# Teaching and Learning Family and Consumer Sciences through K-W-L Charts

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*While much of the control and many of the activities found in today's classrooms have been placed in the hands of the learners and learning has become inquiry-based, there remains a need for teachers to use teaching tools that would facilitate this student-centered teaching process. This article identifies the K-W-L Chart as one such tool and follows a case study of four Kuwaiti 'Family and Consumer Sciences' teaching/learning events to evaluate their ability to enhance the learning outcomes of eight students. The research was designed from a qualitative, multi-tiered design approach and was assessed through a constant comparative method of data analysis of interview responses, classroom observations and worksheet-assessments. The results showed that the use of K-W-L Charts influenced the teachers and learners toward a more inquiry-based approach and facilitated a more student-centered and collaborative learning environment, raising the level of interest and the amount of personal input given by the students.*

In Kuwait, many classroom activities have commonly been conducted mainly through 'chalk-and-talk' presentations in which the learners' only involvement has been is listening, reading and writing. The most common teaching tools have been maps, texts, and pictures. However, there is currently a move towards alignment with teaching approaches used in other countries where a student-centered approach to teaching has replaced the traditional teacher-centered approach. In this new teaching environment teachers are expected to act as facilitators and motivators of learning (Labaree, 2000; Richetti, & Sheerin, 1999) for students who are seen and treated as individuals who already possess unique perceptual frameworks about the subject (Martin, Sass, & Schmitt, 2012), who have unique learning styles (Kolb, 1984) and who have a desire to construct their own meaning about the subject (Meyers, & Jones, 1993).

In the context of Kuwait's Family and Consumer Sciences curriculum area, there is the added challenge of meeting the demands of globalization while retaining Kuwait's traditional respect and roles for women in resource management, fashion design, internal design, hospitality and tourism, food and feeding, and family education. Faced with these changes and challenges in teaching FCS, there is a need for the development of teaching tools specifically designed to facilitate the new teaching/learning process. The K-W-L Chart is one such tool. There is also a need to assess and evaluate the willingness and ability of teachers to use such tools in their teaching practice, because, unless teachers are willing and competent using these tools, their availability would be of little value.

Developed by Carr and Ogle (1987) the K-W-L was specifically designed to enable students to identify and activate their own prior knowledge, set their own learning goals, and be able to identify the new knowledge learned (Al-Shaye, 2002).

In the context of a teaching/learning event, the K-W-L Chart (Figure 1) is used as a worksheet on which students identify the progressive stages of knowledge acquisition about a given topic.

Figure 1.
*K-W-L Chart.*

| K | W | L |
| --- | --- | --- |
| Knowledge Known | Knowledge Wanted | Knowledge Learned |

K:    The K column is used as a pre-learning activity, in which students brainstorm and write down what they already know about the current topic. During this activity, the teacher prompts the students through interactive questions and discussion, and students are encouraged to categorize and subcategorize the information recalled.

W:    The W column is also used as a pre-learning activity. Students are encouraged to brainstorm and write down what more they want to learn about the current topic. This activity is often facilitated through small groups, class discussions, or teacher-prompted question-and-answer sessions so that students are encouraged to find personal reasons for wanting to learn more about the current topic.

L:    The L column is used as a post-learning activity, in which the students consider what they have learned about the topic as a result of the lesson. This activity is often facilitated through continuous individual learning, revision and recall, through group activities, or through teacher-student interaction. Also by relating the L column activity with the K and W columns, students are provided opportunity to measure the gap between what was desired in learning and what has been learned and to initiate new questions and establish new aims for their learning. This then leads to further development of the K-W-L Chart. The combination of the K-W-L Charts in a given topic will then provide an accurate assessment of the students' progression of knowledge and learning over a longer period than a single lesson.

This article identifies the primary theories undergirding the use of K-W-L Charts and reports on a case study of four Family and Consumer Sciences teaching/learning events and the learning experiences of eight students in Kuwait. It then evaluates the effectiveness of K-W-L Charts in terms of their ability to shape the preparation and delivery of student-centered classroom teaching/learning experiences, promote student interest and participation, and facilitate positive learning outcomes.

**Theoretical Framework**

The importance of prior knowledge and the capacity to activate that knowledge has been well established (Ausubel, 1968; Beck, Omanson, & McKeown, 1982; Gillani, 2003). Of primary importance was Ausubel's (1968) theory that the "… assimilation, progressive

differentiation and integrative reconciliation …" of new and established information is dependent on the identification of prior knowledge and the understanding of the relationship between what is known and what can be known. That these theories draw on basic constructivist principles can be seen in the finding that, during interactions between the learners and the environment, learners are capable of actively finding out novel and advanced strategies for learning (Hess, & Trexler, 2005; Siegler, & Ellis, 1996). Given that learning involves cognitive development and the rearrangement of mental schema (Piaget, 1976; Silverman, 2002), schema theory sought to explain the constructive process through which meaning is constructed by learners. Lipson and Wixson (1991) explained that meaning is developed from within the learner, whom they described as 'the reader,' the text, and the context. For them, the development of meaning begins with learners accessing their information storage system (Lipson, & Wixson, 1991), which Ausubel (1968), Anderson (1977) and Gagne (1985) would call "prior knowledge," and continues to develop as each learner chooses to retrieve specific information from that storage (Zintz, & Maggart, 1984), a process that demands choice and selection based on perceived relevancy of that stored information to the current input. The interchange that takes place between the learner, prior knowledge, and new knowledge was described by Rumelhart (1977) through schema theory and linked by Maria (1990) to the general theory of knowledge and memory.

Research findings about the role of prior knowledge and about learner-perceived relevance of new information, led educators to see the learning environment as a collaboration of variables related to student, text, context, and teacher (Idol, 1988; Lipson, & Wixson, 1991). This realization then was able to help teachers to see reading, for example, as an interactive activity through which learners construct meaning from the text by logically linking what is already known with clues within the text (Anderson, Hiebert, Scott, & Wilkinson, 1985; Pearson, 1985). That the K-W-L Chart empowers students to construct their own learning by linking prior knowledge to newly acquired knowledge and thereby enable them to create personal meaning confirms their alignment with both schema and constructivist learning theory.

