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Family and consumer sciences secondary school teachers' orientations toward distance education technology for curriculum delivery

Lemonia N. Bigilaki
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Family and consumer sciences secondary school teachers' orientations toward distance education technology for curriculum delivery

by

Lemonia N. Bigilaki

A dissertation submitted to the graduate faculty in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Department: Family and Consumer Sciences Education and Studies
Major: Family and Consumer Sciences Education
Major Professor: Margaret Torrie

Iowa State University
Ames, Iowa
1996

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This is to certify that the doctoral dissertation of

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has met the dissertation requirements of Iowa State University

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**For the Major Department**

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CHAPTER 1. GENERAL INTRODUCTION

Introduction

Ostendorf (1989) noted that in recent years teaching young people and adults has changed in many ways. One of the major changes is the application of new technology in the traditional classroom. Indeed, "now technology has not only entered the classroom, it has become the classroom" (Ostendorf, 1989, p. ii). Furthermore, with the distance education phenomenon the classroom is no longer within the four walls of the room where the instructor is present; it is rather in many places simultaneously having remote students in multiple locations to interact with each other (Ostendorf, 1989).

By applying television technology, public schools are teaching a wide range of courses to their students who are many miles from their instructors. The main reason for the application of television to education is to provide more learning opportunities for more people. There is also a practical reason for the application of television which provides the opportunity for more people to get their education exactly where they are instead of bringing them to the traditional classroom (Ostendorf, 1989). In a television classroom activities and the interaction among students are
going through changes. Uninterrupted and extended lectures, unmodified graphics, outdated materials and unplanned interactive units are considered as poor learning experiences for distance education (Ostendorf, 1989).

Hughes (1988) stated that "because the technology of interactive television is still at an early developmental stage, programming using this technology remains scattered and often idiosyncratic in design" (p. 2). According to Hughes interactive instructional television has been used either to facilitate the offerings of courses or to provide opportunities for specialization in the existing curriculum. However, the integration of interactive instructional television into the core curriculum as a part of the basic instructional delivery system has not been widely attempted.

The Department of Vocational and Technical Education at the University of Minnesota conducted a study in two high school classes examining how teachers and learners interacted in classes that were held in an instructional television context. Their comments related to adjusting or using the technology. Equipment problems usually occurred because the equipment had not been checked before class. Students in these classes quite often assumed the responsibility for making technical adjustments to instructional television equipment. Another finding from this study was the phenomenon called "invisible class". An invisible class existed when a remote class did not participate fully and was not seen or heard by
others. In these classes, one remote site had fewer students than the others. The teachers called on members of this class fewer times and the students interacted much less than the students from the other classes (Thompson, Simonson, & Hargrave, 1992). McClelland (1987) stated that teachers can minimize invisibility by humanizing the instructional television classroom. In other words, teachers can focus on individuals and develop communication by calling on students in remote sites.

It is known that interactive instructional television is an emerging instructional delivery system that has the capability of overcoming physical barriers. Interactive instructional television allows for live audio and video communication between teachers and students. Although interactive television is technically "the next best thing to being there" it is still a technological delivery system that is extremely isolated. Therefore, teachers need to put forth a great effort in order to add a human touch to the delivery system (Thompson, Simonson, & Hargrave, 1992).

Studies have been conducted to examine teachers' abilities and their skills for teaching in an interactive television classroom at the high school level. There are also studies which have examined the students' perceptions regarding instructional television (Thompson, Simonson, & Hargrave, 1992).

Torrie and Hausafus (1996) conducted a study asking
family and consumer sciences and health secondary high school teachers about their use of distance education technology to deliver HIV/AIDS programs. Further, Torrie and Miller (1996) conducted a study asking middle/junior and senior high school vocational teachers to focus on competency-based curriculum issues and interactive teleteaching technology. Particularly, the Torrie and Miller (1996) study examined the knowledge, ability, interests, beliefs, and learning preferences of secondary school teachers relative to interactive teleteaching when using core competencies (leadership, job getting/job keeping, entrepreneurship). There were no studies found which examined family and consumer sciences secondary school teachers only. A concentration on teachers as an investigation group for this study was based on the fact that although it is technology that removes the barriers and expands opportunities for learning, it is the teacher who teaches (United States Congress, 1989, p. 11). According to Stewart (1996) the next decade will be a period of rapid change regarding the use of technology in family and consumer sciences. Improved hardware and software will enhance the integration of technology such as laser disks, interactive video, and distance learning facilities. Findings of her research review indicated a continuing necessity for in-service education for family and consumer sciences teachers regarding integration of technology (p. 258). Collis, Veen, and De Vries (1993) stated that necessary knowledge and skills are required for distance
education teachers in order to be effective. Anderson (1996) also stated that successful operation of a distance learning classroom requires the knowledge, ability, skills, and cooperation of a number of individuals. Especially, the teacher who is responsible for class content, design and delivery of instruction, degree of interactivity, and students' evaluation at all remote sites and the origination site (p. 166).

Thus, there was a need to identify family and consumer sciences secondary school teachers' knowledge, ability, interests, feelings, and teaching preferences toward interactive teleteaching. There was also a need to identify teachers' beliefs about interactive television as an instructional tool when they are using curriculum competencies. The purpose of this study was to identify family and consumer sciences secondary school teachers' self-reported knowledge, ability, interests, feelings, beliefs, and teaching preferences toward interactive teleteaching when using curriculum competencies.

**Definitions**

Competencies-- Competencies are learned behaviors which can be accurately repeated and measured to a predetermined standard (Iowa Department of Education, 1993, p. 5).
Distance education learning-- An educational process in which a significant proportion of the teaching is conducted by someone removed in space and/or time from the learner (Perraton, 1988, p. 34).

Distance education in Iowa-- Distance education in Iowa implies formal, institutionally based educational activities where the teacher and the learner are normally separated from each other in location but not normally separated in time, and where two-way interactive telecommunication systems are used for the sharing of video, data, and voice instruction (Simonson & Schlosser, 1995, p. 13).

Family and consumer sciences (FCS)-- Family and consumer sciences programs prepare youth and adults for family life as well as for occupations based on family life skills (Iowa Department of Education, 1993, p. HE-9).

Family and consumer sciences curriculum competencies-- Competencies which facilitate family life require knowledge in the areas of: a) housing and living environments, b) food and nutrition, c) individual and family health, d) individual and family development, e) consumer and resource management, and f) textiles and clothing (Iowa Department of Education, 1993, p. HE-9).
Fiber optics—A fiber optics telecommunications system converts video and data signals into digital light impulses which are transmitted over hair thin glass fibers (Iowa Distance Education Alliance, 1994).

Interactive television—Interactive television should be viewed as a communications system. A system might use satellite, coaxial cable, or fiber optic transmissions; regardless of the system used, communication is the purpose of interactive television (Johnson & Tully, 1989, p. 9).

Iowa Communication Network (ICN)—The Iowa Communication Network is a statewide two-way full motion interactive fiber optics network. Its main purpose is to connect colleges, universities and secondary schools throughout the state. It is being constructed completely with state and local funds (Iowa Distance Education Alliance, 1992).

**Operational Definitions**

The questionnaire "Use of interactive distance education teleteaching technology for family and consumer sciences competencies" was used to measure the following constructs: knowledge, ability, interests, feelings, beliefs and teaching preferences. Because the questionnaire was designed to assess the aforementioned constructs based on teachers' responses, all the constructs were recognized as self-reported ones.
Knowledge

Knowledge was defined as information about: 1. distance education interactive teleteaching, 2. integration of academics and technology into family and consumer sciences, 3. interactive teleteaching equipment, 4. applications of interactive teleteaching to family and consumer sciences, and 5. creations of teleteaching plans for distance education. Knowledge was measured on a five-point scale with "none" a number one and "extensive" a number five.

Ability

Ability was defined as capability to: 1. evaluate lessons via interactive teleteaching, 2. operate equipment, 3. speak with tone appropriate for teleteaching, 4. handle technical problems, 5. use a variety of teaching strategies via teleteaching, 6. deal with management responsibilities at separate teleteaching sites, 7. invite a guest speaker via interactive teleteaching, and 8. present entire course via interactive teleteaching. Ability was measured on a five-point scale with "very inadequate" a number one and "very adequate" a number five.

Interests

Interests were defined as statements indicating: 1. collaboration with other teachers outside and within the family and consumer sciences discipline, 2. invitation of guest speakers, professionals to interview students and employers to address student questions via interactive
teleteaching. Interests were measured on a five-point scale with "absolutely not" a number one and "absolutely yes" a number five.

Feelings

Feelings were defined as statements indicating personal opinions relative to interactive teleteaching and its use in family and consumer sciences subject area. These statements reflecting feelings were the following: 1. interactive teleteaching is too complicated, 2. interactive teleteaching makes teachers feel uncomfortable, 3. interactive teleteaching equipment makes teaching uneasy, 4. interactive teleteaching makes learning and teaching too mechanical, 5. interactive teleteaching does not allow social interaction, 6. interactive teleteaching should be used in family and consumer sciences area, 7. interactive teleteaching is a valuable teaching method for family and consumer sciences courses, 8. teachers prefer to teach with students who have learned previously in this way, and 9. teachers consider themselves as informed about interactive teleteaching. Feelings were measured on a five-point scale with "absolutely not" a number one and "absolutely yes" a number five.

Beliefs

Beliefs based on family and consumer sciences and core competencies were grouped in subunits. Teachers were asked to indicate whether family and consumer sciences and core competencies could be taught via an interactive teleteaching
classroom with one or two remote sites. Beliefs were measured by using a five-point scale with "strongly disbelieve" a number one and "strongly believe" a number five.

Teaching Preferences

Teaching preferences were defined as statements indicating teachers' preferences in order to teach an interactive teleteaching class. These statements included: 1. number of simultaneous sites such as one or two, three to five, and six or more sites, and 2. methods of collaboration, such as team-teaching (teacher responsible for all instructional sessions) and turn-teaching (teacher responsible for a segment of class). Teaching preferences were measured on a two-point scale with "do apply" a number one and "do not apply" a number five.

Orientations

In this study, the term orientations embraced all of the measured constructs: knowledge, ability, interests, feelings, beliefs, and teaching preferences.

Assumptions

Participants completed questionnaires honestly and accurately. The quality of information and validity of findings depend largely on accuracy of self-reports and subjectively reported data.
Limitations

Participants in this study were family and consumer sciences secondary school teachers in Iowa. Therefore, the results cannot be generalized to other populations or to other geographic areas.

Dissertation Organization

This dissertation is presented in the alternate dissertation format which allows for the inclusion of papers that will be submitted to scholarly journals for possible publication. The first manuscript identifies the family and consumer sciences secondary school teachers' self-reported knowledge, ability, interests, feelings and teaching preferences toward the use of interactive teleteaching. The second manuscript determines whether family and consumer sciences secondary school teachers believe that curriculum competencies can be taught via an interactive teleteaching environment. A general conclusions chapter is included at the end followed by appendices. Appendixes include: a) questionnaire, b) human subjects approval form, c) coding variables of the questionnaire, and d) supplemental statistical analyses.

Literature Review

Several questions need to be considered when examining distance education learning. First, what is distance
education and how is this term defined by researchers. Second, what is interactive distance education and how is this term implemented in Iowa. Teachers' opinions have also been documented in relation to interactive distance education in Iowa. Third, what are the policies of instructional telecommunications for vocational education in Iowa. The characteristics of family and consumer sciences programs as part of the overall vocational education are described. A particular emphasis has been given on the way that vocational competencies were developed including family and consumer sciences competencies.

**What is Distance Education**

According to Brown and Brown (1994) the concluding decade of the 20th century is the time of change from the institutional learning structures of the past centuries to the open education that occurs at a time and place suitable to the learner rather than the teacher (p. 3). Media and communications technology are incorporated to enhance this change in education. Digital telecommunications advances have fused video, audio, voice and data into a single electric channel. In this way, the delivery systems that support educational needs of distance education are simplified (p. 35).

Distance education is an educational process in which a proportion of the teaching is conducted by someone removed in
space and/or time from the learner (Perraton, 1988, p. 34). According to Simonson and Schlosser (1995) distance education in Iowa implies formal, institutionally based educational activities where the teacher and learner are normally separated from each other in location but not normally separated in time, and where two-way interactive telecommunication systems are used for the sharing of video, data, and voice instruction. (p. 13)

The Office of the United States Department of Education defined distance education as the application of telecommunications and electronic devices which makes learners able to receive instruction that originates from some distant location (Bruder, 1989, p. 30).

Rumble (1989) defined four parts to distance education. The first part includes several components such as a teacher, one or more students, a course that is being taught by the teacher and finally a contract between the students and the teacher. In the second inanimate distance education is described as a method of education in which the learners are physically separate from the teacher. For the third part learners are separated from the institution that sponsors the instruction. Finally, in the fourth part procedures used to evaluate students' performances may vary from traditional methods.

When defining distance education Keegan (1988a) described
six elements. The first element refers to separation of the teacher and the learners. The second element refers to the influence of an educational institution. The third is about the use of technical media. The fourth is about the application of two-way communication. The fifth refers to the possibility of occasional meetings for socializing purposes. Finally the sixth refers to the participation in a new form of education.

Garrison and Shale (1987) offered three criteria describing the following components as essential for the distance education process. The first refers to the educational communication which occurs noncontiguously between teacher and students. The second refers to the distance education process which should involve two-way communication between teacher and students. Finally the third refers to the technology which mediates the two-way communication (p. 11).

According to Hoyle (1996) distance learning is a general term used to cover the broad range of teaching and learning events in which the learners are separated (at a distance) from the instructor or other learners. Distance education learning environments offer opportunities for local and long distance collaboration, increased communication among students and teachers, access to the larger global community and access to "other" views of the world (Sheingold, 1990).

Nearly every state has funded a distance-learning program. The distance learning market grew 25% in 1992 and
another 35% in 1993. For instance, TI-IN Network of San Antonio, Texas is one of the first companies to sell distance-learning products. It offers interactive live satellite courses in math, science, and foreign languages to 650 high schools in United States. Demand for its services is growing so rapidly that the company plans to expand to 2,000 sites by next year (Piirto, 1993, p. 6).

**Interactive Distance Education**

**Interactive media and distance education**

A paradigm shift has occurred in education as the world has moved from the industrial age to the information age. This shift has provided educators with technological changes that have created new environments for teaching and learning experiences (Toffler, 1990). Such environments provide students with the ability to interact with the instructor and other students (Threlkeld & Brzoska, 1994).

According to Garrison (1993) distance education technology offers an opportunity for the creation of sharing learning; it maximizes communication not isolation. Particularly, interactive media expands the notion of using media as audiovisual aids to support traditional instruction. It is not singular and linear such as films and videos but rather interactive (Schwier, 1994). According to Threlkeld and Brzoska (1994) interaction can be categorized into two modes; the first mode is individual interaction between the students
and the course information in books, computer programs and laboratory experiments. The second mode is the students' social interaction with the teacher or other students. In distance education, interaction refers to the social interaction of students (p. 46).

There is a distinction within the social interaction such as synchronous and asynchronous. Synchronous means real-time, live and conversational as in the case of two-way audio and video communication. Whereas asynchronous social interaction means delayed, before or after instruction. This can be practiced through correspondence, computer-mediated and mailed communication. Through interactive distance education, students experience synchronous social interaction (Threlkeld & Brzoska, 1994).

It is known that media have played an essential role in instruction for many years and it will continue to be important in the future. Interactive media, however, can help teachers illustrate their presentations, supplement their lessons and provide learning resources and reference materials (Schwier, 1994). It focuses on teachers' ability to manage, deliver and control a wide range of educational activities (Hannafin, 1992).

In addition, interactive media not only can be used to deliver courses to learners but also can carry the primary responsibility for content delivery (Schwier, 1994, p. 216). In some cases interactive media is promoted as a solution to
the financial challenges faced by rural schools. For instance, at five high schools in rural Gibson County, Tennessee, students can take calculus and advanced English courses by live video (Piirto, 1993, p. 6). In this way, high schools are allowed to expand their curricula. Also universities are allowed to use targeted marketing. The Tennessee Public Service Commission organized a program that allows all universities to gain students by targeting slightly different segments (Piirto, 1993, p. 6). Interactive media involves computers, cameras, microphones and speakers, facsimile machines, visual projectors, videotapes and laser disc players, compact disc-read only memory (CD-ROM), and interactive television (Schwier 1994; Torrie & Hausafus, 1996).

**Interactive television**

One of the new educational technologies is interactive television, a distance education learning environment that allows live two-way audio and video communication between teacher and students at multiple sites. In this way, technology can help overcome the barriers of cost and equity of access for students while it also offers an interactive environment similar to traditional education (Hezel & Dirr, 1991). Students also see interactive television classes as an opportunity to learn in new and exciting ways. Besides, they see it as a chance to interact with students from other
schools and as an enjoyable experiment with the equipment (Larson, 1991, p. 6).

Further, teachers and administrators view interactive television as an opportunity to use technology to enable students to benefit from classes which might otherwise be dropped from the curriculum due to small enrollments. In other words, interactive television maintains a strong diverse curriculum in spite of operating costs, funding cuts and declining enrollments (Haberer, 1982). In some cases, it is used as a supplement tool for the enhancement of learning, such as providing access to the Internet (Sorensen & Sweeney, 1994). Administrators also realize that interactive television can be used for meetings between teachers in different buildings and for district-wide committees (Larson, 1991, p. 6).

