12.61	13.71	1.095	.563	.057

Note. \* The mean difference is significant at the <.05 level in a pairwise comparison.

**Table 4.5**

## Participating School Demographics

Variable	School A (experimental)	School B (control)
Total Student Population	670	889
Minority students	59%	24%
Special needs	18%	18%
Gifted	10%	32%
English Language Learners	18%	0%
Free/reduced meal eligible	73%	44%

The experimental group result was similar to the result of Cheaney and Ingebritsen (2005) study. They also found that the experimental group that used technology, scored lower on the post-test than the control group.

There are several things that could explain this unexpected result related to the sample. First, this was a pilot study and had a small sample size. The academic makeup of the sample is unknown. If there was a greater than average percentage of academically challenged students in one of the classes this might have affected the results. There may also have been significant differences between the student populations of the two schools participating in the study (see Table 4.5). These schools have definite differences. Table 4.5 shows the school of the experimental group has a greater percentage of minority students, English language learners and students eligible for free or reduced lunch. The school of the experimental group has a greater percentage of gifted students. These differences in the sample could have affected the achievement results.

There may also have been things related to the design of the study that would account for the unexpected result. Is it possible that an unfamiliar teaching method influenced the result? A Web Quest may have been a teaching method students had not experienced before and therefore they had difficulties navigating the process and web sites. Another aspect of the study that could have affected the result is that students worked independently on the assignment. Prensky (2010) and Tapscott (2009) both feel this age group, Millennials, prefer collaborating. Giving students the option to work in groups may have produced a more positive result as in the example of Mark Zuckerman and his art history class. Through collaborating Zuckerman and his classmates gained knowledge about the course content and they improved their achievement. Giving the students a choice of teaching methods might have helped increase achievement. Since

the students in the control group did significantly increase their achievement using textbooks and worksheets, this teaching method might have been a better choice for students if they had difficulties using technology. Finally, would a different type or more variety of technology have helped the student's achievement? Including technology such as pod casts or interactive white boards could have been a positive addition to this research project.

There was a significant difference for both the control group and the experimental group in their engagement of learning and preference of learning modality (see Table 4.6). When students who used the computer and Internet were asked, if they would rather use the computer and the Internet to learn child growth and development than the textbook and worksheets, the mean score ( $M=1.725$ ) indicated they agreed or strongly agreed with the statement. When students who used the textbook and worksheets were asked if they would rather use the textbook and worksheets to learn child growth and development than the computer and the Internet, the mean score ( $M=3.71$ ) indicated they disagreed or strongly disagreed with that statement.

Finding that students were engaged or more motivated by using technology was not unexpected. The review of literature in the area of motivation showed many researchers found this same result. Sherry (2005) found Millennial-aged students were more motivated by technology. In studies where the teaching method differed and student motivation was compared, like in this pilot study, students were more motivated

by the use of technology (Fedison, 2007; Liao, 2009; Gurpinar, et al, 2009; and Cheaney and Ingebritsen, 2005).

**Table 4.6**

Student Motivation Data

Question	Control Mean (N=40)	Exper. Mean (N=21)	Mean Diff.	Sig (2-tailed t-test)
<p><b>1. Control-</b> I look forward to coming to class to work and learn more about child growth and development using the textbook and worksheets.</p> <p><i>Experimental-</i> I look forward to coming to class to work and learn more about child growth and development using the computer and the Internet.</p>	2.47	2.05	.38	.123
<p><b>2. Control and Experimental-</b> Learning about child growth and development was fun.</p>	2.475	2.24	.235	.300
<p><b>3. Control-</b> I felt I learned a lot by reading my textbook and doing the worksheets.</p> <p><i>Experimental-</i> I felt I learned a lot using the computer and the Internet.</p>	1.95	1.81	.14	.553
<p><b>4. Control-</b> Reading the textbook made learning enjoyable.</p> <p><i>Experimental-</i> Using the computer and the Internet made learning enjoyable.</p>	2.875	1.57	1.305	.000*
<p><b>5. Control-</b> I would rather use the computer and the Internet to learn child growth and development than the textbook and worksheets.</p> <p><i>Experimental-</i> I would rather use the computer and the Internet to learn child growth and development than the textbook and worksheets.</p>	1.725	3.71	-1.985	.000*

Note. Survey likert scale: 1 = Strongly agree; 4 = Strongly disagree.

\* significant at the <.05 level.