**Effective Use of K-W-L Charts**

K-W-L Charts have been praised for their ability to adapt to different types of information (Camp, 2000), different degrees of learner potential and achievement (Czajkowski, 2000), and to a range of learner attitudes towards different subjects (Williams, & Burden, 1997). They have also been commended for their flexibility to meet the requirements of different curriculum areas including physical science (Williams, 2006), social science (Czajkowski, 2000), and reading comprehension, self-expression, and vocabulary (Elliott, Formhals, & Wheat, 2002; Tonks, & Taboda, 2011) across a range of grades (Houtz, & Quinn, 2010).

They have also been praised for their effectiveness and efficiency in helping teachers facilitate group-work activities and to act as a stimulus-tool to encourage individual thinking and evaluation, the sharing of knowledge gained through reading, and the identification of what is yet unknown and therefore needing to be learned (Johnson, Johnson, Holub, & Roy, 1984). Moreover, Burns' (1994) study on the effect of K-W-L Charts as a reading strategy for 52 fifth graders, showed that after six weeks the K-W-L Charts had a positive effect on the learners' interaction skills and reading comprehension and some positive effect on reading attitudes (Burns, 1994).

In regard to the efficiency and effectiveness of K-W-L Charts to promote learning through writing, Brown and Day (1983) showed that they also had a positive effect on students

being able to plan their personal written expression of a specific topic. According to Carr and Orgle (1987), K-W-L Charts provided opportunity for the students to write about their newly acquired knowledge, along with their previous knowledge base, in a manner that was both systematically structured and appropriately detailed. For Camp (2000) the effectiveness of the "L" column in the K-W-L Chart was found in its ability to raise students' awareness after the lesson, to the details of the new information they had learned through the activity.

Evidenced by the findings of these research studies, the bottom-line advantage of K-W-L Charts is the potential for teachers to move the learning environment away from being teacher-centered to one that is student-centered, and from instruction that is based on chalk-and-talk to an interactive event that is based on the acceptance by the individual students of their responsibility to own and design their own learning through co-operation with peers, texts, contexts, and teachers.

The research reported here is part of a larger study of the use of graphic organizers (Alshatti , Watters, & Kidman, 2010). The aim of this component of the study was to explore the following research questions:

1. How does the use of K-W-L Charts influence the teacher's approach, preparation and delivery of the lesson?
2. How does the use of K-W-L Charts influence the student's motivation, class participation, learning strategies and learning outcomes?
3. What strengths and limitations do FCS teachers and students experience when using K-W-L Charts in the FCS curriculum area?

## Methodology

In response to Creswell's (2008) expectation that research be directly linked to the specific research problem, that it be contextually relevant to the participants and unbiased in its reporting, this research was designed using a multiple qualitative, multi-tiered approach in which the perspectives of the researcher, participant teachers, and students were collected, collated and considered. This approach ensured that the K-W-L was evaluated from a Kuwaiti perspective, with specific attention paid to its effectiveness as a teaching and learning tool, to the changes its' use makes to the preparation and delivery of the lesson, to student interest and participation during the lesson and to the outcomes of the lesson from the perspectives of both teacher and learner. To maximize the contextualization of this study all preparatory instructions, lesson materials, lessons, and interviews were conducted in Arabic and all observations and analyses carried out by Kuwaiti nationals. The study was conducted over a four-week period commencing in November 2010.

### Selection of Participants

A brief three-part questionnaire was prepared by the researcher and given to all available FCS Teachers in Kuwait. The first section of the questionnaire collected data concerning each respondent's teaching history, in terms of general teaching experience, FCS teaching experience, measured in years, and the respondent's current experience in terms of district, school, and grade. The second section of the questionnaire contained open-ended questions that explored the teachers' knowledge of K-W-L Charts, their opinions about the potential value of K-W-L Charts in the classroom, and their current usage of K-W-L Charts. The questions also explored the teachers' opinions concerning the current quality of FCS teaching in Kuwait schools and their

suggestions about ways to resolve their concerns about Kuwaiti teaching practices. The third section of the questionnaire investigated each teacher's current classroom strategies.

From the 192 respondents who completed the questionnaire, priority was assigned to teachers with the most teaching experience, with specific experience with teaching Grade 6 FCS, interest to attend a professional development (PD) program and knowledge about potential reform strategies, but no prior firsthand experience with K-W-L Charts. Following the receipt of a letter of approval from the District Education Office of Mubarak Al Kabeer, four female teachers from four different Kuwaiti intermediate girl schools and their classes were selected to participate in this research. Teacher 1 had 3 years experience in teaching Grade 6 FCS, Teachers 2 and 3 had 5 years experience in teaching Grade 6 FCS, and Teacher 4 had 10 years experience in teaching Grade 6 FCS. Two students aged from 10 to 11 years old, from each of four classes of twenty-two, were selected by their teacher, by a random casting of lots. A total of eight students were selected. Although there was no overt decision to choose equally academic students for this study, that this was the first year of learning FCS subjects for each student, was taken to indicate some level of consistency in the students' prior knowledge. Written consent from the selected students and their parents was obtained prior to the students' participation in the study.

**Professional Development Program**

In the first tier of the study, all participating teachers attended a 12 hour PD program conducted over three consecutive days, held in the Mubarak Al Kabeer district education office. The PD program was conducted by the researcher. During the PD the participating teachers investigated the primary features of K-W-L Charts, analyzed the relationship of the theories of cognitive and conceptual learning to the use of K-W-L Charts, and discussed the potential benefits of using K-W-L Charts in FCS. After developing their own K-W-L Charts, the teachers discussed concerns about potential difficulties and limitations related to the design and implementation of K-W-L Charts in their lessons and collaboratively refined each other's K-W-L Chart to maximize its potential in each lesson.

In the second tier of the study, each teacher constructed a lesson lasting 45 minutes from the fashion design unit in the FCS curriculum area. Teachers 1 and 3 were assigned the topic, 'the importance of fashion.' Teachers 2 and 4 were assigned the topic, 'organizing your wardrobe.' The teachers were expected to research, develop, and prepare their own teaching resources including, visual presentations, lesson material, and student worksheets. During the lesson, students were encouraged to use the K-W-L Charts as a learning tool. During the lesson, the researcher recorded her observations about the teacher's use of the K-W-L Chart in the lesson as well as the students' interest, attitudes, and classroom participation. To ensure that observations and notations were unbiased and non-selective, all observation practices were directed by the pre-lesson interview questions and the recommendations of established literature (Horizon Research Inc, 2002). Moreover, all observations were guided by the teacher's lesson-plan. In all lessons, the observer assessed and evaluated the degree to which the teacher used the K-W-L Chart to create an interesting and attention-capturing lesson, the degree of influence the use of the K-W-L Chart had on the students' willingness and ability to identify and list their prior knowledge and desired learning direction. The observer also assessed the effectiveness of the K-W-L Chart to promote the students' enthusiasm and participation in the lesson and, in the closing portion of the lesson, to enable the students' to demonstrate what they had learned. In addition to the researcher's notes about the lesson itself, all observation-notations included school codes,

teacher codes, subject and unit information, and the date and time of the observation. In accordance with Merriam (1998), audio recordings were kept of all the observer's comments to enable interpretation of the notes to be carried out later without being influenced by the observer's assumptions, persuasions, and outcome-preferences.