In addition, teachers believe that teaching on interactive television is as effective as it is in a regular classroom. Because the teacher and the students can see and hear one another simultaneously and all students can see and hear one another, the televised class goes on much as would a normal traditional class (Haberer, 1982, p. 31). According to Piirto (1993) interactive television has enjoyed success because it meets students' needs for convenience and quality in education. Also it breaks down the barriers of time and distance. Several studies have indicated that limitations placed on interaction did not reduce student learning as
measured by the course examinations (Clark 1983; Beare 1989; Simonson 1995).

Garrison (1990) believed that the quality and integrity of the distance educational process is based on the two-way communication. This kind of communication between student and teacher and between student and student is the major benefit of interactive television (p. 15). Bauer and Rezabek (1992) measured the effects of two-way visual contact on verbal interactivity as an expanded form for interactive television instruction. They found that students who receive two-way audio and video instruction were more likely to interact verbally than students who received audio instruction only.

Holmberg (1986) also stated that in an interactive television learning environment the core of teaching is interaction between the teaching and learning parties (p. 123). The quality of the learning experience depends largely on the ability of the human beings involved to cooperate with one another (Lochte, 1993). Consideration for the students is a determinant of a good interactive television instruction. In this way, teachers get feedback on the learning process and students feel they are being cared for and involved in that process (Lochte, 1993). According to Cyrs (1995) "students never learn from the telecommunications technology. They learn from competent instructors who teach through the technology" (p. 2).

During her personal interview, Amos (1996) stated that in
the actual delivery of the course over the ICN, student welfare should be the uppermost goal. Recognition of being "on camera" may make some students feel apprehension, however, this sensitivity can work positively if students realize that they are team players and advance preparation on their part for each class can contribute to their learning and class effectiveness. Thus, they can lose their camera shyness through meaningful contributions to class discussions. Involvement also is fostered by stressing cooperative learning which can be supported through activities such as group projects/reports (including the linking of students at the origination site with students from remote sites), facsimile materials, phone messages, electronic mail messages and regular mail. In the overall analysis those students enrolled in the course at a remote site may gain considerably relative to their professional goals because they do not suffer personally from the disruption in their lives traveling to campus. Students at the origination site may gain considerably from the interchange with the other students who may very well represent diversity in their educational backgrounds and occupations. Graf (1993) also believed that in general, a friendly, concerned, stimulating environment that is conducive to communication becomes the basis of interaction success.

There are many differences between interactive television instruction and instruction face-to-face. Graf (1993) mentioned that differences are related to planning, delivery
and logistics. Specifically, planning refers to the advance work the teacher needs to do to prepare course content for delivery over a distance. Delivery refers to the means by which remote site students receive the course content. Finally, logistics refers to general things that the teacher and the remote site coordinator do in advance of each telecourse lesson (p. 5).

In her interview, Amos (1996) stated that the Iowa Communications Network as a system for course delivery requires a considerable amount of forethought and advance planning because it is not a medium which lends itself well to "off-the-cuff" teaching. Advance planning should be deliberate relative to class scheduling of topics; parallel organization and amplification of content using a variety of technology such as presentation software (powerpoint) on the computer, overhead, slide projector, films; print materials to support individual study (possibly in form of workbook); and provision of opportunities for interaction between students from remote sites with the origination site. If well planned the class climate can be as positive as in the traditional classroom. Graf (1993) also stated that additional planning and organization by the teacher increase the independent learning opportunities of remote site students and maximize the interactive capabilities of the telecommunication system (p. 12). Furthermore, remote site learners need to be encouraged to be more assertive and more responsible for their
own learning than on campus students (Graf, 1993).

In addition, Johnson (1994) stated that there are three essential elements that students in an interactive television classroom need to keep in mind: a) their participation; b) study skills; and c) contact with the teacher. For classroom activities, students need to be organized better, to be prepared ahead, to ask more questions, to use equipment and handouts. According to Cyrs (1995) an interactive activity usually involves application and critical thinking skills. An interactive activity also needs to be short (five to twenty minutes), maximize involvement, be intensive, to the point, well prepared and results-oriented (p. 16).

Graf (1993) also mentioned that "course materials need to be carefully thought out and planned well in advance" (p. 5). Maehl (1995) supported the idea of planning as well. He believed that good planning can overcome potential management problems. Instructors need to present their materials in a visual fashion and to remain aware of the remote sites' perspective. They also need to encourage interactivity but not to lose sight of their instructional goals (p. 5).

Furthermore, Eastmond (1994) stated that the major difference between successful and unsuccessful distance television instruction is prior planning (p. 97). Beaudoin (1990) believed that the interactive distance education is a learner-centered system with the teacher in a facilitating role. The teacher should attend closely to the learning
process, provide study materials with explanations, provide references and reinforce the students. In addition, the teacher should assume expanded roles not only to teach distance learners but also to organize learning for independent study. Burge and Howard (1991) also suggested that successful teaching in an interactive distance learning environment requires the use of a different set of skills than those used in traditional teaching environment. Schlosser and Anderson (1994) supported the above notion as well. They stated that teaching in a distance education environment is different from the traditional face to face teaching. In the state of Iowa, interactive teleteaching is implemented through the Iowa Communications Network. The next section introduces the concept of the Iowa Communications Network System.

**Distance Education in Iowa**

**The Iowa Communications Network (ICN)**

Distance education using the Iowa Communications Network (ICN) is a form of technology which has been introduced in Iowa. The ICN is the telecommunications system installed by the state of Iowa. It operates its telephone, video and audio transmissions by using fiber optic cable (Media Resource Center, 1994). The ICN is the nation's first and only two-way full motion interactive fiber optic network reaching every county in the state (Iowa Public Television, 1996).

In the first two phases of the development of the fiber
optic network project 104 sites were included. One fiber optic endpoint per county; one endpoint at each of the three state universities; one at Iowa Public Television; and one at the capitol complex. Currently there are 157 video sites connected to the network. The network hub is located in the new Iowa National Guard Armory in Johnston. Part III of the development plan will add 482 sites including public and private school districts, area education agencies and public libraries throughout the state (Iowa Public Television, 1996). In addition, other authorized users will connect more sites to the network. For instance the national guard will add 60 sites through its community lightways project during the fiscal year of 1996. The federal government will add 22 sites for conducting several pilot projects and hospitals will add 20 sites during the next two years (Iowa Public Television, 1996).

Each "endpoint" of the ICN system has the capability of acting either as an origination site or as a remote site. The operational capability at each "endpoint" includes video cameras, a document camera, microphones, and the ICN switching and control equipment (Media Resource Center, 1994). When a student in a remote site presses the button on the microphone to comment or ask a question, the teacher is signaled and the camera in the distant classroom automatically positions itself to the area where the microphone is located. This is one of the capacities of the ICN network which makes it unique.
technologically. Fiber optic technology is chosen for its flexibility and efficiency. Because the main purpose of the ICN is to facilitate distance learning, the use of fiber optics technology is made along with the use of full motion, two-way interactive video (Iowa Public Television, 1996).

**Iowa Communications Network Interactive System**

The ICN is a statewide full-motion interactive fiber optic network. Iowa's distance education system was based on the concept of shared learning. It was designed to be used by teachers and students in learning situations where they can see and hear each other. In this way, origination and remote site students can function as one learning group (Simonson, 1994).

Indeed, the ICN connects colleges, universities and secondary schools throughout the state providing students with opportunities for sharing learning experiences. Further, the ICN not only prepares students for new educational challenges but also builds partnerships among schools. In this way, the ICN itself becomes not only a source of information but also a technological medium which enhances collaboration and interaction (Simonson, 1994).

In Iowa, distance education is used as a medium for educating students of all ages. Teacher educators use two-way interactive teleteaching providing students at both origination and remote sites with experiences so that they
will learn through their own active involvement (Iowa Distance Education Alliance, 1993). In general, interactive distance education is seen as a method of responding to several aspects, such as learners' backgrounds, characteristics, and needs (Iowa Distance Education Alliance, 1993). Teachers' opinions about the ICN are presented through survey reports which were conducted by the Iowa Distance Education Alliance and research studies which were conducted by professionals. The Iowa Distance Education Alliance has been formed as the result of collaborative efforts among teachers and administrators from local school districts, The Iowa Department of Education, Iowa Public Television, Iowa's community colleges, area education agencies, public (regent) and independent colleges and universities (Iowa Distance Education Alliance, 1994).

Iowa Teachers' Opinions about the Iowa Communications Network

According to Sorensen and Sweeney (1994), eight K-12 teachers completed surveys after teaching nine courses over the Iowa Communications Network. Courses which had been taught included: three mathematics, one science, two foreign language, two literacy and one vocational education. The surveys were conducted by the Iowa Distance Education Alliance to examine teachers' opinions about the Iowa Communications Network System. Surveys requested teachers' level of agreement on 22 different statements such as physical layout of
classrooms, quality of equipment, personal skills and abilities, procedures to use the system, communication with remote site students, etc.

All teachers (100%) agreed on the following: 1. the interactive system allows appropriate use of media materials, 2. the equipment in the classroom is of high quality, 3. it is easy to manage the equipment while teaching, 4. technical support is readily available, 5. specific skills are needed for someone to be a successful distance teacher, 6. teachers felt successful in encouraging remote site students to become involved in class activities, 7. teachers were confident in their abilities as interactive television teachers, 8. teaching in an interactive class was a positive experience, 9. distance education is an effective way to learn.

Most teachers (88%) agreed on the following: 1. procedures for using the system are clear and reasonable, 2. the distance classroom allows for experimentation with new teaching techniques, 3. they would encourage colleagues to teach over the system. Also, most of the teachers agreed that: 1. teachers were as effective teaching in an interactive television class as in a regular class (85%), 2. the physical layout of the classroom was conducive to learning (76%), 3. the school is supportive of distance education (75%), 4. remote site students learn as much as origination site students (75%), 5. there was no difficulty getting materials to remote site students (72%), 6. teachers using the system
receive effective training in distance education techniques (71%). In addition, teachers agreed that there were some problematic aspects. These included: 1. preparation of materials takes more time than for regular classes (86%), 2. it was difficult to provide for the social and emotional needs of remote students (72%), 3. technical problems interfered with student learning (51%), 4. there were more discipline problems at remote sites (33%) (Sorensen and Sweeney, 1994, p. 10).

According to Sorensen and Sweeney (1994) in September of 1994 the Iowa Distance Education Alliance conducted a follow-up survey for those who participated in in-service workshops and curriculum institutes. A total of 710 teachers were surveyed and 325 replied (46%). The teachers were asked to rate the adequacy and importance of 19 items related to teachers' use of the ICN for K-12 instruction. The items rated most important were: 1. teacher planning time for distance teaching (61%), 2. proximity of ICN classrooms to school buildings (59%), 3. distance education technical training for teachers (58%), 4. supervision of remote site students (57%), scheduling procedures for the ICN (54%), 5. principal support (50%). The items rated as least adequate were: 1. teacher planning time (84%), 2. extra pay for ICN teaching (77%), 3. teacher released time for distance teaching (76%), 4. school district policies (68%), 5. teacher recognition (67%), 6. scheduling procedures for the ICN (61%).
Teachers were also asked to respond to open-ended questions. They were asked to list the most important issues they believed were important for successful K-12 instructional use of the ICN. Teachers responses were: 1. access to ICN sites and equity in site selection, 2. teacher preparation time and pay for distance teaching, 3. distance education training. Finally, teachers listed three items as issues of greatest concern: 1. access to a site and equity in site selection, 2. the costs of distance education for local schools, 3. teacher preparation time and additional pay for distance teaching (Sorensen and Sweeney, 1994, p. 18).

A study by Merkley, Bozik and Oakland (1996) examined how the support structure (literacy institutes, technology workshops, regional coordinator, local district administration) affects the utilization of distance learning in education among literacy teachers. A specific part of this study concentrated on the stages of awareness and concern about distance education by 30 Iowa K-12 teachers participating in a five-day 1993 Teacher Education Alliance Literacy Institute. Results indicated that 46% of the respondents were aware of and concerned about distance learning in education and they were interested in learning more about the Iowa Communications Network. Other respondents (36%) were concerned about the collaborative aspects of distance learning (Merkley, Bozik and Oakland 1996, p. 31).

Another part of the same study concentrated on the level
of use of distance education activities by two teachers who were interviewed. These teachers had submitted detailed monthly logs in which they reported encounters with distance education such as conversations, articles read, lessons prepared and taught, etc. The two interviews indicated that teachers were enthusiastic about distance education and the potential growth of the Iowa Communication Network for both students and teachers. However, teachers reported slow adoption and use of the system. Major reasons which were provided by teachers included: 1. lack of communication among those working with distance education, 2. difficulty scheduling the network, 3. financial concerns, and 4. teacher preparation time (Merkley, Bozik and Oakland, 1996, p. 35).

A study by Torrie and Hausafus (1996) examined the family and consumer sciences and health secondary school teachers' knowledge, ability, and feelings toward the use of interactive distance education when delivering HIV/AIDS programs. A random sample of 265 family and consumer sciences and health teachers in Iowa was selected to participate in the study. From this sample, 85 teachers provided usable responses. Results indicated that teachers' knowledge in relationship to distance education technology was very limited. The fact that only 25% of the teachers had an interactive television classroom in their schools needs to be taken into consideration. Regarding teachers ability, three-fifths of the teachers said they were confident in their
ability to use the technology. However, only five teachers (6%) indicated that they had personally developed interactive teleteaching materials for the classroom. Regarding teachers feelings toward teleteaching technology, nearly a third of the teachers felt that teleteaching technology will help HIV/AIDS program delivery.

Finally, a study by Torrie and Miller (1996) assessed the knowledge, ability, interests, learning preferences, and beliefs of Iowa secondary vocational teachers toward interactive teleteaching using core competencies (leadership, job-getting/job keeping, entrepreneurship). Three-hundred secondary vocational teachers were selected from a population of 2,420 secondary vocational teachers in Iowa. A stratified sample of 12.4% was drawn from each of the discipline areas such as agriculture, business, home economics/family and consumer sciences, industrial, and marketing. A total of 67 usable responses were returned.

Secondary vocational teachers were asked to indicate first, their level of knowledge relative to teleteaching technology on a five-point scale with one indicating none and five indicating extensive; second, their ability to perform their teaching role in an interactive distance education environment on a five-point scale with one indicating very inadequate and five indicating very adequate; third, their interest in using prepared teleteaching lesson plans on a five-point scale with one indicating absolutely yes and five
indicating absolutely not. Finally teachers were asked to indicate their beliefs whether the core competencies could be taught via distance education on a four-point scale with one indicating strongly believe and four indicating strongly disbelieve.

Results of the study indicated that teachers' knowledge of interactive teleteaching technology was limited (overall mean 2.50). With the exception of integration of academics and technology all the other items were rated low. These items included: 1. creation of teleteaching plans, 2. applications of teleteaching, and 3. equipment used in interactive teleteaching. Their ability to perform their teaching role in an interactive distance education environment was limited as well (overall mean 2.75). With the exception of speaking ability all other items were rated low. These items included: 1. operation of equipment, 2. handling of unexpected technical problems, 3. evaluations of mini-lessons, 4. employment of many teaching strategies, 5. attendance of classroom management at separate sites.

In addition, respondents expressed an interest in using prepared teleteaching materials with a help from resource persons. Particularly, teachers indicated an interest to invite: 1. employers (item mean 1.87), 2. professionals to have interviews with students (item mean 1.93) and quest speakers from business and industry (1.99). They also indicated an interest to collaborate with professionals
within (item mean 2.01) and outside (item mean 2.36) their
discipline.

Describing teachers learning preferences, the majority of
respondents preferred improving their knowledge and skills as
a part of a formal program in a group setting rather than an
individual study. Particularly, respondents preferred to learn
through in-service and from other teachers. Finally,
respondents strongly believed that core competencies such as
leadership (overall mean 2.09), job getting/keeping (overall
mean 2.10), and entrepreneurship (overall mean 1.82) could be
taught across vocational discipline areas in an interactive
teleteaching environment. There are many titles given to
vocational education that are different from state to state.
The next section introduces vocational education in the state
of Iowa. Telecommunication policies for instructional purpose
which have an effect on vocational education curriculum are
presented as well.

**Iowa vocational education and instructional telecommunications**

According to the Iowa Department of Education, vocational
education refers to a) agricultural education, b) business
education, c) home economics/family and consumer sciences,
d) distributive education, e) technical education,
and f) trade and industrial education (Iowa Distance Education
Alliance, 1993). Vocational education is strongly influenced
by federal and state legislation. Iowa legislation (Senate
File 449) effective July 1992, provides for equal access to a number of programs. The Iowa legislation specifies program characteristics, competencies, minimum requirements, evaluation, and duties of regional and merged boards. Iowa requires vocational education programs for 7th and 8th grade students and programs for high schools and adults (Iowa Department of Education, 1994).

The Iowa Administrative Code (1993) chapter 15 subsection 256, refers to the policy statements relative to the use of telecommunications in school districts that have an effect on vocational education curriculum. Based on these statements, each board of a local school district should develop policies when the school district uses telecommunications for instructional programs. The local school district is responsible for reporting annually to the Department of Education. This report will include: a) to whom the instruction is delivered, including class size; type of class and grade level; b) the course description and schedule of instruction; c) the number, assignment, licensing folder number and the training received regarding effective practices which enhance learning by telecommunications. Family and consumer sciences programs as part of the overall vocational education curriculum are influenced by the policy statements relative to the use of telecommunications for instructional purposes.
Family and Consumer Sciences Programs

Family and consumer sciences programs in Iowa

Family and consumer sciences programs formerly home economics with their emphasis on families have been part of the secondary school curriculum for over 75 years (Iowa Department of Education, 1993, p. HE-9). These programs prepare students for the multiple roles of family member, worker, citizen, and community member (Iowa Department of Education, 1993, p. HE-9). Family and consumer sciences content includes: a) housing and home management; b) food and nutrition; c) individual and family health; d) family living and parenthood; e) consumer education; f) textiles and clothing; and g) child development (Iowa Department of Education, 1993).