The students in this pilot study may have been motivated by using technology because the Web Quest was an interactive method of teaching rather than a broadcast method. This is what Tapscott (1998) found in his study of the Net Generation. According to Tapscott (1998) the interactive method involves making lessons student-centered with the teacher as a facilitator. The lessons should also have an element of fun and using computers and the Internet is something the students found to be fun.

## CHAPTER FIVE

### Summary, Recommendations and Conclusion

The purpose of this pilot study was to compare the level of achievement and motivation for engagement of middle school students in an FCS classroom using an Internet based inquiry (Web Quest) to the achievement and motivation of FCS students in a classroom without the use of an Internet based inquiry (Web Quest). This chapter will summarize the study and findings, discuss recommendations for future study in this area and discuss conclusions gathered from the research.

#### *Study Summary*

Each group was taught a two-week lesson on child growth and development that was developed by the researcher based on the school district objectives. Objectives and key questions were the same for both groups. The control group was taught with a conventional, teacher directed, method using textbooks and worksheets. The experimental group was taught with computers and an Internet based inquiry method. Students in each group were given the same pre-test and post-test to compare achievement.

Students and teachers completed a survey to give perceptions of their level of motivation for the type of teaching strategy they experienced. Questions used words students would understand related to motivation and engagement such as “fun” and “enjoyable”. The survey was scored on a 4-point likert scale.

Demographic information was gathered to provide some information about the teachers and the student subjects. Teacher information included age range, number of years teaching and educational level achieved. Additional questions were asked of the teachers about technology use, availability and training. Student information included gender and access to computers and Internet outside of school.

Out of 10 middle level FCS teachers recruited, two teachers volunteered. The control group had 42 students participate but because of absences the sample size was 37 for the study. The experimental group had 24 students participate but due to absences the sample size was 21 students for the study.

### *Summary of Findings*

#### *Teacher Results*

The following is a list summarizing the teacher-related results of this research project:

1. The difference in age and teaching experience did not appear to affect the teacher's use of technology.
2. Both teachers used technology in the classroom, had access to technology at their school, and felt they were trained to use technology.
3. Both teachers felt students learned the content being taught regardless of teaching method.
4. According to the teachers' perceptions, student engagement was affected by the teaching method used.

### *Student Results*

The following is a list summarizing the student-related results of this research project:

1. Student access to computers and Internet varied.
2. Student achievement increased in both groups as indicated by higher post test scores.
3. Students who used textbooks and worksheets increased their achievement significantly.
4. Students who used computers and Internet increased their achievement but this was not statistically significant.
5. There was a significant difference between the control group and the experimental group in their engagement of learning and preference of learning modality.

### *Recommendations*

On the basis of the review of literature and findings of this research, several recommendations are made for practitioners and for future research.

#### *Recommendations for Practitioners*

1. Teacher education programs may want to consider greater use of technology in the curriculum to help pre-service teachers feel comfortable including technology as a teaching method.
2. School districts may want to offer more staff development opportunities related to technology so teachers feel comfortable using it in their classrooms.
3. Family and Consumer Science teachers should be informed about considering utilizing more technology in their curriculum, since it appears students are motivated by it.
4. Administrators and teachers could use this study to justify purchasing updated technology for teachers to use in their classrooms.

*Recommendations for Future Study*

1. Examine student achievement through a replication of the study using a larger sample of Family and Consumer Science students. A larger sample size could produce a statistically significant result.
2. Make changes in the methodology to accommodate what is best for learners. Specifically changes to the unit of lessons to include different technology, more choices and collaboration.
3. Make changes in the methodology to take into account diversity of learners and their abilities.

### *Conclusions*

Technology is available to teachers and should be used in the classroom. It is a tool that can help teachers plan lessons that are interactive, current, relevant and real and therefore motivating to students. Teachers should not hesitate to use technology as part of their teaching methods because they don't have extensive training. A basic understanding of technology is all that is needed to initiate the use of technology because most students have considerable experience with technology. They are the Millennial Generation, have grown up with it and it is a part of their world. If students are motivated and focused on the lessons, then their opportunity for learning and achievement increases.

This pilot study showed that technology was motivating to students, they preferred using technology over traditional teaching methods. This is evident in the classroom when students have technology available to them. In this situation students are motivated, they enjoy coming to class, and they are focused on the task. Students that find it difficult to concentrate in a teacher directed learning environment will thrive in a student centered environment that technology may create.