**Data Collection**
Data were collected at five different stages of the study.

1. Before the PD, a questionnaire was completed by each teacher about her knowledge about K-W-L Charts and her previous experiences with K-W-L Charts.

2. The day after the PD program but before the lesson, teachers participated in an interview lasting approximately 1 hour, during which a number of closed and open-ended questions were asked in a face-to-face, semi-structured format designed to assess the teacher's knowledge and skills related to the use of K-W-L Charts that she would take into the teaching event. The teachers were asked about the degree to which the PD program had helped them to understand the students' needs in FCS and about the appropriateness of the teaching and learning strategies taught in the PD, in terms of their ability to meet the teaching and learning goals of FCS. They were also asked to express their sense of increased competency in using K-W-L Charts in the classroom as a result of the PD program. All pre-implementation interviews were audio recorded and transcribed for the analysis.

3. During each classroom lesson, the researcher noted her observations about the teacher's demonstrated comfort, knowledge, and use of K-W-L Charts as well as about the students' demonstrated attitudes, interest, and participation.

4. Immediately following each lesson, student worksheets were collected and assessed to evaluate each student's use of K-W-L Charts in the context of the lesson. These completed worksheets were analyzed for the accuracy of the data presented, the alignment of the concepts included with those taught during the lesson, and the completeness of the students' worksheet presentation. Each worksheet was also assessed for the degree to which it demonstrated the student's independent learning style and strategies, rather than showing that the student had merely learned by rote.

5. Following each lesson, both teachers and students were interviewed (post lesson interviews) and their responses noted. Each teacher interview was conducted in a face-to-face, semi-structured format in which the questions were again mostly open-ended (Creswell, 2008). The teachers were asked to evaluate the PD program and the subsequent support in terms of preparing them to use the K-W-L Chart in the lesson. They were also asked to describe the influence that the K-W-L Chart had on their teaching techniques and confidence in presenting the lesson. Each teacher was then asked to identify, what she saw to be the main advantages and disadvantages of using K-W-L Charts in place of the traditional methods used in Kuwait. These interviews were also audio-recorded and transcribed for analysis. The students' interviews were also conducted in a face-to-face, semi-structured, format conducted by the researcher, lasting 5 minutes each. During the interview each student was asked a series of open-ended questions about their current appreciation of the K-W-L Chart used in the lesson, in terms of its effect

on their classroom participation, attitudes, and learning. The students were asked to identify any discernible changes in their own classroom participation and attitudes that might be due to the inclusion of the K-W-L Chart. They were asked to describe the ways in which the use of the K-W-L Chart helped them to learn about the topic of the lesson. All student responses were audio recorded and later cross-referenced with the observer's notes for verification.

All interviews were conducted, recorded, and transcribed in Arabic. The data were then translated into English by two independent translators, both of whom were bilingual, with Arabic as their first language and English their second. The English translations were then synthesized, by the two translators and the researcher to form one English document, which was then checked for precision against the original Arabic version.

**Data Analysis**

All data collected from interviews, observations, and student worksheets were analyzed for evidence about the degree of influence exerted by the use of the K-W-L Chart on the teachers' approach to and methods of practice in the teaching/learned event. All data were also analyzed for evidence about the degree of influence the use of the K-W-L Chart had on students' interest in the topic, motivation to learn, and participation in the classroom learning activities as well as on their learning outcomes and the students' sense of achievement and self-esteem. The data analysis process was by a "constant comparative" method of analysis (Corbin, & Strauss, 2008; Glaser, & Strauss, 1967; Merriam, 1998) where sentences and paragraphs were examined to identify themes and specific codes. In accordance to the expectations of Creswell (2008) concerning analysis strategies, the researcher examined each response and assigned a code word or phrase that accurately and concisely identified the significance of the response to the overall goal of the research and to the research questions. In accordance to the expectations of Merriam (1998), the researcher then examined all codes to identify similarities and differences implied by the responses and collated similar codes under a clearly defined mono-dimensional category. Unnecessary categories were removed and repeated responses were noted. These categories were then analyzed for consistency of focus and a single main theme was determined. The identified main theme of this research was 'the effectiveness of K-W-L Charts.' A summary of the data analyses and researcher's reflections was then compiled.

**Results**

The results of the study were identified through an analysis of the data collected through the prescribed questionnaire prior to the PD Program, an assessment of the PD Program, the pre- and post-lesson teacher-interviews, and an analysis of the observer's notes made during each lesson as well as the post-lesson student-interviews and an analysis of the student worksheets following the lessons.

**Questionnaire**

In respect to Research Question 1 "What experience do FCS teachers have in planning and implementing teaching activities build around the use of K-W-L Charts?" a number of specific questions were asked, the data analyzed, and a number of results identified. When asked to identify specific pedagogical practices that currently established connection between individual student's established knowledge and new concepts, 82% of the teachers said that their

current teaching strategies in this area were limited and that they rarely involved teaching approaches that linked new knowledge to the students' prior knowledge. Eighteen percent of teachers did not give a response at all.

In response to the question, "What changes do you think are necessary to improve the teaching of FCS?" 79% of the teachers pointed to methods that would improve their students' involvement and motivation. Twenty-four percent identified the need to have activities that are of personal interest to the students. Twenty-seven percent of teachers suggested that greater use of audio-visual aids would not only generate student interest, but would also have a positive impact on teaching and learning. In response to the question, "Which strategy do you think would be more effective and why?" 86% of the teachers pointed to student-centered cooperative group-work, collaborative discovery, and the promotion of student-directed discussions, 21% of teachers considered these student-centered strategies to be effective in encouraging students to contribute their own ideas about the topic learned, and 19% of the teachers said they valued the way student-centered strategies made teaching and learning fun and interesting for the students. When asked to describe the type of assistance they would need to improve their range of FCS teaching strategies, 77% of the teachers referred to the provision of PD, and 24% of those, voiced their eagerness to attend workshops and courses designed around training in model lessons which utilized innovative and interactive teaching methods. Seventeen percent of the teachers who indicated a desire for a PD program voiced a personal interest in student self-evaluation methods.