Family and consumer sciences is the only curriculum area that focuses entirely on practical living skills related to family life. Its goal is to improve the quality of individual and family life developing knowledge and skills in different areas such as: a) housing choices; b) food choices; c) health; d) personal and family communication; e) consumer decision making; f) clothing choices, and f) parenting (Iowa Department of Education, 1993, p. HE-9). Some of the concepts which are emphasized include the development of positive self-esteem, understanding personal growth and relationships with peers and family members in the home, school and community (Iowa Department of Education, 1994).
The importance of family and consumer sciences programs is based on the fact that everyone needs practical living skills for successful family life and work outside the family. With family and consumer sciences programs students are prepared to tie together work and family life (Iowa Department of Education, 1993).

Two basic criteria are required for the development of family and consumer sciences programs in order to meet the Iowa vocational standards:

a) a district must offer and teach at least three sequential units within the family and consumer sciences/home economics service area

b) the program sequence must include one set of the minimum competencies from the family and consumer sciences/home economics education service area. It is expected the program will go beyond the minimum competencies (Iowa Department of Education, 1993, p. HE11). When a local district establishes family and consumer sciences programs, community and student needs are the main factors guiding and planning program competencies. The state of Iowa does not define the specific program but rather local autonomy is responsible for the development of programs (Iowa Department of Iowa, 1993, p. HE-11).

According to the Iowa Department of Education (1993) competencies function as the basis for building the
instructional program. These are defined as "learned behaviors which can be accurately repeated and measured to a predetermined standard" (p. 5). All secondary and postsecondary vocational programs are competency-based. That is the teachers evaluate students based on their ability to perform the competencies. However, only the secondary vocational programs have state minimum competency lists for each service area (p. 5).

Furthermore, competencies are validated by the statewide technical committees composed of representatives from appropriate businesses and industries. These lists contain competencies common to a number of occupations in a particular service area. Finally, districts are responsible for choosing one set of competencies per service area to include in their specific vocational program (Iowa Department of Education, 1993, p. 7). The service areas in vocational education are: a) agricultural education; b) business/office education; c) health occupations education; d) family and consumer sciences/home economics education; e) industrial education; f) marketing education (Iowa Department of Education, 1994).

Competencies that have been identified for each occupational cluster within the family and consumer sciences/home economics service area are: a) family and consumer sciences; b) occupational child care; c) occupational textiles and clothing; d) occupational food production and services; e) occupational home furnishings; f) occupational
home management (Iowa Department of Education, 1994, p. 3). Each sequential unit within an occupational cluster must include competencies related to the following: a) new and emerging technologies; b) job keeping, self-employment and entrepreneurial skills; and c) basic academic skills (Iowa Department of Education, 1994). In an effort to understand the development of the Iowa family and consumer sciences competencies an examination of the development of the Iowa vocational education competencies is provided in the next section.

**Development of Iowa family and consumer sciences competencies**

In the state of Iowa the process for developing competencies is established by the subrule 281.46.7 in the administrative rules and regulations (Iowa Department of Education, 1993, p. 6). The development of Iowa secondary vocational education competencies including family and consumer sciences competencies is based on the taxonomy of Basic/Essential Skills. The taxonomy of Basic/Essential Skills is a project based on the Basic/Essential Skills Lists provided by 18 states (Alabama, Arizona, Arkansas, Colorado, Florida, Georgia, Illinois, Kentucky, Michigan, Mississippi, New York, North Carolina, Oregon, South Carolina, Tennessee, Utah, Virginia and Washington) (Snyder, 1989, p. 8). Items included on the individual state lists are included in the taxonomy at approximately a 90% rate (p. 3).
According to Snyder (1989) the purpose of this united effort project was "to develop a procedure that would enable educators to compare curriculum goals and objectives that were based on a variety of philosophical positions and presented in a variety of formats" (p. 3). Ideas from subject matter specialists and validation of listings from business and industry people were used in the construction of the taxonomy of Basic/Essential Skills. Resource materials such as textbooks, standardized tests, and curriculum materials were used as well (p. 8). The uniqueness of this taxonomy lies in the fact that each skill is presented with a verb that indicates the function that a student is expected to perform. Whereas the traditional competency-based approach groups competencies under specific objectives (Snyder, 1989, p. 3).

As Snyder (1989) further stated, the taxonomy can be used as a powerful tool for several purposes. First, it can be used in originating dialogue between subject matter experts, policy makers, business and industry representatives and parents (p. 5). Secondly, it can be used during the development of curriculum materials and curriculum projects (p. 5). Finally, it can be used for originating dialogue regarding the skills to be taught and evaluating the level of mastery of the materials taught in a subject area (p. 5).

The Iowa Department of Education used the aforementioned taxonomy to develop the vocational education competencies with a specific goal. This is to provide all students with
opportunities which enable them to live in a global society, to compete in a world market work force and to receive lifelong learning (Iowa Department of Education, 1993, p. 1).

Summary

In conclusion, the term distance education has a variety of meanings because it has been used as a medium for teaching in many different forms. In the state of Iowa distance education is implemented through the Iowa Communications Network System (ICN). This system permits two-way audio and video communications between ICN sites. Currently there are 157 video sites connected to the network. A future development plan will include more sites connecting public and private school districts, area education agencies and public libraries throughout the state (Iowa Public Television, 1996).

Interaction between teacher and students and among students themselves is one of the components of the ICN. According to Souder (1993) "the distance learners gained a broad network of valuable colleagues, skills in working with others and collaborating across distances, and many social skills beyond those offered by traditional classroom settings" (p. 50).

Teachers' opinions about the ICN were presented through survey reports conducted by the Iowa Distance Education Alliance and research studies conducted by professionals. One of the reports referred to eight K-12 teachers who completed
the Iowa Distance Education Alliance surveys after teaching nine courses over the Iowa Communication Network. All teachers (100%) agreed that the interactive system allows the use of media materials and that equipment in classroom is of high quality. Regarding their abilities, teachers were confident as interactive television teachers. Finally, they agreed that distance education is an effective way to learn. Most of the teachers (88%) agreed that procedures for using the system are clear and reasonable, the distance education allows for experimentation with new teaching techniques, and they would encourage colleagues to teach over the system. Also, most of the teachers (75%) agreed that the school is supportive of distance education and remote site students learn as much as the origination site students. This notion is described by Clark (1983) who stated that "media are mere vehicles that deliver instruction but do not influence student achievement any more than the truck that delivers our groceries causes changes in nutrition" (p. 445). In addition, teachers identified some aspects which were problematic such as preparation of materials takes more time than for regular classes (86%) and it was difficult to provide for the social and emotional needs of remote students (72%).

According to Sorensen and Sweeney (1994) in September of 1994 the Iowa Distance Education Alliance conducted a follow-up survey for those who participated in service workshops and curriculum institutes. A total of 710 teachers
were surveyed and 325 replied (46%). The items rated as most important were planning time for distance teaching, proximity of ICN classrooms to school buildings, and technical training for teachers. The items rated as least adequate were teacher planning time, extra pay for ICN teaching, and teacher release time. Aspects which were listed as issues of great concern were: 1. access to a site and equity in site selection, 2. the costs of distance education for local schools, and 3. teacher preparation time and additional pay.

From the Merkley, Bozik and Oakland (1996) research study results indicated that 46% of 30 K-12 teachers who participated a five-day 1993 Teacher Education Alliance Literacy Institute were aware of and concerned about interactive learning. Two teachers who were interviewed from the above group of teachers indicated enthusiasm about the potential growth of the ICN; however, they reported slow adoption and widespread use of the system.

Based on the Torrie and Hausafus (1996) study, results indicated that teachers (secondary school family and consumer sciences and health) knowledge toward interactive teleteaching was limited. Further, only 6% of the teachers had experience in developing materials for interactive teleteaching. However, teachers feelings indicated that interactive teleteaching will help HIV/AIDS program delivery.

Finally, on the Torrie and Miller (1996) study, results indicated that teachers (secondary vocational teachers)
knowledge in relation to interactive teleteaching was limited. With the exception of integration of academics and technology all other items were rated low. For teachers ability to perform their teaching role, results indicated that with the exception of speaking ability all other items were rated low. Teachers also indicated interest in preparing materials with help from resource persons such as employers, professionals and guest speakers from business and industry. They also wanted to collaborate with professionals outside and within their discipline.

For better understanding of the development of the Iowa family and consumer sciences competencies a review of the development of the Iowa vocational education competencies had been provided. A special emphasis had been given to the family and consumer sciences programs in the state of Iowa.

This research was designed to identify only the family and consumer sciences secondary school teachers' knowledge, ability, interests, feelings, beliefs, and teaching preferences toward the use of interactive distance education technology when using curriculum competencies. The first study focuses on the family and consumer sciences secondary school teachers' self reported knowledge, ability, interests, feelings and teaching preferences toward the use of interactive teleteaching. The second study particularly focuses on family and consumer sciences secondary teachers' beliefs whether curriculum competencies can be taught via
interactive teleteaching. The results of these studies will be used by family consumer sciences teacher educators and curriculum specialists as they plan to develop future resources in the area of interactive distance education technology.

References


CHAPTER 2. FAMILY AND CONSUMER SCIENCES SECONDARY SCHOOL
TEACHERS' ORIENTATIONS TOWARD DISTANCE EDUCATION TECHNOLOGY

A paper to be submitted to the Journal of Family and
Consumer Sciences Education

Lemonia N. Bigilaki and Margaret Torrie

Abstract

The purpose of this study was to identify the family and
c consumer sciences secondary school teachers' self-reported
knowledge, ability, interests, feelings, and teaching
preferences toward the use of interactive teleteaching
technology. Analyses were conducted to determine: a) if there
were differences among family and consumer sciences secondary
school teachers' levels of knowledge, ability, interests and
feelings when compared to their years of experience (years as
an educator); b) if there were differences among family and
consumer sciences secondary school teachers' levels of
knowledge, ability, interests and feelings when compared to
their education (highest degree held). Results indicated no
significant differences among family and consumer sciences
secondary school teachers' knowledge, ability, interests and
feelings when compared to their years of experience. Further,
results indicated no significant differences between family
and consumer sciences teachers' levels of knowledge, ability,
and feelings when compared to their education. However,
significant differences were revealed between family and
consumer sciences secondary school teachers' interests when
compared to their education. Those who held a master's degree showed a higher level of interests than those who held only a bachelor's degree. Results also indicated that the majority of teachers prefer to teach with one or two remote sites followed by those who prefer to teach with three to five. Very few prefer to teach with six or more remote sites.

Introduction

What is distance education and how is distance education implemented in the state of Iowa

Brown and Brown (1994) stated that the concluding decade of the 20th century is the time of change from the institutional learning of the past centuries to the open education that occurs at a time and place suitable to the learner (p. 3). Media and communications technology helped this change in education. Video, audio, voice and data have fused into a single electric channel simplifying the delivery systems that support educational needs of distance education (p. 35).

There are many definitions given to distance education. Some of these definitions refer to the physical separation between students and teacher (Perraton, 1988; Rumble, 1989; Hoyle, 1996). Some others refer to the application of two-way communication (Keegan, 1988a; Garrison & Shale; 1987). The Office of the United States Department of Education defined distance education as the application of telecommunications
and electronic devices which make learners able to receive instruction that originates from some distant location (Bruder, 1989, p. 30).

According to Simonson and Schlosser (1995) distance education in Iowa implies formal, institutionally based educational activities where the teacher and learner are normally separated from each other in location but not normally separated in time, and where two-way interactive telecommunication systems are used for the sharing of video, data, and voice instruction (p. 13).

The Iowa Communications Network (ICN) is the nation's first and only two-way full motion interactive fiber optic network reaching every county in the state (Iowa Public Television, 1996). In the first two phases of the development of Iowa's fiber optic network project 104 sites were included. Currently there are 157 video sites connected to the network. The network hub is located in the new Iowa National Guard Armory in Johnston. Part III of the development plan will add 482 sites including public and private school districts, area education agencies and public libraries throughout the state (Iowa Public Television, 1996).

Each site of the ICN system has the capability of acting either as an origination site or as a remote site. The operational capability at each site includes video cameras, a document camera, microphones and the ICN switching and control equipment (Media Resource Center, 1994). When a student in a
remote site presses the button on the microphone to comment or ask a question, the teacher is signaled and the camera in the distant classroom automatically positions itself to the area where the microphone is located. This is one of the capacities of the ICN network which makes it unique technologically (Iowa Public Television, 1996).

Iowa's distance education system was based on the concept of shared learning. The ICN itself becomes a source of information, a technological medium which enhances collaboration and interaction (Simonson, 1994). Teachers use the ICN to provide students at both origination and remote sites with experiences so that they will learn through their own active involvement (Iowa Distance Education Alliance, 1993).

**Iowa Teachers' Opinions about ICN**

Teachers opinions about Iowa Communications Network are presented first through survey reports conducted by the Iowa Distance Education Alliance and secondly through research studies conducted by professionals. The Iowa Distance Education Alliance has been formed as the result of a collaborative effort of teachers and administrators from local school districts, The Iowa Department of Education, Iowa Public Television, Iowa's community colleges, area education agencies, public (regents) and independent colleges and universities (Iowa Distance Education Alliance, 1994).
Sorensen and Sweeney (1994) reported that eight K-12 teachers completed surveys after teaching nine courses over the Iowa Communications Network. Courses which had been taught included: three mathematics, one science, two foreign language, two literacy and one vocational education. The surveys were conducted by the Iowa Distance Education Alliance to examine teachers' opinions about the Iowa Communications Network System. Surveys requested teachers' level of agreement on 22 different statements such as physical layout of classrooms, quality of equipment, personal skills and abilities, procedures to use the system, communication with remote site students, etc.

All teachers (100%) agreed on the following: 1. the interactive system allows appropriate use of media materials, 2. the equipment in the classroom is of high quality, 3. it is easy to manage the equipment while teaching, 4. technical support is readily available, 5. specific skills are needed for someone to be a successful distance teacher, 6. teachers felt successful in encouraging remote site students to become involved in class activities, 7. teachers were confident in their abilities as interactive television teachers, 8. teaching in an interactive class was a positive experience, 9. distance education is an effective way to learn.

Most teachers (88%) agreed on the following: 1. procedures for using the system are clear and reasonable, 2. the distance classroom allows for experimentation with new
teaching techniques, 3. they would encourage colleagues to teach over the system. Also, most of the teachers agreed that:
1. teachers were as effective teaching in an interactive television class as in a regular class (85%), 2. the physical layout of the classroom was conducive to learning (76%), 3. the school is supportive of distance education (75%), 4. remote site students learn as much as origination site students (75%), 5. there was no difficulty getting materials to remote site students (72%), 6. teachers using the system receive effective training in distance education techniques (71%).

In addition, teachers agreed that there were some problematic aspects. These included: 1. preparing materials takes more time than for regular classes (86%), 2. it was difficult to provide for the social and emotional needs of remote students (72%), 3. technical problems interfered with student learning (51%), 4. there were more discipline problems at remote sites (33%) (Sorensen and Sweeney, 1994, p. 10).

According to Sorensen and Sweeney (1994) in September of 1994 the Iowa Distance Education Alliance conducted a follow-up survey for those who participated in in-service workshops and curriculum institutes. A total of 710 teachers were surveyed and 325 replied (46%). The teachers were asked to rate the adequacy and importance of 19 items related to teachers' use of the ICN for K-12 instruction. The items rated most important were: 1. teacher planning time for distance
teaching (61%), 2. proximity of ICN classrooms to school buildings (59%), 3. distance education technical training for teachers (58%), 4. supervision of remote site students (57%), scheduling procedures for the ICN (54%), 5. principal support (50%). The items rated as least adequate were: 1. teacher planning time (84%), 2. extra pay for ICN teaching (77%), 3. teacher released time for distance teaching (76%), 4. school district policies (68%), 5. teacher recognition (67%), 6. scheduling procedures for the ICN (61%).

Teachers were also asked to respond to open-ended questions. They were asked to list the most important issues for successful K-12 instructional use of the ICN. Teachers responses were: 1. access to ICN sites and equity in site selection, 2. teacher preparation time and pay for distance teaching, 3. distance education training. Finally, teachers listed three items as issues of greatest concern: 1. access to a site and equity in site selection, 2. the costs of distance education for local schools, 3. teacher preparation time and additional pay for distance teaching (Sorensen and Sweeney, 1994, p. 18).

A study by Merkley, Bozik and Oakland (1996) examined how the support structure (literacy institutes, technology workshops, regional coordinator, local district administration) affects the utilization of distance learning in education among literacy teachers. A specific part of this study concentrated on the stages of awareness and concern
about distance education by 30 Iowa K-12 teachers participating in a five-day 1993 Teacher Education Alliance Literacy Institute. Results indicated that 46% of the respondents were aware of and concerned about distance learning in education and they were interested in learning more about the Iowa Communications Network System. Other respondents (36%) were concerned about the collaborative aspects of distance learning (Merkley, Bozik and Oakland 1996, p. 31).