The results related to achievement, while not what was expected did show a trend that should be explored in the future. A possible explanation of this could be learning abilities of the students in the study. Little is known about initial abilities of the students in the experimental group. Future research could include information related to learning disabilities or possible language barriers. Both of these things would affect the student's

ability to achieve. Using technology, especially the Internet requires reading skills. Students that have difficulty with language and reading comprehension will struggle with navigating web sites to locate the information needed to complete the lesson. Another aspect of this study that may have affected the achievement findings was the small sample size. Larger number of students may show a statistically significant increase in achievement because you would have a better representation of the student population. The students in this study worked individually on the assignment. Future studies in this area might benefit from using collaboration as part of the design of the study. Today's learners want to collaborate and may improve their achievement through collaboration.

Technology is here to stay. Teachers must learn to use technology in their classrooms in ways that will increase student motivation and achievement. Studies, such as this project, can be useful in helping discover strategies which will promote student learning.

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**APPENDIX A**

**Lesson Plans**

Thank you for agreeing to volunteer to help with my research study. You will be teaching a **7<sup>th</sup> grade FCS Child growth and development Unit**

These are the objectives and the key questions for the curriculum

**Objectives:**

Students will be able to identify the developmental stages of childhood. (2.4.1)

Students will be able to recognize the responsibilities involved in caring for children. (2.3.2)

Students will be able to demonstrate safe and appropriate developmentally activities for children. (2.4.3)

**Key Questions**

What are the age ranges of infants? Toddlers? Preschoolers?

What are examples of physical development for each age of development?

What are examples of mental/intellectual development for each age of development?

What are examples of social development for each age of development?

What are examples of emotional development for each age of development?

What are examples of moral development for each age of development?

How does play help children grow and develop?

How do toys help children grow and develop?

How do books and reading help children grow and develop?

How can we keep children safe in the home?

How can knowledge of growth and development be applied to age appropriate activities for infants, toddlers or preschoolers?

Here is the lesson plan for the non-technology unit. (Each teacher will have a copy.) Do not deviate from these plans to keep the results consistent from school to school.

**Day 1-Pretest/Introduction/Ages**

**Set-**During this unit you will be participating in a research study. You will learn concepts related to growth and development of infants, toddlers and preschoolers; complete a project related to this topic; and take a pre and post-test related to these concepts. You will also be able to share your thoughts about how much you enjoyed the unit. I will have some one else give you the pretest. Just write your student ID # on the slip of paper stapled to the pretest. Answer questions the best you can. You are not expected to know the answers at this time. Turn them in when you are finished.

**Intro Care giving** - This unit on child growth and development is part of the care giving area of work of the family. How can we define care giving without using the words care or give or any form of those words? (meeting others needs-physical, emotional, social, mental) The focus of this care giving unit is Growth and Development of young children-infants (birth to one year), toddlers (one year to three years), preschoolers (three years to five years) [write this on the board]

We all have different Areas of development that we go through– {ask students what they think each of these words mean related to development} Physical (growth of the body- bones, muscles, coordination, senses), Mental (growth of the brain-thinking, vocabulary, imagination), Emotional (learning how to properly express feelings), Social (developing relationships with friends and family), Moral (learning difference between right and wrong) [write these on the board]

**Activity-**To learn how children grow and develop you will be working on a group project researching one of the age groups and how they grow and develop.

[Teacher -Divide class into 6 groups-pass out project sheets], make a poster or brochure using that research, and present to the class information and specific examples of the areas of development, types of play and age appropriate toys for the age group randomly assigned to them.

You will use the Skills for Life textbook as your resource, chapter 14 for areas of development and chapter 16 for types of play and age appropriate toys. Divide the research among group members and record your research findings on this project sheet. When the research is complete you will complete a poster or brochure having each group member write their own research information on the poster. You will have time in class to do this but can be finished tomorrow if you do not get it completed.

[give students time and materials to complete the assignment]

Resources/materials- Pretest

Study script

Skills for Life textbook

Growth and Development project handout

Papers with ages written on for random distribution

Poster paper/markers/colored pencils/rulers

### **Day 2-Areas of Development**

**Set-**[Review instructions and give time needed to complete poster.] You will have time to complete the poster having each group member write their own research information on the poster.

**Activity-** Child Growth and Development Chart.

While waiting for posters to be completed [hand out the blank charts ] fill in all information for the age group you have researched.