**Professional Development Program**

In respect to Research Question 2, "In what ways can Kuwaiti FCS teachers be developed to effectively adopt and adapt the use of K-W-L Charts in their teaching?", the PD program was examined and the data collected was analyzed for evidence of change in the teachers' understanding of K-W-L Charts and the teachers' confidence and competence in the use of K-W-L Charts in the classroom. On Day 1 of the PD program, all the participating teachers demonstrated enthusiasm in the discussions related to the theory of visual and cognitive learning. They then collaboratively explored techniques that could be used to apply visual and cognitive learning theories in a student-centered classroom. While all four teachers found the theories to be new, they were able to acknowledge the importance of involving visual and cognitive learning tools in their FCS classrooms. Time management was raised as a major concern because of the potential of the K-W-L Chart promoting extra questions and discussions from the students. After collaboratively exploring the concepts, in the topic 'Waste Disposal and Recycling,' the researcher and the teachers identified 'collection of used empty glass bottles,' 'breaking down the glass into smaller pieces,' 'melting the crushed glass in an oven,' and 'reproducing new glass bottles using the molten glass' as the primary processes in the topic. The researcher and the teachers co-operatively integrated the key concepts in the topic into the sample K-W-L Chart. The researcher then assigned the teachers homework tasks based around a new topic, 'organizing your wardrobe,' to further develop teacher competency in integrating key concepts in the topic into a student-centered lesson involving the K-W-L Chart.

During Day 2, each teacher presented her homework to the group and the researcher and teachers discussed ways to improve the integration of the K-W-L Chart in that topic. All teachers demonstrated an appropriate understanding of each of the columns in the K-W-L Chart. All teachers were able to use Column 'K' to answer the question "What do I know about organizing my wardrobe?", Column 'W' to answer the question "What do I want to learn about the

organizing my wardrobe?", and Column 'L' to list what they had learned during the lesson. That each teacher included entries in each column that were personally motivated, demonstrated to the teachers the ability of the K-W-L Charts to develop student-directed learning.

On Day 3, each teacher selected a specific topic from the FCS curriculum to teach. Teachers 1 and 3 selected as their topic, 'the importance of fashion.' Teachers 2 and 4 selected as their topic, 'organizing your wardrobe.' The teachers who had selected the same topic collaborated in the planning of each lesson. The teachers and the researcher then collaboratively refined the strategies for using the K-W-L Chart in the lesson. The final lesson plans presented by each teacher demonstrated an appropriate level of competence and confidence gained through the PD program.

The evidence provided by the teacher's participation, enthusiasm, and final lesson plans confirmed the influence of the PD program to develop the teachers' understanding of the theories taught during the first portion of the PD program, promote teacher competence and confidence in using the K-W- L Chart to promote discussion, elicit questions, and encourage participation during the lesson.

**Teacher Interviews and Observations**

In respect to Research Question 3, "What strengths and limitations do FCS teachers and students experience when using K-W-L Charts in the FCS curriculum area?", data was collected from pre- and post-lesson interviews and observations and analyzed for evidence of change in the teachers' understanding of K-W-L Charts, as well as teacher-confidence and competence in the use of K-W-L Charts in the classroom. The interview responses showed that all the participating teachers believed that their use of the K-W-L Charts in their lessons had been effective in meeting the goals of the Family and Consumer Sciences curriculum area. The teachers also affirmed the positive influence that the K-W-L Charts had had on their planning and teaching of the lesson as well as on their ability to promote students' interest, classroom participation, and learning.

**The 'K' Column**

All teachers found the 'K' Column to be a useful means to drawing students into a peer discussion about foundational knowledge concerning the topic to be discussed in the lesson. Teacher 1 (Topic – 'the importance of fashion') said it encouraged her students to disclose their current knowledge base and personal experiences with the topic of fashion. Teacher 2 (Topic - 'organizing your wardrobe') echoed these comments, saying that the 'K' column had been most useful for engaging students in a revision of previously acquired knowledge about clothing categories as well as wardrobe design and arrangement strategies. Teacher 2 also commented on the fact that the 'K' column had been so effective in generating interest and discussion in the topic that it had reduced the amount of time that she would normally have spent in introducing the lesson and thereby provided more time to engage the students in peer discussion directly on the topic, through the use of the 'W' column. Teacher 4, who also addressed the topic, 'organizing your wardrobe,' reported finding the 'K' column to be an effective way to encourage students to articulate what they had previously learned and for them to voice their current attitudes to arranging their wardrobes. For Teacher 4, a major advantage of the 'K' column was its effectiveness in drawing all the students into an interactive discussion aimed at refining the accuracy of the previous knowledge attained. She said,

*The 'K' column revealed that a lot of what the students knew about organizing wardrobes was either only partially true or somewhat misinterpreted. But because the activity associated with the 'K' column was a peer discussion, the amendments to each person's thinking were often achieved through the persuasive contributions of the other students.*

The students also considered the 'K' column an asset to their learning. The two students identified as students of Teacher 1, commented that the 'K' column had boosted their egos by providing opportunity for them to voice what they already knew about the subject.