In the same study, the level of use of distance education activities was examined. Two teachers were interviewed. These teachers had submitted detailed monthly logs in which they reported encounters with distance education such as conversations, articles read, lessons prepared and taught, etc. The two interviews indicated that teachers were enthusiastic about distance education and the potential growth of the Iowa Communication Network for both students and teachers. However, teachers reported slow adoption and use of the system. Reasons provided by teachers indicated the following: 1. lack of communication among those working with distance education, 2. difficulty scheduling the network, 3. financial concerns, and 4. teacher preparation time (Merkley, Bozik and Oakland, 1996, p. 35).

A study by Torrie and Hausafus (1996) examined the family and consumer sciences and health secondary school teachers' knowledge, ability, and feelings toward the use of
interactive distance education when delivering HIV/AIDS programs. A random sample of 265 family and consumer sciences and health teachers in Iowa was selected to participate in the study. From this sample, 85 teachers provided usable responses. Results indicated that teachers' knowledge relative to distance education technology was very limited. However, only 25% of the teachers had an interactive television classroom in their schools. Regarding teachers' ability, three-fifths of the teachers said they were confident in their ability to use the technology. However, only five teachers (6%) indicated that they had personally developed interactive teleteaching materials for the classroom. Teachers' feelings toward teleteaching technology, indicated that nearly a third of the teachers felt that teleteaching technology will help HIV/AIDS program delivery.

Finally, a study by Torrie and Miller (1996) assessed the knowledge, ability, interests, and learning preferences of secondary vocational teachers. Three-hundred secondary vocational teachers were selected from a population of 2,420 secondary vocational teachers in Iowa. A stratified sample of 12.4% was drawn from each of the discipline areas such as agriculture, business, home economics/family and consumer sciences, industrial, and marketing. A total of 67 usable responses were returned. Secondary vocational teachers were asked to indicate first, their level of knowledge relative to teleteaching technology on a five-point scale with one
indicating none and five indicating extensive; second, their ability to perform their teaching role in an interactive distance education environment on a five-point scale with one indicating very inadequate and five indicating very inadequate; and third, their interest in using prepared teleteaching lesson plans on a five-point scale with one indicating absolutely yes and five indicating absolutely not.

Results of the study indicated that teachers' knowledge of interactive teleteaching technology was limited (overall mean 2.50). With the exception of integration of academics and technology all the other items were rated low. These items included: 1. creation of teleteaching plans, 2. applications of teleteaching, and 3. equipment used in interactive teleteaching. Teachers ability to perform their role in an interactive distance education environment was limited as well (overall mean 2.75). With the exception of speaking ability all other items were rated low. These items included: 1. operation of equipment, 2. handling of unexpected technical problems, 3. evaluations of mini-lessons, 4. employment of many teaching strategies, 5. attendance to classroom management at separate sites.

In addition, respondents expressed an interest in using prepared teleteaching materials with help from resource persons. Particularly, teachers indicated an interest to invite: 1. employers (item mean 1.87), 2. professionals to have interviews with students (item mean 1.93) and guest
speakers from business and industry (item mean 1.99). They also indicated an interest in collaborating with professionals within (item mean 2.01) and outside (item mean 2.36) their discipline.

Describing teachers learning preferences, the majority of respondents preferred improving their knowledge and skills as a part of a formal program in a group setting rather than an individual study. Particularly, respondents preferred to learn through in-service and from other teachers.

Need for the Study

Concentration on teachers as an investigation group for this study is based on the fact that although it is technology that removes the barriers and expands opportunities for learning, it is the teacher who teaches (United States Congress, 1989, p. 11). According to Stewart (1996) the next decade will be a period of rapid change regarding the use of technology in family and consumer sciences. Improved hardware and software will enhance the integration of technology such as laser disks, interactive video, and distance learning facilities. Findings of her research review indicated a continuing necessity for in-service education for family and consumer sciences teachers regarding integration of technology (p. 258). Anderson (1996) stated that successful operation of a distance learning classroom requires the knowledge, ability, skills, and cooperation of a number of individuals. One of
them is the teacher. The teacher is responsible for class content, design and delivery of instruction, degree of interactivity, and students evaluation at all remote sites and the origination site. Also, Collis, Veen, and De Vries (1993) stated that necessary knowledge and skills are required for distance education teachers in order to be effective.

The aforementioned reports surveys and research studies which examined knowledge, ability, interests, and learning preferences of teachers toward interactive teleteaching were conducted using K-12 teachers, secondary family and consumer sciences and health teachers, and secondary vocational teachers as their population samples. However, there were no studies found in this regard which examined family and consumer sciences secondary school teachers only. Thus, there was a need to identify family and consumer sciences secondary school teachers' knowledge, ability, interests, feelings, and teaching preferences toward interactive teleteaching.

**Purpose**

The purpose of this study was to identify the family and consumer sciences secondary school teachers' self reported knowledge, ability, interests, feelings and teaching preferences toward interactive teleteaching. Two major research questions were:

1. Does years of experience of family and consumer sciences secondary school teachers have an effect on
their knowledge, ability, interests, feelings and teaching preferences?

2. Does educational level of family and consumer sciences secondary school teachers have an effect on their knowledge, ability, interests, feelings and teaching preferences?

**Materials and Methods**

**Data Collection Instruments**

This study was descriptive in nature and involved the use of a mailed questionnaire. The questionnaire was developed by the researcher after an extensive review of literature and careful consideration of studies over the Iowa Communications Network. The questionnaire was reviewed by a panel of experts and pilot-tested by students (undergraduate and graduate) in the Department of Family and Consumer Sciences at Iowa State University. The panel of experts examined both evidence of the questionnaire's construct-related and content-related validity.

The questionnaire contained three parts. Only two parts of the questionnaire are the basis for this journal article. The first part assessed knowledge relative to interactive teleteaching, ability to use interactive teleteaching technology, interests in using prepared lesson plans with the help of other professionals, and feelings toward interactive teleteaching and family and consumer sciences courses. The
second part of the questionnaire requested information about
the respondents' professional development and current
professional responsibilities including interactive
teleteaching pedagogy. It also requested information about
teachers' preferences regarding the acquisition and
improvement of their skills in teleteaching. The questionnaire
was designed to assess knowledge, ability, interests,
feelings, and teaching preferences based on teachers' responses. Therefore, all the aforementioned constructs were
recognized as self-reported ones.

Instead of answering directly on the questionnaire,
teachers were provided an answer sheet which was machine
scored. They responded by darkening a number between one and
five on the machine scored answer sheet for each of the
statements on the questionnaire.

For teachers knowledge, none was coded a number one, very
little a two, some a three, quite a bit a four and extensive a
five. For teachers ability very inadequate was coded a number
one, inadequate a two, unknown a three, adequate a four and
very adequate a five.

For teachers interests, absolutely not was coded a number
one, probably not a two, not sure a three, probably yes a four and
absolutely yes a five. For teachers feelings, strongly
disagree was coded a number one, somewhat disagree a two,
neither agree or disagree a three, somewhat agree a four and
strongly agree a five. In the second part for teachers
professional development, professional responsibilities and preferences, do apply was coded a number one and do not apply a number five.

In this study, the term orientations embraces all the measuring constructs such as knowledge, ability, interests, feelings, and teaching preferences.

Identification of the Population and Sample

A random selection approach was used in order to be more representative of a large number of respondents in diverse geographical areas within the state of Iowa. Two hundred fifty from a total of 445 family and consumer sciences secondary school teachers were selected by a computerized random selection technique from the 1994-95 Iowa Educational Directory List Data Base (Iowa Department of Education, 1995).

Data collection began in December, but was halted during December and January as the holidays and semester changes are a busy time in schools. Data collection resumed in February and lasted until March. During February and the beginning of March the researcher followed up with a phone call. All 250 teachers were included in the first phase of the follow up phone call. At the end of the first phase of the follow up phone call, 40 teachers were sent an additional packet of materials. During the second phase of the follow up phone calls to an additional 40 teachers, numerous comments were made regarding their general lack of experience and
unfamiliarity with the Iowa Communications Network System. These attitudes contributed to the response rate. Finally, 112 teachers (45% of the invited sample) became the data producing sample of this study.

Data Analysis

The completed answer sheets were coded in a manner suitable for statistical analysis. A special code was used to identify each item of the questionnaire in the statistical analysis. All answer sheets were optically scanned and responses on the answer sheets were transferred to a computer data file.

Statistical analysis was performed using version 4.1 of SPSS computer program. Descriptive statistics, means and standard deviations were calculated for all items. Frequencies were calculated for years of experience (years as an educator), education (highest degree held), professional responsibilities (attendance and learning), and preferences (learning and teaching).

Reliabilities were also computed for the four orientation scales (knowledge, ability, interests, feelings). In addition, Pearson correlations for interval variables such as knowledge, ability, interests, and feelings were calculated. Finally, one-way analyses of variance (ANOVA) were calculated for variables such as knowledge, ability, interests, and feelings when comparing groups of varying years of experience (years as
an educator). In addition, t-tests were calculated for variables such as knowledge, ability, interests, and feelings when comparing groups of varying education (highest degree held). For the aforementioned statistical analyses such as analysis of variance (ANOVA) and t-tests, the level of significance was 0.05.

Results and Discussion

Profile of participants

A total of 112 usable responses were returned to the researcher, a response rate of 45%. The majority of respondents (41%) reported that they had taught 11 to 20 years. Twenty-one of the respondents (19%) had 10 or fewer years of teaching experience. Thirty-eight of the respondents (34%) reported 21 to 30 years. Finally, only seven of the respondents (6%) had 31 or more years of experience.

More than two-thirds of the respondents (69%) indicated their highest level of formal education as a Bachelor's degree and about one-third (31%) held a Master's degree. None of the participants had a Ph.D. degree.

Forty-four of the respondents (39%) had attended an "in-house" area education agency training session on teleteaching distance education. According to Iowa Distance Education Alliance (1994) in the state of Iowa there are 15 area education agencies which collaborate with teachers and administrators from local schools to plan for staff
development, in-service activities, and course offerings.

Eight teachers (7%) had attended a Star Schools in-service workshop on teleteaching methodology. Sorensen and Sweeney (1994) explained that in-service workshops on distance education were held around the state for two years (1992-1994). These workshops were held at more than 35 sites and provided participants with hands-on experience with interactive teleteaching technology (p. 15).

Finally, only five teachers (5%) had attended an in-service on distance education through the Star Schools Vocational Curriculum Institutes. Sorensen and Sweeney (1994) stated that the goal of the curriculum institutes was to familiarize Iowa K-12 teachers with the most recent curriculum reform efforts. Sessions were conducted in five content areas such as mathematics, science, foreign language, literacy, and vocational education (p. 13). Approximately 50% of the respondents had not attended any formal presentation on interactive teleteaching.

When asked how they have learned to use the teleteaching classroom 33 teachers (30%) indicated they had learned from other teachers and 32 of the respondents (29%) had learned through in-service. Nineteen of the respondents (17%) were self-taught from printed materials and 10 (9%) had learned from technicians. Eight teachers (7%) indicated learning from a graduate teacher education course and only two (2%) had learned from a preservice teacher education course.
When asked how they would prefer to learn about and improve their skills in the teleteaching classroom 99 teachers (88%) responded through in-service and 96 teachers (86%) responded from other teachers. Two-thirds of the teachers (66%) preferred to learn from technicians followed by teacher education courses at the graduate level (52%) and preservice (40%). More than a third of participants preferred to learn from a how-to-do it videotape and only 21 teachers (19%) preferred printed materials.

When asked how they would prefer to teach a teleteaching interactive class, sixty-seven of the teachers (60%) preferred to teach with one or two simultaneous sites followed by three to five sites (22%) and six or more (8%). In addition, more than two-thirds (68%) preferred team teaching followed by turn teaching (63%). Team teaching is the situation where each teacher is involved at all instructional sessions and turn teaching where each teacher involved takes responsibility for a segment of the class (see Table 1).

____________________

Place Table 1 About Here

____________________

Interactive Teleteaching Technology

Part one of the questionnaire explored teachers' self reported knowledge, ability, interest, and feelings toward
interactive teleteaching. Four sections were designed. The first focused on teachers' knowledge in relation to interactive teleteaching. The second asked teachers their ability to perform their teaching role in an interactive teleteaching environment. The third section requested teachers' level of interest in using prepared teleteaching materials that require the use of professionals within and outside their discipline. The fourth section focused on teachers feelings about family and consumer sciences courses and interactive teleteaching.

As indicated in Table 2, respondents were asked to indicate their level of knowledge relative to distance education interactive teleteaching, integration of academics and technology into family and consumer sciences, interactive teleteaching equipment, applications of interactive teleteaching to family and consumer sciences, and creations of teleteaching plans for distance education. The response scale for teachers knowledge ranged from none (1) to extensive (5). Item means ranged from 1.58 to 2.80 and the overall mean for the section was 2.15. The item teachers knew the least about was how to create teleteaching plans for distance education (item mean 1.58). The item teachers knew the most about was techniques to integrate academics and technology into family and consumer sciences (item mean 2.80). The second item teachers knew something about was distance education interactive teleteaching technology (item mean
Table 2 summarizes teachers' self-rated ability to perform their teaching role in an interactive teleteaching environment. Eight items were listed for teachers to consider, with a response pattern ranging from very inadequate (1) to very adequate (5). Teachers rated themselves weakest in their ability to handle the unexpected technical problems with ease (item mean 2.09) and highest in their ability to speak clearly with adequate volume and tone appropriate for teleteaching (item mean 3.32). With the exception of speaking ability all other items were rated inadequate to unknown. The overall mean score for these items was 2.50.

Teachers' interest in using prepared teleteaching materials which require the use of resource persons (professionals within and outside their discipline) were summarized also in Table 2. The response scale ranged from absolutely not (1) to absolutely yes (5). The item means ranged from 3.57 to 4.01. The overall mean for the section was 3.87. With the exception of guest speaker from an outside agency (item mean 4.01) all other items were rated not sure to probably yes.

Teachers' feelings about family and consumer sciences courses and interactive teleteaching instructional techniques were summarized in Table 2 as well. The response scale ranged from strongly disagree (1) to strongly agree (5). The item means ranged from 2.14 to 3.64. Six items were rated neither
agree or disagree to somewhat agree and the remaining three were rated somewhat disagree to neither agree or disagree. The overall mean score of the section was 3.1 indicating a neutral reaction among teachers.

Place Table 2 About Here

A reliability test was run for the four scales (knowledge, ability, interests, and feelings) to determine their internal consistency. The reliability test for the knowledge scale produced a coefficient alpha of 0.84. The reliability test for the ability scale produced a coefficient alpha of 0.92. For the interests scale the coefficient alpha was 0.86. Finally, for the feelings scale the coefficient alpha was 0.62.

Pearson correlations were calculated for the four scales (knowledge, ability, interests, and feelings) to identify their degree of association. Results indicated that there was a relatively close relationship between knowledge and ability ($r = 0.52$), a relatively close relationship between interests and feelings ($r = 0.42$), and a less close relationship between knowledge and feelings ($r = 0.39$) (see Table 3).
One-way analyses of variance (ANOVA) were run to examine the first major research question. Due to the small number of respondents in four categories (1 to 5, 6 to 10, 21 to 30 and 31 or more years) of the five, three main categories were reproduced for the statistical purposes: 1 to 10 years, 11 to 20, and 21 or more years. One-way ANOVA revealed that there were no significant differences among family and consumer sciences secondary school teachers' knowledge, ability, interests, and feelings when compared to their years of experience (see Table 4).

To examine the second major research question t-tests were run. Not one of the respondents (N=112) held a doctoral degree. Therefore only two groups were examined, those who held a bachelor's degree and those who held a master's degree. Results indicated that there were no significant differences between the family and consumer sciences secondary school teachers' knowledge, ability, and feelings when compared to
their level of education. Because there were no significant differences a pooled variance estimate was recorded. However, there were significant differences between family and consumer sciences secondary school teachers' interests when compared to their education. Those who held a master's degree indicated a higher level of interest than those who held only a bachelor's degree. In this case, because there were significant differences a separate variance estimate was recorded (see Table 5).

Summary and Conclusions

The purpose of this study was to identify the family and consumer sciences secondary school teachers' self-reported knowledge, ability, interests, feelings, and teaching preferences toward the use of interactive distance education technology. The study was descriptive in nature and involved the use of 250 mailed questionnaires. A total of 112 usable responses were returned. From the analysis of the data, the following conclusions are offered:

1. At the time of the study approximately 50% of the participants had not attended any formal presentation on
interactive teleteaching.

2. Thirty-three of the participants (30%) had learned to use teleteaching from other teachers followed by in-service (29%).

3. The majority of the participants (88%) preferred to learn about and improve their skills in the teleteaching classroom through in-service followed by learning from other teachers (86%).

4. Sixty-seven of the participants (60%) preferred to teach with one or two sites followed by three to five (22%). More than two-thirds of the participants (68%) preferred team-teaching.

5. Participants' self-reported knowledge of interactive teleteaching technology was very little.

6. Participants' self-reported ability to perform their teaching role in an interactive teleteaching environment was inadequate.

7. Participants' self-reported interest in using prepared teleteaching materials and collaborating with professionals within and outside their discipline was unknown.

8. Participants' self-reported feelings about family and consumer sciences courses and interactive teleteaching instructional techniques indicated a neutral reaction.

9. Participants' years of experience (years as an educator) does not have an effect on their knowledge, ability, interests, and feelings.

10. Participants' education (highest degree held) does not
have an effect on their knowledge, ability, and feelings. It
does have an effect on their interests. Those who held a
master's degree indicated a higher level of interest than
those who held only a bachelor's degree.