**Conclusion-**Now that the posters are completed groups will share the information with the class in the order it is in on the chart. You will be completing the sections of the chart as groups present. [Use the document projector (Elmo) to project the information on a screen.]



Pick one area of development and see how a child grows in that area from being an infant to being a preschooler. [Discuss what they see]  
Turn in poster, project sheet and chart.

Resources/materials- Student group work in progress  
Growth and development chart handout  
Elmo and LCD projector

### **Day 3- Growth and Development and play**

**Set**-What are the age groups and areas of development (write on board) How would you define play? (activity people participate in because they choose to) Today we will be learning how play is important to development.

**Activity**-Importance of play anticipation guide

[Hand out anticipation guide and go over directions.] Before we talk about how play helps with development I want you to think about some statements related to play and see what you think first. You are to answer all questions True or False and give a reason for the answer. Please use examples for reasons. {give time to finish anticipation guide}  
Now that you have finished the guide, you will read an article about play and development out loud. We will go over the anticipation guide at the same time.

**Conclusion**-Now let's review areas of development and connect what types of play help children develop in each area. [go through each area and have students share thoughts about it]

Resources/materials- Anticipation guide handout  
Importance of play reading handout

### **Day 4- Growth and Development and Toys**

**Set**-Review age groups and areas of development. (write on board) Relate areas of development and examples of toys. (class discussion)

**Activity**-Toy evaluation

Pass out the handout on evaluating toys. Go over evaluation criteria and check vocabulary understanding. Pass out pictures of toys and have students evaluate a toy and determine what areas of development are enriched by the toy.

**Conclusion**-When all are finished with the evaluation, have students share their evaluations. Show toy on screen using Elmo.

Resources/materials- Laminated pictures of toys  
Evaluating toys handout  
Elmo and LCD projector

**Day 5-Growth and Development and Books and Reading**

**Set-**Review age groups and areas of development. (Write on board) Relate each area of development to how books and reading help that area. (class discussion)

**Activity-**Book project

Students will develop a book for a specific age group. The book will be age appropriate.( This information comes from growth and development chart. The book will be at least 6 pages long including at least one complete sentence and a picture on each page. The student will identify which areas of development that is helped by their book. They will complete the project sheet first, have that checked by the teacher and then get a booklet to complete

**Conclusion-**Have students share books with other students

Resources/materials- Book project sheet  
Booklets (two sheets of paper folded together into ¼ ths)  
Colored pencils  
Markers

**Day 6- Growth and Development and Home Safety**

**Set-**Review age groups and areas of development. (write on board)

**Activity-**Read section on safety in Skills for Life textbook(page 181-182) Have students write a description of their room at home and at least 10 specific things they would need to do to childproof it. Have students share what they wrote

Resources/materials- Skills for Life textbook  
Paper for writing

**Day 7 and 8- Child Care Activity Design Project/Sharing projects**

**Set-**Introduce project expectations/rubric.

**Activity-**Individual project or groups of 2 to develop an activity that is appropriate for one of the age groups being studied. It should help at least 5 things related to the five areas of development for the age group. Safety of the activity needs to be considered. Directions should be clear. Activity will be created or drawn with a written description that will be shared with the class.

**Conclusion-**When students are finished with project have students share with class

Resources/materials- Project instructions and rubric  
Materials for project creation-paper, markers, glue, stapler

**Day 9-Share projects**

**Set-**Have students share projects. Presentation should include age group and area of development the activity will help.

**Activity-** Review age groups and areas of development and key questions. (Class discussion)

Resources/materials- Hand out with key questions

**Day 10-Post-test/survey**

**Set-**Read script for post-test and survey

**Activity 1-**Administer post-test and survey.

**Activity 2-**Word games to finish up.

Resources/materials- Post test  
Survey  
Enrichment activities

**APPENDIX B**

**Teacher Training Session Script**

The goal of this pilot study is to determine if the use of technology improves student achievement and whether it impacts students' motivation. The researcher will be looking at the differences in academic achievement through pre and post tests of content. In addition, a survey will be used to study the impact of the teaching strategy on student motivation. In other words does the strategy motivate students to participate in class and learn the concepts?