## The 'W' Column

The sequencing of thought promoted by the 'K' and 'W' columns, from what is already known to what new knowledge is desired, was noted as an advantage by all the teachers. Teacher 1 said that it helped the students move from foundational thinking about the topic to a higher level of critical thinking. She said that, prompted by the peer discussion used in conjunction with the 'W' column, students were able to cognitively balance their perceptions about 'the importance of fashion' with 'the need for protection, 'the desire for modesty,' and 'the quest for beauty.' The observer noted that Teacher 1 was also able to use the 'W' column to draw the more difficult students into the discussion and encourage the quieter students by showing that it is normal to need to ask questions. For Teacher 2, the 'W' column was an effective means for eliciting from the students, four primary categories of inquiry associated with the topic: Why do I need to organizing the wardrobe on a regular basis?, What is the correct way of folding clothes in the wardrobe?, What are the steps followed to organizing the wardrobe?, and What are the things that are useful in the organizing of the wardrobe? When asked to identify the most advantageous aspect of using the 'W' column, Teacher 2 said,

*The best part was the ability to help the students reach an agreed list of topics that would be discussed in the lesson. This helped keep the students interested, focused, and motivated during the lesson, because they had had a part in deciding the content of the lesson.*

Teacher 3 further demonstrated the ability of the 'W' column to promote higher critical thinking by empowering her students to ask the more controversial and difficult-to-answer questions, especially concerning designing clothing by using different combinations of fabrics, such as wool and silk. She added, "The number of controversial questions prompted by the use of the 'W' column has proved to me that I need to be well prepared in advance for any question that might be raised in that portion of the lesson." The observer also noted the high number of controversial questions and comments that were raised as a result of the 'W' column, especially concerning 'respect for laws and regulations,' 'satisfying customs and traditions,' and 'the definition of appropriate in the context of personal clothing.' For Teacher 3, empowerment provided by the 'W' column for students to freely discuss controversial issues, and for teachers to monitor the discussions and to support individual student's opinions on all sides of the debate was a true benefit of the K-W-L Chart. These comments were further affirmed by both students. They each independently said that the peer discussion generated by the teacher's use of the 'W,' had raised their level of interest, had encouraged them to participate more in the lesson by providing opportunity for them to raise the issues that were important to them personally, had

increased their critical thinking skills during the peer-discussion phase of the lesson, and increased their capacity for recall. In response to the question, "In your opinion, how was the teaching different in this class?", Student 6 noted that the discussion raised by the 'W' column had encouraged her to rethink her ideas about the appropriateness of color and patterns for specific occasions. She said, "I have always liked bright colors, but this lesson helped me recognize that bright colors are not always suitable for every event, so I guess I need to find some darker colors that I can wear also."

**The 'L' Column**

The 'L' Column was also affirmed by all teachers to be of benefit to student learning. Teacher 1 especially noted it to be a useful tool, not only for students to identify what they had learned in the lesson but also for her to evaluate the effectiveness of the lesson and to set the foundation for the following lesson. She said that all the students had responded enthusiastically through the 'L' column and were able to create their lists quickly. An analysis of student worksheets also confirmed the effectiveness of the 'L' column and, at the same time the effectiveness of the overall use of the K-W-L Chart in terms of learning and the promotion of short term memory. While all students had used the 'L' column to list the information learned from the lesson, a comparison of the students' entries revealed slight differences, which indicated that individual students had been alerted to specific information that satisfied their individual learning needs. Student 5 made special note in the 'L' column of having learned to appreciate the differences related to casual and formal clothing.

For Teacher 3, the 'L' column also revealed a disadvantage of the K-W-L Chart, but qualified her comment by saying,

> *Its disadvantages are not caused by its shape and organization capacity, but by the limited time associated with each lesson. For example, by the end of the lesson, the students had a lot of information to write down in the 'L' column and the limited time of the lesson period (45 minutes) was not sufficient for this activity.*

**The K-W-L Chart as a Whole Activity**

Commenting about the overall effect of the K-W-L Chart, teachers, students, and the observer were in agreement concerning its benefits for teaching FCS subjects. Teacher 3 commented that it had certainly demonstrated an ability to help students develop their powers of persuasion to support their current thinking about the importance of fashion and to learn from each other. She said, "In this lesson students effectively used all three columns in the K-W-L Chart to represent and arrange their specific personal life experiences for the topic importance of fashion." Based on her analysis of her students' worksheets, Teacher 2 concluded that the K-W-L Chart had promoted higher critical thinking about the topic, which for previous students, who had been taught without the K-W-L Chart, had seemed mundane and of little importance. When asked, "What are your perceptions of the way students responded to the lesson through the use of the K-W-L Chart?", Teacher 4 stated that, "Compared to traditional classes, the students were obviously more keen to participate in the learning activities, particularly when using the 'K' and 'W' columns of the K-W-L Chart." She especially emphasized the lack of certain learning problems that were common in classrooms that did not use the K-W-L Chart during group activities. She said,

*The students normally lose their focus when they are involved in any group activities, especially the quieter and less academic students. However, in this lesson, I think the K-W-L Chart provided a support system that enabled the students to remain focused and to stay involved in the peer discussion.*

The comments by the students affirmed those made by the teachers. Student 2, said, "I think the chart progressively helped me organize the information in my mind and helped me see which concepts in this topic about fashion were more important than others." When later asked about the effect that the K-W-L Chart had had on her thinking about wardrobes, Student 3 said,

*The lesson actually got me interested in how my wardrobe looks. I started to think about what changes I could make to my wardrobe so that it was organized in one way during the cold months and in another way in the warmer months of the year.*

In response to the same question, Student 4 said,

*The K-W-L Chart helped me understand that there is always more to learn, even about simple things, like arranging my wardrobe. The lesson helped me learn new things, but it also made me change the way I use to think about some things. And now it has made me interested in learning more about things I had never thought of before, like how important it is to have of fresh air flowing through my wardrobe to stop my clothes from smelling stale in winter.*

Overall, the data collected from the research questionnaire, teacher and student interviews, observations. and student worksheets, showed that the K-W-L Chart has the potential to be a most powerful tool for empowering students to identify their prior knowledge, to articulate their individual desires for learning, to recognize what they had learned, and to be able to express the fact that some of what they had learned had been more meaningful to them personally than other aspects of their learning. The participating teachers were specifically impressed by the ability of the K-W-L Chart's 'K' column to generate interest and motivate students to participate in the lesson from its earliest stages. Both teachers and students voiced an emphatic appreciation of the way the 'W' column provided a space for students to take ownership of the learning process by being able identify the specific concepts within the topic that they would like to investigate. The positive influence of the first two columns of the K-W-L Chart was demonstrated by the high level of student interaction in every lesson during which time all students were able to ask questions of personal interest, based on their individual levels of academics, logic, and curiosity. For many of the teachers, the results of this research demonstrated a breakthrough in the development of a truly student-centered classroom, especially in the light of the fact that most students normally go through stages during which time they are reluctant to admit their limitations in knowledge. All teachers agreed that the success of the learning outcome was primarily due to the ability of the K-W-L Chart to ignite students' personal passions, to raise students' personal issues and questions, and to engage each student in the teaching/learning process more than the traditional approach to the same type of lessons. The challenge to become more proficient and efficient in the use of the K-W-L Chart

was admitted by all participating teachers and all pointed to the PD program as a primary means to develop those proficiencies and efficiencies.