In a cross examination of research studies, results of
this study support the findings of the Torrie and Miller
(1996) study on three facts: a) both family and consumer
sciences and vocational teachers knowledge relative to
interactive teleteaching was limited; b) family and consumer
sciences and vocational teachers ability to perform their
teaching role in an interactive teleteaching environment was
limited; c) family and consumer sciences and vocational
teachers prefer to learn through in-service and from other
teachers. Also findings of this study support the findings of
the Torrie and Hausafus (1996) study on the fact that family
and consumer sciences and health teachers' knowledge relative
to interactive teleteaching technology was limited.

From the results of this study, it is apparent that
family and consumer sciences secondary school teachers report
limited information about interactive teleteaching technology.
Also from the results of this study, it is apparent that
teachers reported a preference to learn about teleteaching
through in-service and from other teachers. Because teachers
indicated that they prefer learning about teleteaching through
in-service and from other teachers, additional training and
collaboration among them may be an effective process.
Finally, it is also apparent that family and consumer sciences teachers with only a bachelor's degree indicated lower interest than those who held a master's degree in using prepared materials with the help of resource persons and collaborating with professionals.

References


Media Resources Center (1994). ICN scheduling procedures: Scheduling the Iowa communications network at Iowa State University. Ames, IA: Media Resources Center, Iowa State University.


Table 1. Frequencies and percentages of teachers' years of experience, education, and professional responsibilities

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>DO APPLY*</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>n</td>
</tr>
<tr>
<td>Years as an educator:</td>
<td></td>
</tr>
<tr>
<td>1-5 years</td>
<td>10</td>
</tr>
<tr>
<td>6-10 years</td>
<td>11</td>
</tr>
<tr>
<td>11-20 years</td>
<td>46</td>
</tr>
<tr>
<td>21-30 years</td>
<td>38</td>
</tr>
<tr>
<td>31 plus</td>
<td>7</td>
</tr>
<tr>
<td>Highest Degree Held:</td>
<td></td>
</tr>
<tr>
<td>Bachelor's Degree</td>
<td>77</td>
</tr>
<tr>
<td>Master's Degree</td>
<td>35</td>
</tr>
<tr>
<td>Doctoral Degree</td>
<td>-</td>
</tr>
<tr>
<td>Have you ATTENDED any of the following:</td>
<td></td>
</tr>
<tr>
<td>An in-service on distance education through the STAR Schools Vocational Curriculum Institutes</td>
<td>8</td>
</tr>
<tr>
<td>A Star Schools in-service workshop on teleteaching methodology</td>
<td>5</td>
</tr>
<tr>
<td>An &quot;in-house&quot;, area education agency or other session on teleteaching/distance education</td>
<td>44</td>
</tr>
<tr>
<td>How HAVE you learned to use the teleteaching classroom?</td>
<td></td>
</tr>
<tr>
<td>In-service</td>
<td>32</td>
</tr>
<tr>
<td>Self-taught from printed material</td>
<td>19</td>
</tr>
<tr>
<td>Viewed a how-to-do-it video tape</td>
<td>5</td>
</tr>
<tr>
<td>From other teachers</td>
<td>33</td>
</tr>
<tr>
<td>From technicians</td>
<td>10</td>
</tr>
<tr>
<td>Preservice teacher education course</td>
<td>2</td>
</tr>
<tr>
<td>Graduate teacher education course</td>
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Table 1 (continued)

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<tr>
<td></td>
<td>n</td>
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<tr>
<td>How would you PREFER to learn and/or improve your skills in the teleteaching classroom?</td>
<td></td>
</tr>
<tr>
<td>In-service</td>
<td>99</td>
</tr>
<tr>
<td>Self-teaching from printed material</td>
<td>21</td>
</tr>
<tr>
<td>Viewing from a how-to-do-it video tape</td>
<td>42</td>
</tr>
<tr>
<td>From other teachers</td>
<td>96</td>
</tr>
<tr>
<td>From technicians</td>
<td>74</td>
</tr>
<tr>
<td>Preservice teacher education course</td>
<td>45</td>
</tr>
<tr>
<td>Graduate teacher education course</td>
<td>58</td>
</tr>
<tr>
<td>How would you PREFER to teach a teleteaching interactive class?</td>
<td></td>
</tr>
<tr>
<td>With one or two simultaneous remote sites</td>
<td>67</td>
</tr>
<tr>
<td>With three to five simultaneous remote sites</td>
<td>25</td>
</tr>
<tr>
<td>With six or more simultaneous remote sites</td>
<td>9</td>
</tr>
<tr>
<td>With &quot;turn teaching&quot; where each teacher involved takes responsibility for a segment of the class</td>
<td>70</td>
</tr>
<tr>
<td>With &quot;team teaching&quot; where each teacher is involved at all instructional sessions</td>
<td>76</td>
</tr>
</tbody>
</table>

* DO APPLY refers to number (1) choice
Table 2. Descriptive statistics (means and standard deviations) in each variable for knowledge, ability, interests, and feelings

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Mean</th>
<th>SD</th>
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<tbody>
<tr>
<td><strong>Knowledge</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Techniques for integrating academics and technology into family and consumer sciences</td>
<td>2.80</td>
<td>0.94</td>
</tr>
<tr>
<td>Distance education interactive teleteaching technology</td>
<td>2.26</td>
<td>0.89</td>
</tr>
<tr>
<td>Equipment used in interactive teleteaching</td>
<td>2.22</td>
<td>0.90</td>
</tr>
<tr>
<td>Applications of distance education teleteaching to family and consumer sciences</td>
<td>1.95</td>
<td>0.81</td>
</tr>
<tr>
<td>Creating teleteaching plans for distance education</td>
<td>1.58</td>
<td>0.73</td>
</tr>
<tr>
<td><strong>Ability</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speak clearly with adequate volume, and tone appropriate for teleteaching</td>
<td>3.32</td>
<td>1.10</td>
</tr>
<tr>
<td>Evaluate mini-lessons taught via distance education interactive teleteaching</td>
<td>2.66</td>
<td>1.08</td>
</tr>
<tr>
<td>Employ a variety of teaching strategies via interactive teleteaching</td>
<td>2.60</td>
<td>1.02</td>
</tr>
<tr>
<td>Use interactive teleteaching to supplement a traditional class with a guest speaker</td>
<td>2.52</td>
<td>1.17</td>
</tr>
<tr>
<td>Attend to classroom management responsibilities at separate teleteaching sites</td>
<td>2.46</td>
<td>1.14</td>
</tr>
<tr>
<td>Operate the equipment utilized in an interactive teleteaching classroom</td>
<td>2.21</td>
<td>1.08</td>
</tr>
<tr>
<td>Use interactive teleteaching to present an entire course</td>
<td>2.17</td>
<td>1.03</td>
</tr>
<tr>
<td>Handle the unexpected technical problems with ease</td>
<td>2.09</td>
<td>1.09</td>
</tr>
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Table 2 (continued)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Mean</th>
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</tr>
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<tbody>
<tr>
<td><strong>Interests</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Would you be interested in using a teleteaching lesson plan if it included a ....</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guest speaker from an outside agency?</td>
<td>4.01</td>
<td>0.83</td>
</tr>
<tr>
<td>Panel of employers prepared to address student questions?</td>
<td>3.99</td>
<td>0.82</td>
</tr>
<tr>
<td>Team teacher within the FCS discipline?</td>
<td>3.92</td>
<td>0.87</td>
</tr>
<tr>
<td>Job interview of students by professionals?</td>
<td>3.87</td>
<td>0.88</td>
</tr>
<tr>
<td>Team teacher outside the FCS discipline?</td>
<td>3.57</td>
<td>0.96</td>
</tr>
<tr>
<td><strong>Feelings</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interactive teleteaching is too complicated for me to do*</td>
<td>3.64</td>
<td>1.01</td>
</tr>
<tr>
<td>Interactive distance education is a valuable teaching method for Family and Consumer Sciences courses</td>
<td>3.63</td>
<td>0.79</td>
</tr>
<tr>
<td>Using interactive teleteaching for instruction makes teaching and learning too mechanical*</td>
<td>3.30</td>
<td>0.98</td>
</tr>
<tr>
<td>Interactive teleteaching does not allow social interaction in a class*</td>
<td>3.25</td>
<td>0.96</td>
</tr>
<tr>
<td>I prefer using interactive distance education with students who have previously experienced learning in this way</td>
<td>3.06</td>
<td>0.59</td>
</tr>
<tr>
<td>I am uncomfortable when I use interactive teleteaching equipment*</td>
<td>3.01</td>
<td>0.85</td>
</tr>
<tr>
<td>I feel uneasy teaching through interactive distance education*</td>
<td>2.96</td>
<td>0.83</td>
</tr>
<tr>
<td>Interactive teleteaching should be used in all FCS subject areas</td>
<td>2.85</td>
<td>1.01</td>
</tr>
<tr>
<td>I consider myself informed about the use of interactive teleteaching in the schools</td>
<td>2.14</td>
<td>1.18</td>
</tr>
</tbody>
</table>

* Negative stated items which were reversed
Table 3. Correlations among knowledge, ability, interests and feelings

<table>
<thead>
<tr>
<th></th>
<th>KNOW</th>
<th>ABIL</th>
<th>INTER</th>
<th>FEEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>KNOW</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ABIL</td>
<td>.51**</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INTER</td>
<td>.28**</td>
<td>.15</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>FEEL</td>
<td>.39**</td>
<td>.28**</td>
<td>.42**</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*ps.01.

KNOW=Knowledge
ABIL=Ability
INTER=Interests
FEEL=Feelings
Table 4. ANOVA: Effect of years as an educator on knowledge, ability, interests, and feelings

<table>
<thead>
<tr>
<th>Variable</th>
<th>Source</th>
<th>Mean square</th>
<th>F value</th>
<th>Sig. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>KNOWLEDGE</td>
<td>BETWEEN GR.</td>
<td>0.584</td>
<td>1.277</td>
<td>0.282</td>
</tr>
<tr>
<td></td>
<td>WITHIN GR.</td>
<td>0.457</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ABILITY</td>
<td>BETWEEN GR.</td>
<td>0.744</td>
<td>0.952</td>
<td>0.389</td>
</tr>
<tr>
<td></td>
<td>WITHIN GR.</td>
<td>0.781</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INTERESTS</td>
<td>BETWEEN GR.</td>
<td>0.258</td>
<td>0.514</td>
<td>0.599</td>
</tr>
<tr>
<td></td>
<td>WITHIN GR.</td>
<td>0.502</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FEELINGS</td>
<td>BETWEEN GR.</td>
<td>0.179</td>
<td>0.831</td>
<td>0.438</td>
</tr>
<tr>
<td></td>
<td>WITHIN GR.</td>
<td>0.215</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p ≤ 0.05.

*Groups are: 1-10, 11-20, and 21 or more
Table 5. T-test: Knowledge, ability, interests, and feelings by highest degree held

<table>
<thead>
<tr>
<th>Variable</th>
<th>Groups</th>
<th>Mean</th>
<th>SD</th>
<th>t-val.</th>
<th>2-tail prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>KNOWLEDGE</td>
<td>BACHEL.</td>
<td>2.11</td>
<td>0.62</td>
<td>.97</td>
<td>0.33</td>
</tr>
<tr>
<td></td>
<td>MASTER</td>
<td>2.24</td>
<td>0.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ABILITY</td>
<td>BACHEL.</td>
<td>2.50</td>
<td>0.83</td>
<td>.04</td>
<td>0.97</td>
</tr>
<tr>
<td></td>
<td>MASTER</td>
<td>2.51</td>
<td>0.99</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INTERESTS</td>
<td>BACHEL.</td>
<td>3.78</td>
<td>0.76</td>
<td>2.35*</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>MASTER</td>
<td>4.06</td>
<td>0.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FEELINGS</td>
<td>BACHEL.</td>
<td>3.05</td>
<td>0.44</td>
<td>1.46</td>
<td>0.15</td>
</tr>
<tr>
<td></td>
<td>MASTER</td>
<td>3.19</td>
<td>0.49</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<.05
CHAPTER 3. BELIEFS OF FAMILY AND CONSUMER SCIENCES SECONDARY SCHOOL TEACHERS TOWARD DISTANCE EDUCATION TECHNOLOGY FOR CURRICULUM DELIVERY

A paper to be submitted to the Journal of Vocational Education Research

Lemonia N. Bigilaki and Margaret Torrie

Abstract

The purpose of this study was to determine whether family and consumer sciences secondary school teachers believe that curriculum competencies could be taught via an interactive teleteaching classroom. Analyses were conducted to determine if there were differences among family and consumer sciences teachers' beliefs toward interactive teleteaching technology using curriculum competencies when compared to their years of experience and level of education. Results indicated that there were no significant differences among family and consumer sciences secondary school teachers' beliefs using curriculum competencies when compared to their years of experience (years as an educator). Furthermore, results indicated that there were no significant differences between family and consumer sciences secondary school teachers' beliefs using curriculum competencies when compared to their education (highest degree held).
Introduction

Interactive television as a tool for distance learning in Iowa

According to Hezel & Dirr (1991) one of the new educational technologies is interactive television, a distance education learning environment that allows live two-way audio and video communication between teacher and students at multiple sites. According to Piirto (1993) interactive television has enjoyed success because it meets students' needs for convenience and quality in education. Also it breaks down the barriers of time, distance, and visual contact. Bauer and Rezabek (1992) measured the effects of two-way visual contact on verbal interactivity as an expanded form for interactive television instruction. They found that students who receive two-way audio and video instruction were more likely to interact verbally than students who received audio instruction only.

Interactive television is a form of technology which has been introduced in the state of Iowa. The Iowa Communication Network (ICN) system operates its telephone and video transmissions by using fiber optic cable (Media Resource Center, 1994). The ICN is the nation's first and only two-way full motion interactive fiber optic network reaching every county in the state. Currently there are 157 sites connected to the network. A future development plan will add 482 sites. The ICN connects colleges, universities and secondary schools throughout the state. The future development plan will include
public and private school districts, area education agencies
and public libraries (Iowa Public Television, 1996).

The operational capability at each site includes video
cameras, a document camera, microphones, and the ICN switching
and control equipment (Media Resource Center, 1994). The
uniqueness of the ICN lies in the fact that when a student in
a remote site presses the button on the microphone to comment
or ask a question, the teacher is signaled and the camera in
the distant classroom automatically positions itself to the
area where the microphone is located.

The ICN was designed to be used by teachers and students
in learning situations where they can see and hear each other.
In this way, the system itself becomes not only a source of
information but also a technological medium providing students
with opportunities for sharing learning experiences (Simonson,
1994).

Teachers opinions about the ICN have been one of the
concerns for surveys conducted by the Iowa Distance Education
Alliance and research studies conducted by professionals.
There is only one study (Torrie and Miller, 1996) which
examined beliefs of Iowa secondary vocational teachers
relative to interactive teleteaching using core competencies
(leadership, job getting/job keeping, and entrepreneurship).
Specifically, part of the Torrie and Miller (1996) study asked
secondary vocational teachers to indicate their beliefs
whether core competencies could be taught via an interactive
teleteaching classroom. Three-hundred vocational secondary teachers were selected from a population of 2,420 vocational teachers in Iowa. A stratified sample of 12.4 percent was drawn from each of the discipline areas such as agriculture, business, family and consumer sciences/home economics, industrial and marketing. A total of 67 usable responses were returned. Teachers were asked to indicate their beliefs on a four-point scale with one indicating strongly believe and four indicating strongly disbelieve. Results of the study showed that respondents believed that core competencies such as leadership (overall mean 2.09), job getting/keeping (overall mean 2.10), entrepreneurship (overall mean 1.82) could be taught across an interactive teleteaching environment. The aforementioned research results are drawn only from the secondary vocational teachers in the state of Iowa.

**Family and consumer sciences programs and vocational education**

It is known that titles of vocational education vary from state to state. According to Iowa department of education, vocational education refers to a) agricultural education, b) business education, c) family and consumer sciences/home economics, d) distributive education, e) technical education, and f) trade and industrial education (Iowa Distance Education Alliance, 1993).

Vocational education is strongly influenced by federal and state legislation. Iowa legislation (Senate File 449)
effective July 1992 provides for equal access to a number of programs. The legislation specifies program characteristics, competencies, minimum requirements, evaluation and duties of regional and merged boards. Iowa requires vocational education programs for 7th and 8th grade students along with programs designed for high school and adults (Iowa Distance Education Alliance, 1993).

The Iowa Administrative Code (1993) chapter 15 subsection 256 specifies that each board of a local school district should develop policies relative to the use of telecommunications when the school district uses telecommunications for instructional programs. The local school district is responsible to report annually to the department of education. This report includes: a) to whom the instruction is delivered including class size, type of class and grade level; b) the course description and schedule of instruction; c) the number, assignment, licensing folder number and the training which enhances learning by telecommunications. Family and consumer sciences programs as part of the overall vocational education curriculum are influenced by the policy statements relative to the use of telecommunications for instructional purpose.

Family and Consumer Sciences programs formerly home economics with their emphasis on families have been part of the secondary school curriculum for over 75 years. They prepare students for the multiple roles of family member,
worker, citizen, and community member (Iowa Department of Education, 1993, p. HE-9). Family and Consumer Sciences is the only curriculum area that focuses entirely on practical living skills related to family life and occupations which enhance the work of the family (Iowa Department of Education, 1993, p. HE-9).