Confidentiality is very important. It will be necessary to keep the students' identity confidential. Students should not put their name on the pre-test, post-test or survey. They should instead record their school identification number on the paper attached to each item. The teacher may want to use the posttest as the unit exam, and if so, you will want to record the students' grade in your grade book. After the scores are recorded, code the test/survey with a letter assigned to your school by the researcher and a number you assign to each student, starting with #1 through the number of students participating. (Example: If you are school A, the numbers would be A1, A2, A3 and so on) Keep a list of the number you assign to each student so you can use the same number for the post-test and survey for each student. Then remove the students' school identification numbers to protect the students' identities. Use the same number for each student for the pre and post test and survey so we can compare their scores from the beginning of the class until the end.

The researcher will not see the students' school identification number but only the number you assign. At the completion of all of the tests and surveys in the study, you can destroy your list of student numbers.

It is important to make certain each class in this study is conducted in the same way so bias is controlled. Please use the scripts and lesson plans for this. Follow the scripts and the plans so the results of the study will provide meaningful data.

The curriculum (Traditional or Web-based) you use will be assigned randomly. Some teachers will follow a traditional curriculum and others will use a curriculum that incorporates a web-based strategy. It is important to follow the ten day lesson plan as it is written for your school.

The curriculum will follow a ten day lesson plan. An outline of the curriculum is below.

#### **Traditional/Non-technology classroom**

The timeline or pacing of the class is as follows:

Day 1	Pretest
	Introduction /Ages of children

Day 2	Areas of Development
Day 3	Growth and Development and play
Day 4	Growth and Development and Toys
Day 5	Growth and Development and Books and Reading
Day 6	Growth and Development and Home Safety
Day 7 and 8	Child Care Activity Design Project/Sharing projects
Day 9	Share projects
Day 10	Post-test
	Survey

### **Web-based/Technology classroom**

The timeline or pacing of the class is as follows:

Day 1	Pretest
	Introduction of WebQuest
Day 2-7	Students research growth and development of infants, toddlers and preschoolers and incorporate information into the WebQuest task.
Day 8-9	Share projects
Day 10	Post-test
	Survey

After the teacher has recorded a letter and number for each student on the top of their completed tests and survey, this raw data will be returned to the researcher. Three envelopes will be provided for this purpose, one for the pretest, one for the posttest and one for the survey. On the outside of each envelope record the number of students participating in this test/survey. Return each envelop to the researcher no more than two days after the instrument (test or survey) is completed and scores you need for your grade book are recorded.

Thank you for participating in this research project. A copy of the abstract of the study, including the overall findings, will be sent to you after the data are analyzed.

**APPENDIX C**

**Parent Notification Letter**

Dear Parent/Guardian,

Your student is in 7<sup>th</sup> grade Family and Consumer Science and has the opportunity to participate in a research study this quarter. All students participating in the study will learn the same concepts related to growth and development of infants, toddlers and preschoolers. This is part of our regular curriculum. Teachers will use different methods of teaching and then the student achievement and motivation levels for each method will be examined. All the materials used in these lessons will be available for you to review before the lesson is taught if you would like to do so. This unit will be taught after September 15. If you have any questions regarding the materials you may contact the researcher at [jlokie@lps.org](mailto:jlokie@lps.org).

If you choose you may request that your student not participate in the study by completing the bottom portion of this letter and returning it to school with your student. Students not participating in the study will have an independent study activity to complete on the same topic.

Thank you for supporting and encouraging your student and all you do to help your child's teachers.

Sincerely,

Family and Consumer Science Teacher

---

I request that my student not participate in the research study being conducted in Family and Consumer Science class. I understand he/she will be given independent study work on the same topic.

Student Name \_\_\_\_\_

Parent/Guardian Signature \_\_\_\_\_



**APPENDIX D**

**School District Research Request Letter**

4014 N. 44<sup>th</sup>  
Lincoln, NE 68504  
402-466-6448  
June 21, 2010

Director of Evaluation  
Lincoln Public Schools District Office

Dear Director of Evaluation,

As you know, students are adept at using technology; they expect to use technology, but will technology help them learn the concepts presented in our classrooms? The use of technology in the classroom has always interested me and as a Master's degree candidate, my thesis proposal is related to student achievement, motivation and technology. This letter is a request to conduct my thesis research in Lincoln Public Schools.

The title of my study is: Examining student achievement and motivation using Internet-based inquiry in the classroom. The purpose of this study is to compare middle school Family and Consumer Science student achievement and motivation in a classroom using Internet based inquiry (Web Quest, a technology tool) to achievement and motivation in a classroom without the use of Internet based inquiry. The study will give middle level Family and Consumer Science teachers data related to achievement that can be used for the Professional Learning Community as a smart goal this school year. The research would take place during the first quarter of the 2010/2011 school year. Julie Johnson, Chairperson of Child Youth and Family Studies at the University of Nebraska will supervise this research project.