## Discussion and Implications

The findings of the research revealed a general agreement among participating teachers about the need for the K-W-L Chart as a student-centered teaching/learning method in the Kuwaiti education system. Eighty-two percent acknowledged having limited access to student-centered strategies in Kuwait and little experience with teaching approaches that linked new knowledge to the students' prior knowledge due to the strength of traditional worldviews and cultural resistances to many global trends. However, 86% of the participating teachers affirmed the potential impact of student-centered cooperative group-work, collaborative discovery, and the promotion of student-directed discussions. Twenty-four percent specifically identified the need to shape these activities so that they would be of interest and be enjoyable from a student's perspective but would also have a positive impact on teaching and learning.

Each of these percentages is significant because, while they each underscore the influence of cultural belief systems over the desire of individuals to explore new reforms, there is evidence to suggest an approaching breakthrough in reformation strategies once the evidence of success has been confirmed. While this research study was conducted within the context of Kuwait, these findings can be applied to other cultures where traditional and long standing approaches and practices, govern the norms of education, and reformation is approached with caution. The findings of this research, that Kuwaiti teachers are interested in student-centered teaching strategies is also important, especially considering that they are the front-line professionals who are qualified by learning and experience to decide if their students have the ability to take responsibility for their own learning and to develop skills that would enable them to become life-long learners. This finding aligns with the comments by Lumpe, Czerniak, Haney, and Beltyukova (2012) concerning the importance of using the learning and experience of teachers to formulate a benchmark in matters relating to teaching approaches and strategies.

That the teachers in this study reported students enthusiastically engaging in the activities through the different columns of the K-W-L Chart and students being able to identify and use their prior knowledge to determine their personal learning needs, indicates the importance of this study to releasing the potential of student-centered learning to, not only Kuwaiti FCS students, but to students in other countries as well. This notion is supported by similar investigations into educational reforms in the Netherlands (Meirink, Meijer, Verloop, & Bergen, 2009), in which participating teachers were required to adopt student-centered teaching and learning approaches. They found that, following the research experiences, all participating teachers had adopted a positive perception about value of student-centered teaching methods and developed an increased awareness of the need to further develop student-centered strategies through a PD program.

If the argument put forward by Bakah, Voogt, and Pieters (2011), that new reforms in education are successful when teachers are empowered to participate in, and given ample time to refine the reforms, then the agreement among participating Kuwaiti teachers, found in this study, about the need for the K-W-L Chart as a student-centered teaching/learning method is also important and should be enacted with vigor by all educational bodies. It was for this reason, important that the current study provided an opportunity for the participating teachers to identify the specific learning needs of students and through the exploration of the K-W-L Chart, decide if it could help their students to become life-long learners.

Developed around Research Question 2: "In what ways can Kuwaiti FCS teachers be developed to effectively adopt and adapt the use of K-W-L Charts in their teaching?", the PD program was evaluated in terms of its contribution to the "conceptual, empirical, systematic, and sustained inquiry" (Wang, Odell, Klecka, Spalding, & Lin, 2010, p. 400) related to teacher education pertaining to student-centered learning. The work samples created by the teachers during the PD program, together with the observer's notes and the teachers' post-PD comments, were used as the assessment instruments. That all four teachers were able to acknowledge the importance of involving visual and cognitive learning tools in their FCS classrooms was taken as evidence of their understanding of the theories of visual and cognitive learning and their appreciation of the application of those theories to their classroom teaching activities, in particular to creating a student-centered, inquiry-based approach to teaching and learning that focused on individual student-differences. These results affirmed the comment by Fishman, Marx, Best, and Tal (2003) that for PD programs to be effective, they should be focused toward change in teacher knowledge, beliefs, and the adoption of new skills. That the teachers were able to effectively integrate the key concepts of their sample topic, 'organizing your wardrobe,' confirmed the effectiveness of the PD program in developing the teachers' competence and confidence in using the K-W-L Chart components. That, by the end of the three day PD program, all the teachers were eager to integrate what they had learned into their classroom teaching strategies, confirmed Fishman et al. (2003) comment that successful PD programs positively influence teachers' classroom enactment. These findings highlighted the importance of ongoing PD within the education sector. They also showed the importance of developing PD programs that model, in their training approaches, the teaching strategies being taught in the program.

The evidence collected in response to research question 3, "What strengths and limitations do FCS teachers and students experience when using K-W-L Charts in the FCS curriculum area?", clearly affirms the contribution made by this research to educational theory and practice. The interview responses given by the teachers, together with the researcher's observation notes and an analysis of the student worksheets indicated that the integration of the K-W-L Chart into the FCS lessons had had a positive influence on the teachers' pre-lesson research, lesson planning activities, and lesson strategies as well as on the students' participation and learning outcomes. The comments by Teachers 1 and 3 (Topic – 'importance of fashion') that the K-W-L Chart promoted a high level of interaction and peer-discussion related to the benefit of particular clothing styles to the students' own life-experiences are significant, especially in the light of Caskey's (2002) insistence that classroom learning be connected with daily life. Moreover, Teacher 1's comment that the 'W' column proved to be effective in drawing the more difficult students into the discussion while, at the same time ensuring that the quieter students were also able to feel secure in their peer interaction concerning 'the need for protection,' 'the desire for modesty,' and 'the quest for beauty,' along with Teacher 3's comment that the 'W' column had helped students develop their powers of persuasion to support their current thinking about the importance of fashion highlighted the significance of K-W-L Charts concerning the promotion of deeper critical thinking through interactive learning and information sharing.

Equally significant are the comments by Teachers 2 and 4 concerning the ability of the 'W' column Chart to help students reach an agreed list of topics to be discussed in the lesson and provide space for them to articulate their personal attitudes concerning these selected topics. According to Teacher 2, "This helped keep the students interested, focused, and motivated during the lesson, because they had had a part in deciding the content of the lesson." To this,

Teacher 4 added, "Compared to traditional classes, the students were obviously more keen to participate in the learning activities, particularly when using the 'K' and 'W' columns of the K-W-L Chart." These comments confirm the importance, assigned by Lacey (2008), of classroom activities that are directed by students, under the facilitation of teachers, rather than by teachers alone.