Two basic criteria are required for the development of family and consumer sciences programs in order to meet the Iowa vocational standards:

a) a district must offer and teach at least three sequential units within the family and consumer sciences/home economics service area
b) the program sequence must include one set of the minimum competencies from the family and consumer sciences/home economics education service area. It is expected the program will go beyond the minimum competencies (Iowa Department of Education, 1993, p. HE-11).

According to the Iowa Department of Education (1993) competencies function as the basis for building the instructional program. These are defined as "learned behaviors which can be accurately repeated and measured to a predetermined standard" (p. 5). Family and consumer sciences competencies refer to: a) housing and home management, b) food and nutrition, c) individual and family health, d) family living and parenthood, e) consumer education,
f) textiles and clothing, and g) child development (Iowa Department of Education, 1993).

These competencies were a major part of this study. Particularly, this study asked family and consumer sciences secondary school teachers to indicate their beliefs whether curriculum competencies could be taught via an interactive teleteaching classroom. Furthermore, the present study was designed in a similar way with part of the Torrie and Miller (1996) study with the difference that the population sample in this study was family and consumer sciences teachers only and a special emphasis was given to family and consumer sciences competencies. The need for the study lied in the fact that there were no studies found to examine family and consumer sciences secondary school teachers' beliefs toward an interactive teleteaching classroom when using curriculum competencies. Because family and consumer sciences programs are part of the vocational education curriculum, results of the present study were cross-examined with the Torrie and Miller (1996) study providing more indepth examination.

Purpose

The purpose of this study was to determine whether family and consumer sciences secondary school teachers believe that curriculum competencies could be taught via an interactive teleteaching classroom. Two major research questions were:

1. Does years of experience of family and consumer
sciences secondary school teachers have an effect on their beliefs?

2. Does educational level of family and consumer sciences secondary school teachers have an effect on their beliefs?

Materials and Methods

Data Collection Instruments

This study was descriptive in nature and involved the use of a mailed questionnaire. The questionnaire was developed by the researcher after an extensive review of literature and careful consideration of studies over the Iowa Communications Network. The questionnaire was reviewed by a panel of experts and pilot-tested by students (undergraduate and graduate) in the Department of Family and Consumer Sciences at Iowa State University. The panel of experts examined the questionnaire's both construct-related and content-related evidence of validity.

The questionnaire contained three parts. Only one part of the questionnaire is the basis for this journal article. This part of the questionnaire asked teachers to indicate their beliefs whether family and consumer sciences competencies can be taught via an interactive teleteaching classroom. The questionnaire was designed to assess beliefs based on teachers' responses. Therefore, beliefs were recognized as self-reported ones.
Instead of answering directly on the questionnaire, teachers were provided an answer sheet which was machine scored. They responded by darkening a number between one and five on the machine scored answer sheet for each of the statements on the questionnaire. Specifically, for teachers beliefs relative to interactive teleteaching when using curriculum competencies, strongly disbelieve was coded a number one, don't believe a two, undecided a three, believe a four and strongly believe a five.

Identification of the Population and Sample

Two hundred fifty from a total of 445 family and consumer sciences secondary school teachers were selected by a computerized random technique from the 1994-95 Iowa Educational Directory List Data Base (Iowa Department of Education, 1995). Data collection began in December, but was halted during December and January as the holidays and semester changes are a busy time in schools. Data collection resumed in February and lasted until March. During February and the beginning of March the researcher followed up with a phone call. Two hundred fifty teachers were included in the first phase of the follow up phone call. At the end of the first phase of the follow up phone call 40 teachers were sent an additional packet of materials. During the second phase of the follow up phone calls (40 teachers), numerous comments were made regarding their general lack of experience and
unfamiliarity with the Iowa Communications Network system.
These attitudes contributed to the response rate. Finally, 112
teachers (45% of the population) became the data producing
sample of this study.

Data Analysis

The completed answer sheets were coded in a manner
suitable for statistical analysis. A special code was used to
identify each item of the questionnaire in the statistical
analysis. All answer sheets were optically scanned and
responses on the answer sheets were transferred to a computer
data file. Statistical analysis was performed using version
4.1 of the Statistical Package for Social Sciences.

Descriptive statistics, means and standard deviations
were calculated for all items. Reliabilities also were
provided for each of the family and consumer sciences
competency subunits. One-way analysis of variance (ANOVA) was
calculated for family and consumer sciences secondary school
teachers' beliefs relative to interactive teleteaching when
compared to their years of experience (years as an educator).
In addition, a t-test was calculated for family and consumer
sciences secondary school teachers' beliefs when compared to
their education (highest degree held). For the aforementioned
statistical analysis such as one-way analysis of variance
(ANOVA) and t-test the level of significance was 0.05.
Results and Discussion

Profile of participants

A total of 112 usable responses were returned to the researcher, a response rate of 45%. The majority of respondents (41%) reported that they had taught 11 to 20 years. Twenty-one of the respondents (19%) had 10 or fewer years of teaching experience. Thirty-eight of the respondents (34%) reported 21 to 30 years. Finally, only seven of the respondents (6%) had 31 or more years of experience (see Table 1).

Place Table 1 About Here

Interactive teleteaching and family and consumer sciences competencies

Family and consumer sciences competencies are found in the Iowa Department of Education vocational education program management guide. Teachers were asked to indicate their beliefs from strongly disagree (1) to strongly agree (5) as to whether family and consumer sciences competencies could be taught via an interactive teleteaching classroom with one or two remote sites.

Family and consumer sciences competencies were grouped into seven subunits: a) housing and home management
(11 items), b) food and nutrition (10 items),
c) individual/family health (8 items), d) family living and parenthood (18 items), e) consumer education (5 items),
f) textiles and clothing (11 items), and g) child development (13 items). The core competencies (leadership, job getting/job keeping, entrepreneurship) were a separate subunit (3 items). Item means and standard deviations for each competency are indicated in Table 2. The means ranged from 2.16 to 4.20 for all the listed competencies. An overall mean score was computed for each of the seven subunits: housing and home management (3.78), food and nutrition (3.21), individual/family health (3.96), family living and parenthood (3.82), consumer education (3.99), textiles and clothing (3.39), child development (3.88), core competency subunit (3.55). Most of the item means and the overall mean scores indicated that teachers were undecided whether family and consumer sciences could be taught via an interactive teleteaching classroom with no more than two remote sites (see Table 2).

Place Table 2 About Here

A reliability test was run for the family and consumer sciences teachers' beliefs to determine their internal
consistency. The overall reliability test produced a coefficient alpha of 0.98. The reliability test for housing and home management produced a coefficient alpha of 0.88. For food and nutrition the coefficient alpha was 0.84. For individual/family health the coefficient was 0.92. The family living and parenthood subunit had a coefficient of 0.95. For consumer education the coefficient alpha was 0.85. For textiles and clothing the coefficient alpha was 0.88. The child development subunit had a coefficient of 0.95. Finally, the core competency subunit had a coefficient alpha of 0.89.

One-way analysis of variance (ANOVA) was run to test the first major research question. Due to the small number of respondents in four categories (1 to 5, 6 to 10, 21 to 30 and 31 or more years) of the five, three main categories were reproduced for the statistical purposes: 1 to 10 years, 11 to 20, and 21 or more. One-way analysis of variance (ANOVA) revealed that there were no significant differences among family and consumer sciences secondary school teachers' beliefs when compared to their years of experience (see Table 3).

Place Table 3 About Here
To examine the second major research question a t-test was run. Not one of the respondents (N=112) held a doctoral degree. Therefore only two groups were examined; those who held only a bachelor's degree and those who held a master's degree. Results indicated that there were no significant differences between family and consumer sciences secondary school teachers' beliefs relative to interactive teleteaching using curriculum competencies when compared to their education (highest degree held). The level of significance selected for both analysis of variance and t-test was 0.05. Because there were no significant differences a pooled variance estimate was recorded (see table 4).

Summary and Conclusions

The purpose of this study was to determine whether family and consumer sciences secondary school teachers believe that curriculum competencies could be taught via interactive teleteaching. The study was descriptive in nature and involved the use of 250 mailed questionnaires. A total of 112 usable responses were returned. From the analysis of the data, the following conclusions are offered:

1. Participants were undecided whether family and consumer
sciences competencies could be taught via an interactive teleteaching classroom.

2. Participants' years of experience did not have an effect on their beliefs whether curriculum competencies can be taught via an interactive teleteaching classroom.

3. Participants' educational level did not have an effect on their beliefs whether curriculum competencies can be taught via an interactive teleteaching classroom.

In a cross examination of research studies, results of this study contradict with findings of the Torrie and Miller (1996) study in that vocational teachers believed that core competencies could be taught via an interactive teleteaching classroom with no more than two remote sites. Finally, results of this study can be used by family and consumer sciences teacher educators and curriculum specialists who are challenged to develop new curriculum programs appropriate for interactive teleteaching.

References


Media Resources Center (1994). *ICN scheduling procedures: Scheduling the Iowa Communications Network at Iowa State University*. Ames, IA: Media Resources Center, Iowa State University.


Table 1. Frequencies and percentages of teachers' years of experience and education

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>DO APPLY*</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Years as an educator:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-5 years</td>
<td></td>
<td>10</td>
<td>8.9</td>
</tr>
<tr>
<td>6-10 years</td>
<td></td>
<td>11</td>
<td>9.8</td>
</tr>
<tr>
<td>11-20 years</td>
<td></td>
<td>46</td>
<td>41.1</td>
</tr>
<tr>
<td>21-30 years</td>
<td></td>
<td>38</td>
<td>33.9</td>
</tr>
<tr>
<td>31 plus</td>
<td></td>
<td>7</td>
<td>6.3</td>
</tr>
<tr>
<td><strong>Highest Degree Held:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor's Degree</td>
<td></td>
<td>77</td>
<td>68.8</td>
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<td>Master's Degree</td>
<td></td>
<td>35</td>
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<tr>
<td>Doctoral Degree</td>
<td></td>
<td>-</td>
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</table>

* DO APPLY refers to number (1) choice
Table 2. Descriptive statistics (means and standard deviations) in each variable for FCS competencies and Core competencies

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Mean</th>
<th>SD</th>
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</thead>
<tbody>
<tr>
<td><strong>HOUSING AND HOME MANAGEMENT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identify recent trends in housing</td>
<td>4.13</td>
<td>0.60</td>
</tr>
<tr>
<td>Explain basic financial and legal aspects of housing in various demographic situations</td>
<td>4.03</td>
<td>0.76</td>
</tr>
<tr>
<td>Examine home furnishings-home management related occupations</td>
<td>4.03</td>
<td>0.76</td>
</tr>
<tr>
<td>Identify procedures in planning for expenses, saving and managing finances</td>
<td>3.92</td>
<td>0.85</td>
</tr>
<tr>
<td>Evaluate housing alternatives</td>
<td>3.90</td>
<td>0.75</td>
</tr>
<tr>
<td>Examine design principles and elements</td>
<td>3.83</td>
<td>0.81</td>
</tr>
<tr>
<td>Locate and/or utilize home furnishings and equipment resources</td>
<td>3.79</td>
<td>0.76</td>
</tr>
<tr>
<td>Identify qualities of home furnishings and appliances</td>
<td>3.76</td>
<td>0.87</td>
</tr>
<tr>
<td>Demonstrate safety, sanitation, security, and first aid procedures</td>
<td>3.63</td>
<td>0.94</td>
</tr>
<tr>
<td>Apply the principles of management in the home</td>
<td>3.45</td>
<td>0.91</td>
</tr>
<tr>
<td>Use equipment and supplies with proper procedures</td>
<td>3.16</td>
<td>1.05</td>
</tr>
<tr>
<td><strong>FOOD AND NUTRITION</strong></td>
<td>3.21</td>
<td></td>
</tr>
<tr>
<td>Examine food related occupations</td>
<td>4.23</td>
<td>0.67</td>
</tr>
<tr>
<td>Locate and/or utilize food and nutrition resources</td>
<td>3.96</td>
<td>0.73</td>
</tr>
<tr>
<td>Identify various cultural and regional cuisines</td>
<td>3.90</td>
<td>0.84</td>
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### Table 2 (continued)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Subunit overall mean</th>
<th>Mean</th>
<th>SD</th>
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<tbody>
<tr>
<td><strong>FOOD AND NUTRITION</strong></td>
<td>3.21</td>
<td>3.89</td>
<td>0.83</td>
</tr>
<tr>
<td>Analyze fad diets and eating disorders</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analyze nutritional needs and select foods for good health throughout life</td>
<td>3.66</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Plan menus, prepare shopping list and purchase food</td>
<td>2.94</td>
<td>1.19</td>
<td></td>
</tr>
<tr>
<td>Apply the principles of sanitation, recycling and safety when working with food and equipment</td>
<td>2.68</td>
<td>1.32</td>
<td></td>
</tr>
<tr>
<td>Utilize basic kitchen skills in food preparation and storage</td>
<td>2.40</td>
<td>1.16</td>
<td></td>
</tr>
<tr>
<td>Prepare foods from the basic food groups</td>
<td>2.30</td>
<td>1.07</td>
<td></td>
</tr>
<tr>
<td>Plan, prepare, serve and evaluate a meal</td>
<td>2.16</td>
<td>1.09</td>
<td></td>
</tr>
<tr>
<td><strong>INDIVIDUAL/FAMILY HEALTH</strong></td>
<td>3.96</td>
<td>4.20</td>
<td>0.67</td>
</tr>
<tr>
<td>Examine family/individual health related occupations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identify the needs and concerns of populations with special needs</td>
<td>4.00</td>
<td>0.73</td>
<td></td>
</tr>
<tr>
<td>Locate and/or utilize family/individual health resources</td>
<td>3.99</td>
<td>0.84</td>
<td></td>
</tr>
<tr>
<td>Evaluate consumer health options</td>
<td>3.98</td>
<td>0.77</td>
<td></td>
</tr>
<tr>
<td>Explain the basic skills necessary to maintain personal, physical, and mental health</td>
<td>3.95</td>
<td>0.76</td>
<td></td>
</tr>
<tr>
<td>Describe procedures for prevention and control of diseases</td>
<td>3.92</td>
<td>0.79</td>
<td></td>
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### Table 2 (continued)

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<thead>
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<th>Subunit overall mean</th>
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<th>SD</th>
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<tbody>
<tr>
<td><strong>INDIVIDUAL/FAMILY HEALTH</strong></td>
<td>3.96</td>
<td>3.86</td>
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<tr>
<td>Identify substance abuse, use and non-use</td>
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<td>Identify personal safety and survival skills</td>
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<td>0.86</td>
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<td>3.82</td>
<td>4.09</td>
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<tr>
<td>Examine family living/parenthood occupations</td>
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<tr>
<td>Examine various child care options</td>
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<td>4.01</td>
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<tr>
<td>Identify sex-role stereotyping and means of dealing with them</td>
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<td>4.01</td>
<td>0.68</td>
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<td>Identify types of sexual abuse and sexual harassment, and intervention options</td>
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<td>0.74</td>
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<tr>
<td>Identify risks of sexual activity</td>
<td></td>
<td>3.98</td>
<td>0.75</td>
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<tr>
<td>Identify various family patterns and lifestyles</td>
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<td>0.76</td>
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<tr>
<td>Identify the ways to balance work, family and individual needs</td>
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<td>3.92</td>
<td>0.75</td>
</tr>
<tr>
<td>Locate/utilize family living and parenthood resources</td>
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<td>3.89</td>
<td>0.86</td>
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<tr>
<td>Describe the physical, social, emotional, intellectual development that occurs during childhood through adulthood including individuals with special needs</td>
<td>3.89</td>
<td>0.79</td>
<td></td>
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<tr>
<td>Describe ways to strengthen family relationships</td>
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<td>3.82</td>
<td>0.79</td>
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<tr>
<td>Identify ways to deal with peer pressure</td>
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<td></td>
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<tr>
<td><strong>FAMILY LIVING AND PARENTHOOD</strong></td>
<td>3.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Describe ways to build good interpersonal relationships with others</td>
<td>3.79</td>
<td>0.80</td>
<td></td>
</tr>
<tr>
<td>Locate/utilize resources for populations with special needs</td>
<td>3.75</td>
<td>0.82</td>
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<tr>
<td>Analyze strategies for developing a positive self concept</td>
<td>3.72</td>
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<tr>
<td>Develop short and long-term planning, goal-setting and decision making skills</td>
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<td>Develop problem-solving techniques</td>
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<td>0.97</td>
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<td>Demonstrate alternative ways of effective communications</td>
<td>3.52</td>
<td>1.09</td>
<td></td>
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<td>Identify and demonstrate response to family problems and crisis</td>
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<td></td>
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<tr>
<td>Identify consumer rights and responsibilities</td>
<td>4.13</td>
<td>0.65</td>
<td></td>
</tr>
<tr>
<td>Examine consumer education related occupations</td>
<td>4.12</td>
<td>0.78</td>
<td></td>
</tr>
<tr>
<td>Locate and/or utilize consumer education resources for assistance</td>
<td>3.94</td>
<td>0.87</td>
<td></td>
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<tr>
<td>Determine the decision-making process in planning for expenses, savings and managing finances</td>
<td>3.90</td>
<td>0.80</td>
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<tr>
<td>Evaluate advertising, warranties, written contracts and quality of goods and equipment</td>
<td>3.84</td>
<td>0.97</td>
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Table 2 (continued)