I have included with this request a summary of the research procedures, my expectations for participation by LPS and survey instruments to be used. Because the study is part of the curriculum, a parent notification letter rather than a permission form will be sent home with students and is also included. IRB approval is being submitted for this research study. Thank you for considering this request.

Sincerely,  
\

Julie M. Lokie  
Family and Consumer Science Teacher

### Irving Middle School

#### Procedure Summary:

1. Family and Consumer Science (FCS) teachers will implement a two-week unit of lesson plans, developed by the researcher. The content of these lessons is already a part of the middle level FCS curriculum and will not take away from instructional time for students.
  - An Internet lesson plan (Web quest) on child growth and development will be used with one group of 7<sup>th</sup> grade FCS students. Access to computers and the Internet for this lesson should be available for the students participating in the study.
  - A lesson plan on child growth and development using textbooks and worksheets will be used with another group of 7<sup>th</sup> grade FCS students. The same textbooks will be available to the students participating in the study.
  - This unit will be on ages and stages of child growth and development and how caregivers can help children grow and develop physically, mentally, socially, emotionally and morally.
  - The content learned will be used by the students to create an activity to benefit growth and development of children in one of the age categories studied.
2. Students will take pre and post tests to assess their achievement level related to the content
3. Students will complete a survey to determine their level of motivation.
4. Tests and surveys will use student ID numbers so the researcher is unaware of their identity.

#### Expectations of LPS participation:

- Middle level FCS teachers would be solicited for participation and selected on a voluntary basis.
- Number of schools and FCS teachers to be involved with the study is between 4 and 8 middle schools.
- Between 80 and 160 students would be involved.
- Teachers will be required to teach the prepared lessons taking one or two class periods each day for two weeks.
- Prior to teaching the classes, they will attend a two-hour training session where they will go over the lesson plans. The teachers will receive all materials needed and will have very little planning time involved in presenting these lessons.
- The lessons will be taught during first quarter of the 2010-2011 school year.
- An administrator at each school will be asked to administer the pre and post tests and surveys. This will take no more than one hour of their time.

**APPENDIX E**

**Principal Approval Correspondence**

**From:** Hugh McDermott <[hmcderm@lps.org](mailto:hmcderm@lps.org)>

**Date:** September 14, 2010 7:16:40 AM CDT

**To:** Julie Lokie <[jlokie@lps.org](mailto:jlokie@lps.org)>

**Subject:** Research at Irving

Julie and UNL,

You have my permission to do the requested research with our Family and Consumer Science classes during the 2010-2011 school year.

Thanks,

Hugh

**From:** Ryan Zabawa <[rzabawa@lps.org](mailto:rzabawa@lps.org)>

**Date:** September 21, 2010 1:55:16 PM CDT

**To:** Julie Lokie <[jlokie@lps.org](mailto:jlokie@lps.org)>

**Subject:** Re: Master's Research Project

We will help. Tell me when.

On Sep 21, 2010, at 11:42 AM, Julie Lokie wrote:

Dear Mr. Zabawa,

My name is Julie Lokie. I am the Family and Consumer Science Teacher at Irving Middle School and I am working on finishing my Masters in Family and Consumer Science Education. I have a proposed research study I would like to complete this fall. The title of the research is Examining student achievement and motivation using internet-based inquiry in the classroom. Moriah Reinwald, the FCS teacher at Park, has volunteered to help with the study. I have received approval from my committee and from Dr. Lukin, Director of Assessment and Evaluation Services. Dr. Lukin requested that I contact the principals at the school where teachers have volunteered to get permission. I would like to conduct the research at Park and am asking for your permission. I have attached the letter to Dr. Lukin that summarizes my research and includes a summary of procedures and my expectations for LPS participation. I have also attached the letter that notifies the parents of the opportunity for their child to participate in the study. To help eliminate as much bias as possible I will need an administrator or other staff member besides Ms. Reinwald to proctor the pre and post-tests and surveys. This will take a small portion of two class periods. If you have any questions please contact me.

Thank you for your time and consideration of this research project.