Arguably some of the most revealing responses of the entire study concerning the effectiveness of the K-W-L Chart to increase participation and learning, were made by the students. All students reported an appreciation for the positive influence that the K-W-L Chart had had on their learning. For Student 1, the most significant change in her learning resulted from the K-W-L Chart helping her to further develop her critical thinking skills and capacity for recall. For Student 2 it was the way that the K-W-L Chart has helped her to cognitively organize and prioritize the information presented in the lesson. Students 3 and 7 pointed to the way the K-W-L Chart was able to generate interest and enthusiasm among the students. While Students 4 and 6 emphasized the way that the K-W-L Chart had helped them change the way they had previously thought about the concepts taught, Student 5 voiced her appreciation for the way the K-W-L Chart had helped her to differentiate concepts based on an examination of their finer details. Student 8 added to this, saying, "The K-W-L Chart seemed to help the teacher to listen more to what the students thought, but also gave her opportunity to add important details to what we were learning."

These comments made by the students clearly demonstrate the effectiveness of the K-W-L Chart in enabling students to evaluate their own learning, identify the applications for what is learned, and synthesize their new learning, all of which are learning outcomes that have been identified as essential to ongoing learning (Miri, Ben-Chaim, & Zoller, 2007; Weaver, & Qi, 2005; Zydney, 2010).

The analysis of the student worksheets confirmed the teachers and students assessment of the K-W-L Chart and highlighted the contribution it makes to Thorndike's Laws of Effects (Stephens, & Clements, 1998), and Skinner's (1993) educational theory about the impact that the learning-environment has on learning. It also highlights the significance of this study to the understanding of student-centered strategies that will capitalize on individual differences in the classroom to produce learning approaches that are vital for the functioning of the reforms that play an important part of future educational practice (Wang et al., 2010). The worksheets showed that the students had been effectively engaged in each stage of their lessons. They had all been able to use the 'K' column to identify their personal knowledge base. Moreover, they had all been able to use the 'W' column to indicate the knowledge that they wanted to learn. That their lists differed in the content of this column, indicated the ability of the K-W-L Chart to meet the specific learning needs of each individual. That the entries made by the students in the 'L' column showed the same type of individuality, highlighted the capacity for the K-W-L Chart to be used at the same time for students with a range of academic abilities and a variety of learning styles. Together, the students' comments and their worksheets clearly underscore the significant contribution that this study makes to the understanding of student-centered teaching practices, particularly through the use of interactive teaching tools such as the K-W-L Chart. They support the argument put forward by El-Sabban (2008), that student-centered teaching through interactive tools produce higher levels of student interest and motivation. They also support the call by Mitakidou and Tamoutseli (2011) for teachers to be trained to use interactive learning strategies.

**Conclusion**

Teachers in Kuwait, like teachers in the USA, are constantly challenged by the need to keep abreast with current reforms in education, in terms of content, standards, and methods, whilst retaining the cultural uniqueness of their students. As in the USA also, the current concern in Kuwait is the PD of teachers toward student-centered and interactive practices that would enable them to become facilitators and motivators of learning and empower their students to have greater control over their own learning. As part of this shift toward student-centered learning, is the need for Kuwaiti teachers to adopt teaching tools that will promote this new teaching/learning process. The K-W-L Chart is one such tool.

The theoretical framework for this study assumed a direct link between the K-W-L Chart and cognitive, schema and constructivist theories. It identified prior knowledge as a primary influence on learning and thereby confirmed the usefulness of the 'K' column in the K-W-L Chart. The literature reviewed, also highlighted the influence that prior knowledge can have on the learner's desire for new information when considered relevant to the student's personal life-experiences and thereby also confirmed the usefulness of the 'W' column of the K-W-L Chart. Of primary importance to the development of student–centered learning, as revealed through the literature review, was the finding that the interaction between learners and their environments promotes their incentive for learning and facilitates personal learning strategies. This again confirmed the potential for K-W-L Charts to facilitate student-centered learning by linking prior knowledge and the need for new knowledge to their own life contexts. The literature reviewed for this article also confirmed the potential for K-W-L Charts to promote positive changes in students' attitudes and levels of enthusiasm during the learning process.

This research study was designed to evaluate K-W-L Charts in terms of their influence on the teacher's approach, preparation, and delivery of their lessons, and the student's motivation, class participation, learning strategies, and learning outcomes. It was also designed to identify the teachers' perceptions of strengths and limitations of the K-W-L Chart in the context of the Kuwaiti FCS curriculum area. Data were collected at five different stages of the study: (a) before the PD; (b) after the PD program but before the teaching event; (c) during each classroom lesson; (d) immediately following each lesson; and (e) after all lessons had been conducted. To ensure unbiased reporting and interpretation, data was collected from the perspectives of the researcher, the participant teachers and students, and from the evidence of the student worksheets. To maximize the contextualization of this study, all written and spoken elements were conducted in Arabic and all observations and analyses were carried out by Kuwaiti nationals. The study was conducted over a four-week period commencing in November 2010.

The teacher-participants in this study were selected from 192 respondents who initially completed the questionnaire. Priority was given to teachers with the most teaching experience, with specific experience with teaching Grade 6 FCS, interest to attend a PD program and knowledge about potential reform strategies, but no prior firsthand experience with K-W-L Charts. Four female teachers and their classes were selected to participate in this research. Two students from each class were selected at random to participate in the interview and worksheet analysis portions of this study.

The findings of this study confirmed the expectation for student-centered teaching strategies and cooperative student group-work to promote student interest, motivation and lesson involvement. They also confirmed the expectation for interactive visual aids to have a positive impact on teaching and learning. The findings affirmed the ability of PD programs to change in

16

the teachers' understanding of K-W-L Charts and to promote teacher-confidence and competence in integrating K-W-L Charts into their lesson preparation, classroom strategies, and student activities. All teachers acknowledged the ability of the 'K' column to encourage students to disclose their current knowledge base and personal experiences with the lesson topic. They also acknowledge the impact the 'K' column had on facilitating peer-discussions and refining any erroneous knowledge about the topic. The research findings highlighted the influence that the 'W' column had on empowering learners to direct and generate their own learning and to promote an environment in which higher level of critical thinking could take place. Concerning the 'L' column in the K-W-L Chart, there was unanimous agreement among teachers and students, about its ability to provide space to identify and evaluate what had been learned and to provide direction and impetus for future learning. An analysis of the students' worksheets confirmed the impact that the K-W-L Chart had had on the students' ability to reflect on what they already knew, to identify new directions in learning and to learn from the interactive peer-discussions within the lesson.