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<td><strong>TEXTILES AND CLOTHING</strong></td>
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<tr>
<td>Examine textiles and clothing related occupations</td>
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<td>Locate and/or utilize textiles and clothing resources for assistance</td>
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<td>0.93</td>
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<tr>
<td>Describe cleaning and storage methods</td>
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<tr>
<td>Recognize the relationship between appearance and self concept</td>
<td>3.71</td>
<td>0.94</td>
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<td>Identify elements and principles of clothing design</td>
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<td>Evaluate clothing and accessory purchases</td>
<td>3.60</td>
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<td>Plan a wardrobe and prepare a clothing budget</td>
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<tr>
<td>Demonstrate repair, alteration and recycling methods</td>
<td>2.96</td>
<td>1.15</td>
</tr>
<tr>
<td>Identify fabrics, fabric construction, finishes and care</td>
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<tr>
<td>Demonstrate use and care of sewing machine and equipment in a safe manner</td>
<td>2.76</td>
<td>1.17</td>
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<tr>
<td>Follow preparation procedures for constructing and evaluating a garment project</td>
<td>2.69</td>
<td>1.15</td>
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<td><strong>CHILD DEVELOPMENT</strong></td>
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<td>Examine child development related occupations</td>
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<td>Discuss childhood diseases and immunization procedures</td>
<td>4.03</td>
<td>0.76</td>
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Table 2 (continued)

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<th>Mean</th>
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<tr>
<td><strong>CHILD DEVELOPMENT</strong></td>
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<td>Identify the additional risks of teen pregnancy and parenting</td>
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<td>Identify types of child abuse, neglect and intervention options</td>
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<td>3.97</td>
<td>0.78</td>
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<td>Discuss health concerns and needs at various stages of prenatal and postnatal development</td>
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<td>0.80</td>
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<td>Locate and/or utilize child development resources for assistance</td>
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<td>3.93</td>
<td>0.94</td>
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<tr>
<td>Describe sexual reproduction and birthing process</td>
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<td>Identify ways to provide a safe environment for a child</td>
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<td>0.85</td>
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<tr>
<td>Describe ways to guide the physical, social, emotional, and intellectual development of children including those with special needs</td>
<td></td>
<td>3.87</td>
<td>0.91</td>
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<tr>
<td>Examine parenting responsibilities</td>
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<td>3.87</td>
<td>0.90</td>
</tr>
<tr>
<td>Analyze contraception and family planning methods</td>
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<td>3.79</td>
<td>0.90</td>
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<tr>
<td>Select toys, equipment, food and materials appropriate for the development stage of a child</td>
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<td>3.55</td>
<td>1.04</td>
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<tr>
<td>Select and use appropriate child guidance techniques</td>
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<td>3.53</td>
<td>1.06</td>
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<tr>
<td><strong>CORE COMPETENCIES</strong></td>
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<tr>
<td>Entrepreneurship competencies</td>
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<td>Job getting, job keeping competencies</td>
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<td>Leadership competencies</td>
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<td>3.32</td>
<td>1.10</td>
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Table 3. ANOVA: Effect of years as an educator* on beliefs

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<th>Source</th>
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<th>F value</th>
<th>Sig. of F</th>
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<td>BELIEFS</td>
<td>BETWEEN GR.</td>
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<td>1.139</td>
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<tr>
<td></td>
<td>WITHIN GR.</td>
<td>0.308</td>
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</table>

*p<.05.

*Groups are: 1-10, 11-20, and 21 or more

Table 4. T-test: Beliefs by highest degree held

<table>
<thead>
<tr>
<th>Variable</th>
<th>Groups</th>
<th>Mean</th>
<th>SD</th>
<th>t-val.</th>
<th>2-tail prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BELIEFS</td>
<td>BACHEL.</td>
<td>3.65</td>
<td>0.55</td>
<td>1.58</td>
<td>0.12</td>
</tr>
<tr>
<td></td>
<td>MASTER</td>
<td>3.83</td>
<td>0.56</td>
<td></td>
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</tbody>
</table>

*Groups are: 1-10, 11-20, and 21 or more
CHAPTER 4. GENERAL CONCLUSIONS

According to Perraton (1993) distance education has grown in numbers of students, institutions and in academic respectability in the last 30 years (p. 3). During this time distance education programs have used a variety of methods to overcome the separation between the learners and the teacher. Radio and telephone conferences have played an important role in distance education programs. More recently interactive television is the technological medium that breaks down the barriers of time, face to face contact, and distance.

In Iowa, distance education is implemented by the Iowa Communications Network system (ICN). The Iowa Communications Network is the telecommunications system that is installed by the state of Iowa. The ICN is the nation's first and only two-way full motion interactive fiber optic network reaching every county in the state (Iowa Public Television, 1996).

In the first two phases of the development of the fiber optic network project 104 sites were included. Currently there are 157 sites connected to the network. The network hub is located in the new Iowa National Guard Armory in Johnston. A future development plan will add 482 sites including public and private school districts, area education agencies and public libraries throughout the state (Iowa Public Television, 1996).

Report surveys and research studies have been conducted in order to examine teachers' opinions about the ICN.
Anderson (1996) stated that successful operation of a distance learning classroom requires the knowledge, ability, skills, and cooperation of a number of individuals. Especially, the teacher who is responsible for class content, design and delivery of instruction, degree of interactivity, and students evaluation at all remote sites and origination site (p. 166). Collis, Veen, and De Vries (1993) stated that necessary knowledge and skills are required for distance education teachers in order to be effective. According to Stewart (1996) the next decade will be a period of rapid change regarding the use of technology in family and consumer sciences. Improved hardware and software will enhance the integration of technology such as laser disks, interactive video, and distance learning facilities. Findings of her research review indicated a continuing necessity for in-service education for family and consumer sciences teachers regarding integration of technology (p. 258). This study was focused on Iowa family and consumer sciences secondary school teachers. The purpose of the study was to identify family and consumer sciences secondary school teachers' self-reported knowledge, ability, interests, feelings, beliefs, and teaching preferences toward interactive teleteaching when using curriculum competencies. The term orientations embraced all the measuring constructs such as self-reported knowledge, ability, interests, feelings, beliefs, and teaching preferences.

A random selection approach was used in order to reach
a large number of respondents in diverse geographical areas within the state of Iowa. Two hundred fifty from a total of 445 family and consumer sciences secondary school teachers were selected by a computerized random selection technique from the 1994-95 Iowa Educational Directory List. One hundred and twelve teachers (45% of the population) became the data producing sample for this study. These teachers were mailed a packet of materials including the questionnaire, the general purpose answer sheet, and a self-addressed stamped envelope for returning the answer sheet.

The questionnaire contained three parts. Part I assessed the level of knowledge relative to interactive teleteaching, ability to use interactive teleteaching technology, interests in using prepared lesson plans with the help of other professionals, and feelings toward the use of interactive teleteaching technology and family and consumer sciences courses. Part II explored respondents' beliefs toward the use of interactive teleteaching technology when using curriculum competencies. Part III requested information about the respondents' professional development, current professional responsibilities, and preferences (learning and teaching).

This study was presented in the alternate format including two manuscripts. The purpose of the first manuscript was to identify the family and consumer sciences secondary school teachers' self-reported knowledge, ability, interests, feelings, and teaching preferences toward interactive
teleteaching technology. One-way analyses of variance (ANOVA) were run to examine whether there were significant differences among family and consumer sciences teachers' self-reported knowledge, ability, interests, and feelings toward interactive teleteaching when compared to their years of experience (years as an educator). Due to the small number of respondents in four (1 to 5, 6 to 10, 21-30, and 31 or more) of the five categories of the years of experience, three groups were reproduced: a) 1 to 10, 11 to 20, and 21 or more. Results indicated that there were no significant differences among family and consumer sciences teachers' self-reported knowledge, ability, interests, and feelings toward interactive teleteaching when compared to their years of experience.

Additionally, t-tests were run to examine whether there were significant differences between family and consumer sciences teachers' self-reported knowledge, ability, interests, and feelings toward interactive teleteaching when compared to their education (highest degree held). Because not one held a doctoral degree, two groups were formed; those who held only a bachelor's degree and those who held a master's degree. Results indicated that there were no significant differences between family and consumer sciences teachers self-reported knowledge, ability, and feelings toward interactive teleteaching when compared to their education (highest degree held). However, there were significant differences in teachers' self-reported interests toward
interactive teleteaching when teachers were grouped by their educational level. Particularly, those who held a master's degree indicated a higher level of interest in using prepared lesson plans with the help of other professionals than those who held only a bachelor's degree.

For their teaching preferences, the majority (60%) reported that they preferred to teach with one or two simultaneous remote sites followed by those (22%) who preferred to teach with three to five. Very few teachers (8%) preferred to teach with six or more remote sites. In addition, team teaching (68%) was more preferable than turn teaching (63%) among teachers. Team teaching is the situation where each teacher is involved at all instructional sessions and turn teaching is the situation where each teacher involved takes responsibility for a segment of the class.

The purpose of the second manuscript was to determine whether family and consumer sciences secondary school teachers believe that curriculum competencies can be taught via an interactive teleteaching classroom. One-way analysis of variance (ANOVA) was run to test whether there were significant differences among family and consumer sciences teachers' self-reported beliefs relative to interactive teleteaching using curriculum competencies when compared to their years of experience (years as an educator). Due to the small number of respondents in the four categories (1 to 5, 6 to 10, 21 to 30 and 31 or more years) of the five, three main
categories were reproduced for the statistical purposes: 1 to 10 years, 11 to 20, and 21 or more. Results revealed that there were no significant differences among family and consumer sciences teachers' self-reported beliefs relative to interactive teleteaching using curriculum competencies when compared to their years of experience.

A t-test was run to test whether there were differences between family and consumer sciences secondary school teachers' self-reported beliefs relative to interactive teleteaching using curriculum competencies when compared to their education (highest degree held). None of the sample (N=112) held a doctoral degree. Therefore only two groups were examined; those who held only a bachelor's degree and those who held a master's degree. Results indicated that there were no significant differences between family and consumer sciences secondary school teachers' self-reported beliefs relative to interactive teleteaching using curriculum competencies when compared to their education (highest degree held). Based on the data analysis the following conclusions are offered:

1. At the time of the study approximately 50% of the participants had not attended any formal presentation on interactive teleteaching.
2. Thirty-three of the participants (30%) had learned to use teleteaching from other teachers followed by those (29%) who learned through in-service.
3. The majority of the participants (88%) preferred to learn about and improve their skills in the teleteaching classroom through in-service followed by those (86%) who preferred to learn from other teachers.

4. Sixty-seven of the participants (60%) preferred to teach with one or two sites followed by those who preferred (22%) three to five. More than two-thirds of the participants (68%) preferred team-teaching.

5. Participants' self-reported knowledge relative to interactive teleteaching technology was very little.

6. Participants' self-reported ability to perform their teaching role in an interactive teleteaching environment was inadequate.

7. Participants' self-reported interest in using prepared teleteaching materials and collaborating with professionals within and outside their discipline was unknown.

8. Participants' self-reported feelings about family and consumer sciences courses and interactive teleteaching instructional techniques indicated a neutral reaction.

9. Participants' years of experience (years as an educator) does not have an effect on their knowledge, ability, interests, and feelings.

10. Participants' education (highest degree held) does not have an effect on their knowledge, ability, and feelings. It does have an effect on their interests. Teachers who held a master's degree indicated a higher level of interest than
those who held only a bachelor's degree.

11. Participants were undecided whether family and consumer sciences competencies could be taught via an interactive teleteaching classroom.

12. Participants' years of experience does not have an effect on their beliefs whether curriculum competencies can be taught via an interactive teleteaching classroom.

13. Participants' education does not have an effect on their beliefs whether curriculum competencies can be taught via an interactive teleteaching classroom.

From the results of this study, it is apparent that efforts may need to be taken to better inform family and consumer sciences secondary school teachers about the Iowa Communications Network System. Because teachers prefer to learn about the system through in service and from other teachers, additional training and collaboration among them may be viewed as an effective process. Also, results of this study can be used by family and consumer sciences teacher educators and curriculum specialists. They are challenged to facilitate the development of curriculum programs appropriate for interactive teleteaching.

Recommendations for Future Research

Recommendations are suggested based on the results of this study to identify family and consumer sciences secondary school teachers' knowledge, ability, interests, feelings,
beliefs and teaching preferences toward interactive teleteaching when using curriculum competencies.

1. In-service teachers and administrators should work together to implement distance education teleteaching programs in their schools. Results of this study indicated that there is an interest among teachers to work as team members with other family and consumer sciences teachers. There is a hope that collaboration among family and consumer sciences teachers using distance education teleteaching will grow.

2. Expand in-service family and consumer sciences teacher education curriculum to include methods and programs related to the Iowa Communications Network delivery system. Based on the results of this study teachers with only a bachelor's degree indicated lower interest in using prepared lesson plans with the help of other professionals than those who held a master's degree.

3. New curriculum programs can be developed enhancing interactive teleteaching by using family and consumer sciences content. Results indicated that family and consumer sciences secondary school teachers were undecided whether curriculum competencies could be taught via an interactive teleteaching classroom.
References


February 12, 1996

Dear Educator,

We are conducting a study to assess the knowledge, attitudes and teaching practices of FCS secondary educators towards the use of interactive distance education technology to support the competency based curriculum reform efforts mandated by the federal and Iowa Departments of Education. Distance Education is the delivery of educational programs between teleteaching classrooms where the teacher and some of the students are in different locations. The transmission of video and audio signals occurs in real time so that interaction is facilitated among participants at various sites. Technology used to make distance education interactive involves computers, cameras, microphones and speakers, facsimile machines, visual projectors, interactive television, CD ROM, video tapes and laser disc players.

The information you provide will be beneficial to teacher educators and FCS curriculum specialists as they plan and develop future resources in the area of interactive distance education technology. Your help, therefore, is essential for obtaining an accurate description of current pedagogy. Your participation in this study is completely voluntary. Your responses will remain confidential. No risks or discomforts are associated with your participation in this study. The questionnaire will take approximately 20 minutes to complete. Please respond on the General Purpose Answer Sheet using a number 2 pencil. You do not need to complete any of the sections requesting demographic information to the left of the darkened bar on side one of the answer sheet. Within the next two weeks, please return your answer sheet and any additional comments you may have, in the enclosed envelope.

If you have any questions about the study, or the attached questionnaire, please ask. Thanks for your participation in the survey.

Sincerely,

Margaret Torrie
Associate Professor
FCEDS & C&I
515/294-1733
mtorrie@iastate.edu

Nitsa Bigilaki
Research Associate
FCEDS
515/294-1172
nitsa@iastate.edu
USE OF INTERACTIVE DISTANCE EDUCATION
TELETEACHING TECHNOLOGY FOR FAMILY AND CONSUMER SCIENCES
COMPETENCIES
Nitsa Bigilaki and Margaret Torrie
219 Mackay Hall
Iowa State University
Ames, Iowa 50011-1120

PART I: DIRECTIONS:

Use the following scale to indicate your level of knowledge about items 1 through 5.
1=none 2=very little 3=some 4=quite a bit 5=extensive

1. Distance education interactive teleteaching technology.
2. Techniques for integrating academics and technology into family and consumer sciences
3. Equipment used in interactive teleteaching.
4. Applications of distance education teleteaching to family and consumer sciences.
5. Creating teleteaching plans for distance education.

For questions 6 through 13, use the scale below to rate your ability to do the following.
1=very inadequate 2=inadequate 3=unknown 4=adequate 5=very adequate

7. Operate the equipment utilized in an interactive teleteaching classroom.
8. Speak clearly with adequate volume, and tone appropriate for teleteaching.
9. Handle the unexpected technical problems with ease.
10. Employ a variety of teaching strategies via interactive teleteaching.
11. Attend to classroom management responsibilities at separate teleteaching sites.
12. Use interactive teleteaching to supplement a traditional class with a guest speaker.
13. Use interactive teleteaching to present an entire course

Answer questions 14 through 18 using the following scale,

1=absolutely not  2=probably not  3=not sure  4=probably yes  5=absolutely yes

Would you be interested in using a teleteaching lesson plan if it included a...

14. Team teacher outside the FCS discipline?
15. Team teacher within the FCS discipline?
16. Guest speaker from an outside agency?
17. Job interview of students by professionals?
18. Panel of employers prepared to address student questions?

Please respond to each statement for questions 19-27 in terms of your feelings about Family and Consumer Sciences courses and interactive teleteaching instructional techniques in your school. Use the following scale.

1=strongly disagree  2=somewhat disagree  3=neither agree or disagree  4=somewhat agree  5=strongly agree

19. Interactive teleteaching is too complicated for me to do.
20. Interactive teleteaching should be used in all FCS subject areas.
21. I am uncomfortable when I use interactive teleteaching equipment.
22. I feel uneasy teaching through interactive distance education.
23. I prefer using interactive distance education with students who have previously experienced learning in this way.
25. I consider myself informed about the use of interactive teleteaching in the schools.
26. Interactive teleteaching does not allow social
interaction in a class.

27. Interactive distance education is a valuable teaching method for Family and Consumer Sciences courses.

PART II: DIRECTIONS
Consider the Family and Consumer Sciences competencies as referred to in items 28-106 and indicate to what extent you believe they can be taught via the teleteaching network in an interactive distance learning classroom, with one or two remote sites. Use the following scale.