Julie M. Lokie

Family and Consumer Science Teacher

*Park Middle School is dedicated to providing the highest quality education and empowering all students to succeed in*

*a culturally diverse community, nation and world.*

Ryan Zabawa

Principal

Park Middle School

402-436-1212

**APPENDIX F**

**IRB Approval Correspondence**

Reviewer: Becky Freeman  
Date: 10/06/2010 04:33 pm  
*Ms. Lokie and Dr. Johnson,*

*Your project has been approved. You are authorized to begin data collection.*

*1. The approved teacher informed consent form has been uploaded to NUgrant (file with -Approved.pdf in the file name). Please use this form to distribute to participants. If you need to make changes to the informed consent form, please submit the revised form to the IRB for review and approval prior to using it.*

*Your official approval letter will be emailed to you and uploaded to NUgrant shortly.*

*Good luck with your research!*

*Becky Freeman  
472-8127  
bfreeman2@unl.edu*

**APPENDIX G**

**Child Growth and Development Pre/Post-test**



**Child Growth and Development Pre/Post-test**

Directions: Choose the best answer and circle the letter.

1. The age range for infants is
  - a. 5 years to 7 years old
  - b. 1 year to 3 years old
  - c. 3 years to 5 years old
  - d. Birth to 1 year old
  
2. The age range for toddlers is
  - a. 5 years to 7 years old
  - b. 1 year to 3 years old
  - c. 3 years to 5 years old
  - d. Birth to 1 year old
  
3. The age range for preschoolers is
  - a. 5 years to 7 years old
  - b. 1 year to 3 years old
  - c. 3 years to 5 years old
  - d. Birth to 1 year old
  
4. An example of physical development in an infant is
  - a. Learns how to crawl
  - b. Can cut with scissors
  - c. Develops all their primary teeth
  - d. Can dress themselves
  
5. An example of mental/intellectual development in a toddler is
  - a. Begins to understand some words
  - b. Asks many questions
  - c. Begin to separate fantasy from make-believe
  - d. Speak in full sentences
  
6. An example of emotional development in a preschooler is
  - a. Only expresses discomfort by crying
  - b. Cannot separate fantasy from make-believe
  - c. Start to cooperate and share
  - d. Begin to develop a sense of trust

7. An example of social development in a toddler is
  - a. Will play alone or alongside other children
  - b. Learn to follow rules
  - c. Can't do anything on their own
  - d. Start to develop a conscience
  
8. An example of moral development in infants is
  - a. Able to control their behavior
  - b. Learn right and wrong from caregiver's reactions
  - c. Know what is right and wrong from birth
  - d. Know how to follow rules
  
9. Play helps children grow and develop by
  - a. Helps them learn to take turns
  - b. Helps them with hand-eye coordination
  - c. Helps them use their imagination
  - d. All of the above
  
10. Toys help children by
  - a. Developing physical skills
  - b. Developing social skills
  - c. Developing mental/intellectual skills
  - d. All of the above
  
11. Book and reading help children grow and develop by
  - a. Developing physical skills
  - b. Developing social skills
  - c. Developing mental/intellectual skills
  - d. All of the above
  
12. We can keep children safe in the home by
  - a. Safely storing all household cleaners
  - b. Keeping all microorganisms out of the home
  - c. Dusting daily
  - d. Keeping the refrigerator clean
  
13. An infant is able to play with
  - a. A tricycle
  - b. A board game
  - c. Building blocks
  - d. Stuffed animals

14. A preschooler likes to play with
  - a. Crib mobiles
  - b. Rattles
  - c. Puzzles
  - d. Bicycles
  
15. Learning the difference between right and wrong is
  - a. Physical development
  - b. Mental development
  - c. Social development
  - d. Emotional development
  - e. Moral development
  
16. Growth and development of the body is
  - a. Physical development
  - b. Mental development
  - c. Social development
  - d. Emotional development
  - e. Moral development
  
17. Learning how to properly express feelings is
  - a. Physical development
  - b. Mental development
  - c. Social development
  - d. Emotional development
  - e. Moral development
  
18. Growth and development of the brain which includes learning is
  - a. Physical development
  - b. Mental development
  - c. Social development
  - d. Emotional development
  - e. Moral development
  
19. Learning how to get along with others and developing relationships is
  - a. Physical development
  - b. Mental development
  - c. Social development
  - d. Emotional development
  - e. Moral development

20. Child development is
- a. How a child grows and changes as they get older
  - b. When a child knows right and wrong
  - c. When a toddler throws a temper tantrum
  - d. How a child gets their teeth

**APPENDIX H**

**Student and Teacher surveys**

**Student Survey** (Control/Non-technology class questions)

Directions- Circle the number that describes how you feel about the statement.

SA-Strongly Agree A-Agree D-Disagree SD-Strongly Disagree

Male \_\_\_\_\_ Female \_\_\_\_\_

Computer access outside of school? Yes \_\_\_\_\_ No \_\_\_\_\_

Internet access outside of school? Yes \_\_\_\_\_ No \_\_\_\_\_

	<b>SA</b>	<b>A</b>	<b>D</b>	<b>SD</b>
1. I look forward to coming to class to work and learn more about child growth and development using the textbook and worksheets.	1	2	3	4
2. Learning about child growth and development was fun.	1	2	3	4
3. I felt I learned a lot by reading my textbook and doing the worksheets.	1	2	3	4
4. Reading the textbook made learning enjoyable.	1	2	3	4
5. I would rather use the computer and the Internet to learn child growth and development than the textbook and worksheets.	1	2	3	4

**Student Survey** (Experimental/Technology class questions)

Directions- Circle the number that describes how you feel about the statement.

SA-Strongly Agree A-Agree D-Disagree SD-Strongly Disagree

Male \_\_\_\_\_ Female \_\_\_\_\_

Computer access outside of school? Yes \_\_\_\_\_ No \_\_\_\_\_

Internet access outside of school? Yes \_\_\_\_\_ No \_\_\_\_\_

	<b>SA</b>	<b>A</b>	<b>D</b>	<b>SD</b>
1. I look forward to coming to class to work and learn more about child growth and development using the computer and the Internet.	1	2	3	4
2. Learning about child growth and development was fun.	1	2	3	4
3. I felt I learned a lot using the computer and the Internet.	1	2	3	4
4. Using the computer and the Internet made learning enjoyable.	1	2	3	4
5. I would rather use the textbook and worksheets to learn child growth and development than the computer and the Internet.	1	2	3	4

**Teacher Survey Questions** (Control/Non Technology group)**Directions-** Circle the number that describes how you feel about the statement.

SA-Strongly Agree A-Agree D-Disagree SD-Strongly Disagree

	<b>SA</b>	<b>A</b>	<b>D</b>	<b>SD</b>
1. I feel students look forward to coming to class to work and learn about child growth and development from the textbook and worksheets.	1	2	3	4
2. Students seem to think learning about child growth and development was fun.	1	2	3	4
3. I felt students learned a lot by reading the textbook and doing the worksheets.	1	2	3	4
4. Reading the textbook seemed to make learning enjoyable for students.	1	2	3	4
5. I feel students would rather use the textbook and worksheets to learn child growth and development than a computer and the Internet.	1	2	3	4

**General Technology Questions**

6. I use technology in the classroom.	1	2	3	4
7. Technology is available at my school.	1	2	3	4
8. I have been trained in the use of technology.	1	2	3	4

**Demographic Questions**

Number of years as a teacher: 0-5 5-10 10-15 15+

Age range: 25-30 30-35 35-40 40-45 45+

Education level: Bachelors Bachelors + hours Masters Masters + hours PhD



**Teacher Survey Questions** (Experimental/Technology group)

Directions- Circle the number that describes how you feel about the statement.

SA-Strongly Agree A-Agree D-Disagree SD-Strongly Disagree

	<b>SA</b>	<b>A</b>	<b>D</b>	<b>SD</b>
1. I feel students look forward to coming to class to work and learn about child growth and development using the computer and the Internet.	1	2	3	4
2. Students seemed to think learning about child growth and development was fun.	1	2	3	4
3. I felt students learned a lot using the computer and the Internet.	1	2	3	4
4. Using the computer and Internet seemed to make learning enjoyable for students.	1	2	3	4
5. I feel students would rather use a computer and the Internet than the textbook and worksheets to learn child growth and development.	1	2	3	4

**General Technology Questions**

6. I use technology in the classroom.	1	2	3	4
7. Technology is available at my school.	1	2	3	4
8. I have been trained in the use of technology.	1	2	3	4

**Demographic Questions**

Number of years as a teacher: 0-5 5-10 10-15 15+

Age range: 25-30 30-35 35-40 40-45 45+

Education level: Bachelors Bachelors + hours Masters Masters + hours PhD