1=strongly disagree 2=don't believe 3=undecided 4=believe 5=strongly believe

HOUSING AND HOME MANAGEMENT
28. Identify recent trends in housing
29. Explain basic financial and legal aspects of housing in various demographic situations
30. Evaluate housing alternatives
31. Examine design principles and elements
32. Identify qualities of home furnishings and appliances
33. Examine home furnishings-home management related occupations
34. Locate and/or utilize home furnishings and equipment resources
35. Demonstrate safety, sanitation, security, and first aid procedures
36. Identify procedures in planning for expenses, saving and managing finances
37. Use equipment and supplies with proper procedures
38. Apply the principles of management in the home

FOOD AND NUTRITION
39. Examine food related occupations
40. Analyze nutritional needs and select foods for good health throughout life
41. Prepare foods from the basic food groups
42. Plan menus, prepare shopping list and purchase food
43. Plan, prepare, serve and evaluate a meal
44. Utilize basic kitchen skills in food preparation and storage
45. Apply the principles of sanitation, recycling and safety when working with food and equipment
46. Analyze fad diets and eating disorders
47. Identify various cultural and regional cuisines
48. Locate and/or utilize food and nutrition resources

INDIVIDUAL/FAMILY HEALTH
49. Evaluate consumer health options
50. Explain the basic skills necessary to maintain personal, physical, and mental health
51. Identify personal safety and survival skills
52. Identify substance abuse, use and non-use
53. Describe procedures for prevention and control of diseases
54. Identify the needs and concerns of populations with special needs
55. Examine family/individual health related occupations
56. Locate and/or utilize family/individual health resources

FAMILY LIVING AND PARENTHOOD
57. Analyze strategies for developing a positive self concept
58. Demonstrate alternative ways of effective communications
59. Describe ways to build good interpersonal relationships with others
60. Identify risks of sexual activity
61. Identify the ways to balance work, family and individual needs
62. Identify sex-role stereotyping and means of dealing with them
63. Identify types of sexual abuse and sexual harassment, and intervention options
64. Identify and demonstrate response to family problems and crisis
65. Identify various family patterns and lifestyles
66. Develop short and long-term planning, goal-setting and decision making skills
67. Locate/utilize resources for populations with special needs
68. Develop problem-solving techniques
69. Identify ways to deal with peer pressure
70. Describe ways to strengthen family relationships
71. Describe the physical, social, emotional, intellectual development that occurs during childhood through adulthood including individuals with special needs
72. Examine family living/parenthood occupations
73. Examine various child care options
74. Locate/utilize family living and parenthood resources

CONSUMER EDUCATION
75. Determine the decision-making process in planning for expenses, savings and managing finances
76. Identify consumer rights and responsibilities
77. Evaluate advertising, warranties, written contracts and quality of goods and equipment
78. Examine consumer education related occupations
79. Locate and/or utilize consumer education resources for assistance

TEXTILES AND CLOTHING
80. Recognize the relationship between appearance and self concept
81. Plan a wardrobe and prepare a clothing budget
82. Identify fabrics, fabric construction, finishes and care
83. Identify elements and principles of clothing design
84. Demonstrate use and care of sewing machine and equipment in a safe manner
85. Follow preparation procedures for constructing and evaluating a garment project
86. Demonstrate repair, alteration and recycling methods
87. Describe cleaning and storage methods
88. Examine textiles and clothing related occupations
89. Evaluate clothing and accessory purchases
90. Locate and/or utilize textiles and clothing resources for assistance

CHILD DEVELOPMENT
91. Examine parenting responsibilities
92. Describe sexual reproduction and birthing process
93. Analyze contraception and family planning methods
94. Discuss health concerns and needs at various stages of prenatal and postnatal development
95. Identify the additional risks of teen pregnancy and parenting
96. Describe ways to guide the physical, social, emotional, and intellectual development of children including those with special needs
97. Select toys, equipment, food and materials appropriate for the development stage of a child
98. Select and use appropriate child guidance techniques
99. Identify types of child abuse, neglect and intervention options
100. Discuss childhood diseases and immunization procedures
101. Examine child development related occupations
102. Identify ways to provide a safe environment for a child

103. Locate and/or utilize child development resources for assistance

CORE COMPETENCIES

104. Leadership competencies

105. Job getting, job keeping competencies

106. Entrepreneurship competencies

PART III: DIRECTIONS

The following items 107-136 relate to you and your profession. Please answer the following according to the choices given. Darken response "1" for those that DO APPLY and "5" for those that DO NOT APPLY.

Years as an educator:

107. 1-5 years
108. 6-10 years
109. 11-20 years
110. 21-30 years
111. 31 plus

Highest Degree Held:

112. Bachelor's Degree
113. Master's Degree
114. Doctoral Degree

Have you attended any of the following:

115. An in-service on distance education through the STAR Schools Vocational Curriculum Institutes
116. A Star Schools in-service workshop on teleteaching methodology
117. An "in-house", area education agency or other session on teleteaching/distance education

How HAVE you learned to use the teleteaching classroom?

118. In-service
119. Self-taught from printed material
120. Viewed a how-to-do-it video tape
121. From other teachers
122. From technicians
123. Preservice teacher education course
124. Graduate teacher education course

How would you PREFER to learn and/or improve your skills in the teleteaching classroom?

125. In-service
129

126. Self-teaching from printed material
127. Viewing from a how-to-do-it video tape
128. From other teachers
129. From technicians
130. Preservice teacher education course
131. Graduate teacher education course

How would you **PREFER** to teach a teleteaching interactive class

132. With one or two simultaneous remote sites
133. With three to five simultaneous remote sites
134. With six or more simultaneous remote sites
135. With "turn teaching" where each teacher involved takes responsibility for a segment of the class.
136. With "team teaching" where each teacher is involved at all instructional sessions.
APPENDIX B. HUMAN SUBJECTS APPROVAL FORM
Information for Review of Research Involving Human Subjects
Iowa State University

(Please type and use the attached instructions for completing this form)

Knowledge, attitudes and teaching practices of family and consumer sciences secondary school educators toward the use of interactive
distance education technology when incorporating curriculum competencies.

1. Title of Project:

2. I agree to provide the proper surveillance of this project to insure that the rights and welfare of the human subjects are protected. I will report any adverse reactions to the committee. Additions to or changes in research procedures after the project has been approved will be submitted to the committee for review. I agree to request renewal of approval for any project continuing more than one year.

Lemonia Nitsa Bigilaki 4-18-1995 Nitsa Bigilaki
Typed Name of Principal Investigator
Family and Consumer Sciences
Department
Education and Studies
Campus Address
MacKay Hall 219 294-1172

3. Signatures of other investigators
Margaret Torrie 4-18-1995 Major Professor

4. Principal Investigator(s) (check all that apply)
☐ Faculty ☐ Staff ☑ Graduate Student ☐ Undergraduate Student

5. Project (check all that apply)
☐ Research ☑ Thesis or dissertation ☐ Class project ☐ Independent Study (490, 590, Honors project)

6. Number of subjects (complete all that apply)
259 Adults, non-students ☐ # ISU student ☐ # minors under 14 ☐ other (explain)
☐ # minors 14 - 17

7. Brief description of proposed research involving human subjects: (See instructions, Item 7. Use an additional page if needed.)

(See Attached)

(Please do not send research, thesis, or dissertation proposals.)

8. Informed Consent:
☐ Signed informed consent will be obtained. (Attach a copy of your form.)
☑ Modified informed consent will be obtained. (See instructions, item 8.)
☐ Not applicable to this project.
9. Confidentiality of Data: Describe below the methods to be used to ensure the confidentiality of data obtained. (See instructions, item 9.)

All answers will be analyzed and reported so as to maintain confidentiality. The data will be analyzed only in the aggregate by sections (secondary school educators' levels of knowledge, ability, feelings and beliefs about whether or not high school Family and Consumer Sciences curriculum competencies can be taught through the Iowa Communication Network (ICN) system. All questionnaires will be destroyed when the research is completed (May 30, 1996).

10. What risks or discomfort will be part of the study? Will subjects in the research be placed at risk or incur discomfort?

Describe any risks to the subjects and precautions that will be taken to minimize them. (The concept of risk goes beyond physical risk and includes risks to subjects' dignity and self-respect as well as psychological or emotional risk. See instructions, item 10.)

Secondary school educators will suffer no physical or psychological risks or discomforts as a result of this study. Data will be collected using mailed questionnaires sent to subjects to complete. Secondary school educators may choose not to participate in this study (see letter).

11. CHECK ALL of the following that apply to your research:

- A. Medical clearance necessary before subjects can participate
- B. Samples (Blood, tissue, etc.) from subjects
- C. Administration of substances (foods, drugs, etc.) to subjects
- D. Physical exercise or conditioning for subjects
- E. Deception of subjects
- F. Subjects under 14 years of age and/or
- G. Subjects in institutions (nurbing homes, prisons, etc.)
- H. Research must be approved by another institution or agency (Attach letters of approval)

If you checked any of the items in 11, please complete the following in the space below (include any attachments):

Items A - D Describe the procedures and note the safety precautions being taken.

Item E Describe how subjects will be deceived; justify the deception; indicate the debriefing procedure, including the timing and information to be presented to subjects.

Item F For subjects under the age of 14, indicate how informed consent from parents or legally authorized representatives as well as from subjects will be obtained.

Items G & H Specify the agency or institution that must approve the project. If subjects in any outside agency or institution are involved, approval must be obtained prior to beginning the research, and the letter of approval should be filed.
Checklist for Attachments and Time Schedule

The following are attached (please check):

12. ☑ Letter or written statement to subjects indicating clearly:
   a) purpose of the research
   b) the use of any identifier codes (names, #’s), how they will be used, and when they will be removed (see Item 17)
   c) an estimate of time needed for participation in the research and the place
   d) if applicable, location of the research activity
   e) how you will ensure confidentiality
   f) in a longitudinal study, note when and how you will contact subjects later
   g) participation is voluntary; nonparticipation will not affect evaluations of the subject

13. ☐ Consent form (if applicable)

14. ☐ Letter of approval for research from cooperating organizations or institutions (if applicable)

15. ☑ Data-gathering instruments

16. Anticipated dates for contact with subjects:

<table>
<thead>
<tr>
<th>First Contact</th>
<th>Last Contact</th>
</tr>
</thead>
</table>

17. If applicable: anticipated date that identifiers will be removed from completed survey instruments and/or audio or visual tapes will be erased:

<table>
<thead>
<tr>
<th>Month / Day / Year</th>
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<tbody>
<tr>
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18. Signature of Departmental Executive Officer  
Date Department or Administrative Unit  

19. Decision of the University Human Subjects Review Committee:

☑ Project Approved  
☐ Project Not Approved  
☐ No Action Required  

Patricia M. Keith  
Name of Committee Chairperson  
Date Signature of Committee Chairperson
APPENDIX C. CODING VARIABLES OF THE QUESTIONNAIRE
USE OF INTERACTIVE DISTANCE EDUCATION TELETEACHING TECHNOLOGY FOR FAMILY AND CONSUMER SCIENCES COMPETENCIES

VARIABLE LABELS

know1 "Distance education interactive teleteaching technology"
know2 "Techniques for integrating academics and technology into family and consumer sciences"
know3 "Equipment use in interactive teleteaching"
know4 "Applications of distance education teleteaching to family and consumer sciences"
know5 "Creating teleteaching plans for distance education"
abi16 "Evaluate mini-lessons taught via distance education interactive teleteaching"
abi17 "Operate the equipment utilized in an interactive teleteaching classroom"
abi18 "Speak clearly with adequate volume, and tone appropriate for teleteaching"
abi19 "Handle the unexpected technical problems with ease"
abi10 "Employ a variety of teaching strategies via interactive teleteaching"
abi11 "Attend to classroom management responsibilities at separate teleteaching sites"
abi12 "Use interactive teleteaching to supplement a traditional class with a guest speaker"
abi13 "Use interactive teleteaching to present an entire course"
int14 "Team teacher outside the FCS discipline?"
int15 "Team teacher within the FCS discipline?"
int16 "Guest speaker from an outside agency?"
int17 "Job interview of students by professionals?"
int18 "Panel of employers prepared to address student questions?"
fee19 "Interactive teleteaching is too complicated for me to do"

fee20 "Interactive teleteaching should be used in all FCS subject areas"

fee21 "I am uncomfortable when I use interactive teleteaching equipment"

fee22 "I feel uneasy teaching through interactive distance education"

fee23 "I prefer using interactive distance education with students who have previously experienced learning in this way"

fee24 "Using interactive teleteaching for instruction makes teaching and learning too mechanical"

fee25 "I consider myself informed about the use of interactive teleteaching in the schools"

fee26 "Interactive teleteaching does not allow social interaction in a class"

fee27 "Interactive distance education is a valuable teaching method for Family and Consumer Sciences courses"

bel28 "Identify recent trends in housing"

bel29 "Explain basic financial and legal aspects of housing in various demographic situations"

bel30 "Evaluate housing alternatives"

bel31 "Examine design principles and elements"

bel32 "Identify qualities of home furnishings and appliances"

bel33 "Examine home furnishings-home management related occupations"

bel34 "Locate and/or utilize home furnishings and equipment resources"

bel35 "Demonstrate safety, sanitation, security, and first aid procedures"

bel36 "Identify procedures in planning for expenses, saving and managing finances"

bel37 "Use equipment and supplies with proper procedures"
"Apply the principles of management in the home"

"Examine food related occupations"

"Analyze nutritional needs and select foods for good health throughout life"

"Prepare foods from the basic food groups"

"Plan menus, prepare shopping list and purchase food"

"Plan, prepare, serve and evaluate a meal"

"Utilize basic kitchen skills in food preparation and storage"

"Apply the principles of sanitation, recycling and safety when working with food and equipment"

"Analyze fad diets and eating disorders"

"Identify various cultural and regional cuisines"

"Locate and/or utilize food and nutrition resources"

"Evaluate consumer health options"

"Explain the basic skills necessary to maintain personal, physical, and mental health"

"Identify personal safety and survival skills"

"Identify substance abuse, use and non-use"

"Describe procedures for prevention and control of diseases"

"Identify the needs and concerns of populations with special needs"

"Examine family/individual health related occupations"

"Locate and/or utilize family/individual health resources"

"Analyze strategies for developing a positive self concept"

"Demonstrate alternative ways of effective communications"
bel59 "Describe ways to build good interpersonal relationships with others"

bel60 "Identify risks of sexual activity"

bel61 "Identify the ways to balance work, family and individual needs"

bel62 "Identify sex-role stereotyping and means of dealing with them"

bel63 "Identify types of sexual abuse and sexual harassment, and intervention options"

bel64 "Identify and demonstrate response to family problems and crisis"

bel65 "Identify various family patterns and lifestyles"

bel66 "Develop short and long-term planning, goal-setting and decision making skills"

bel67 "Locate/utilize resources for populations with special needs"

bel68 "Develop problem-solving techniques"

bel69 "Identify ways to deal with peer pressure"

bel70 "Describe ways to strengthen family relationships"

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bel73 "Examine various child care options"

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bel76 "Identify consumer rights and responsibilities"

bel77 "Evaluate advertising, warranties, written contracts and quality of goods and equipment"

bel78 "Examine consumer education related occupations"
Bel79 "Locate and/or utilize consumer education resources for assistance"

Bel80 "Recognize the relationship between appearance and self concept"

Bel81 "Plan a wardrobe and prepare a clothing budget"

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Bel98 "Select and use appropriate child guidance techniques"
bel99 "Identify types of child abuse, neglect and intervention options"

bel100 "Discuss childhood diseases and immunization procedures"

bel101 "Examine child development related occupations"

bel102 "Identify ways to provide a safe environment for a child"

bel103 "Locate and/or utilize child development resources for assistance"

bel104 "Leadership competencies"

bel105 "Job getting, job keeping competencies"

bel106 "Entrepreneurship competencies"

ye107 "1-5 years"
ye108 "6-10 years"
ye109 "11-20 years"
ye110 "21-30 years"
ye111 "31 plus"

ba112 "bachelor's degree"
m113 "master's degree"
d114 "doctoral degree"

at115 "An in-service on distance education through the STAR Schools Vocational Curriculum Institutes"
at116 "A Star Schools in-service workshop on teleteaching methodology"
at117 "An "in-house", area education agency or other session on teleteaching/distance education"

le118 "In-service"
le119 "Self-taught from printed material"
le120 "Viewed a how-to-do-it video tape"
le121 "From other teachers"
le122 "From technicians"
le123 "Preservice teacher education course"
le124 "Graduate teacher education course"

pr125 "In-service"
pr126 "Self-teaching from printed material"
pr127 "Viewing from a how-to-do-it video tape"
pr128 "From other teachers"
pr129 "From technicians"
pr130 "Preservice teacher education course"
pr131 "Graduate teacher education course"
pr132 "With one or two simultaneous remote sites"
pr133 "With three to five simultaneous remote sites"
pr134 "With six or more simultaneous remote sites"
pr135 "With "turn teaching" where each teacher involved takes responsibility for a segment of the class"
pr136 "With "team teaching" where each teacher is involved at all instructional sessions"
ANOVA: Effect of the way of learning to use the teleteaching classroom* on beliefs

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*Groups are: in-service, self-taught from printed material, and from other teachers

Small number of respondents in each group: in-service (N=15); self-taught from printed material (N=5); from other teachers (N=14).
## Factor Analysis for competency subunits

<table>
<thead>
<tr>
<th>Factor and Item Concepts</th>
<th>Varimax Loading</th>
<th>Mean</th>
<th>Reliability (Cronbach Alpha)</th>
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<td><strong>HOUSING AND HOME MANAGEMENT</strong></td>
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<td><strong>Factor 1: Decision Making</strong></td>
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Factor Analysis for competency subunits (continued)

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Factor Analysis for competency subunits (continued)

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