Overall, the findings of the research showed that K-W-L Charts influenced the teacher's approach and preparation and delivery of the lesson by promoting deeper critical thinking about the topic, more detailed planning for student activities during the lesson, and a specific focus on the involvement of individual students rather than on the 'giving out' of information. The findings also showed that the use of the K-W-L Charts in the lesson had positively influenced the students' motivation and class participation by empowering them to contribute their personal opinions and give direction to the lesson. The K-W-L Chart also had a positive impact on their learning outcomes, in terms of short-term recall, self-assessment, and as a directive for future learning. The primary strengths of K-W-L Charts revealed in this study were their ability to direct and focus the teachers' planning, promote student interest, and encourage student involvement. The primary limitation of K-W-L Charts revealed in this study was the stress they place on time management.

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**Citation**

# Promoting Collaboration between Family and Consumer Sciences Teachers and Cooperative Extension Home Economics County Agents: Results of a Pilot Study

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*Although collaboration activities between Family and Consumer Sciences (FCS) teachers and Cooperative Extension Service Home Economics (CES-HE) county agents have not been studied, collaboration appears logical given commonalities. FCS teachers and CES-HE county agents were invited to meetings designed to promote collaboration. Pre-surveys were administered to assess current collaborative efforts, opinions about collaboration, and factors impacting collaboration. Results from the pre-surveys revealed that FCS teachers were not collaborating with their CES-HE colleagues. Post-surveys determined that the meetings had altered FCS teachers' opinions about the need for collaboration, factors impacting collaboration, and the success of the workshop. Results indicated that FCS teachers, given the opportunity to network with their colleagues, held more favorable opinions about increasing collaboration with CES-HE county agents.*

Family and Consumer Sciences (FCS) teachers and Cooperative Extension Service Home Economics (CES-HE) county agents share a body of knowledge, philosophy, history, values, and interests. In many universities, FCS teachers and CES-HE county agents follow similar curricula, and many CES-HE county agents hold FCS teacher certification. The career paths are fluid, with people often holding FCS teaching positions and CES-HE county agent positions during their careers. Content information is provided in the areas of nutrition, personal and family financial management, clothing, food safety, child development, and parenting by both groups, with the primary differences occurring in the educational setting and the ages of audiences.

If FCS teachers and CES-HE county agents provide similar content to similar audiences in counties across the nation, collaboration would be assumed, especially in times of scarce resources. Collaboration between the two groups would allow effectiveness to increase through use of synergy to develop new ideas, share expertise and resources, and create solutions to old and new problems.

## Review of Literature

Collaboration means working together in ways that exchange mutual benefit (Erickson, 1989). Goulet, Krentz, & Christiansen (2001) defined collaboration as people working together towards a common purpose, but others have argued that collaboration requires some kind of transformation in the participants beyond that of simply sharing work (Clark, et al., 1996). Although dialogue is seen as the center point of collaboration, a necessary requirement for successful collaboration includes an understanding by each participant of the work of the others (Clark, et al., 1996). John-Steiner, Weber and Minnis (1998) reported that true collaboration

required people to have "complementary domains of expertise" where all share expertise, power, and talent; no one group dominates, but all contribute within the focus of their shared spheres of work.

When one considers FCS teachers and CES-HE county agents as potential collaborators, all the appropriate requirements to successful collaboration appear to be met. FCS teachers and CES-HE county agents understand the work of the other, have complementary domains of expertise, and each would allow members to contribute in their separate but connected spheres of work. However, a review of the literature failed to discover any studies on collaboration between FCS teachers and CES-HE county agents; a study of agriculture teachers and CES county agents indicated a lack of collaboration between those two groups of similar professionals (Grage, Ricketts, & Place, 2004).

Collaboration between FCS teachers and CES-HE county agents would appear to benefit each group. Certainly the necessity to explain one's work would be eliminated as these two groups would find in each other kindred spirits who understand issues specific to their professions. Teachers have reported feelings of isolation, especially when they are the only FCS professional in a school, as frequently occurs (Bull & Cummings, 2002). Feelings of isolation, coupled with an inability to collaborate with other professionals in similar roles, can result in people who are frustrated, exhausted, and discouraged (Dodor, Sira, & Hausafus, 2010). Carroll (2004) reported that feelings of isolation caused teachers to leave the profession and suggested that collaboration with colleagues would alleviate some of the stresses associated with the profession and lead to an improvement in teacher retention. Cookson (2005) reported that teachers have difficulty collaborating due to professional restrictions, such as overly rigid schedules or unavailability of other professionals. Although authors (Heider, 2005; Hirsch, Koppick, & Knapp, 2001) have suggested mentoring as a way to reduce isolation, collaboration has been less often mentioned.

## Purpose of Study

The first goal of the study was to assess the degree to which collaboration occurred between FCS teachers and CES-HE county agents in subject matter content areas and specific FCS activities prior to the workshops. A second goal was to compare the FCS teachers' opinions about collaboration with CES-HE county agents before and after the workshops. A third goal was to compare pre- and post- workshop data regarding factors FCS teachers perceived to impact their collaboration with CES-HE county agents. The fourth goal was to determine the effectiveness of the workshop format.

## Method

### Proposal and Funding

In December of 2008, the FCS Education and Family Resource Management Advisory Council in the Departments of FCS and Extension Home Economics at New Mexico State University (NMSU), the land-grant university, raised a concern about the level of collaboration, interaction, and resource sharing that existed between FCS teachers and CES-HE county agents. The Council asked for a commitment from university faculty to develop a program to increase collaboration between the two groups. The researchers developed an implementation plan and budget, and presented the plan to the College of Agricultural, Consumer and Environmental Sciences (ACES) administrators at NMSU, who approved the plan and provided financial

support. Upon approval, the researchers developed the specific format for the two workshops held in 2010 and the instruments to be used for the pre-and post-workshop assessments.

**Participants**

The two highest populated regions in New Mexico (NM) were selected for the pilot meetings: the two counties surrounding Las Cruces, NM, and the three counties surrounding Albuquerque, NM. All middle and secondary FCS teachers, CES-HE county agents, and Advisory Council members in the two regions were mailed invitations. In addition, state-level FCS Extension specialists and college administrators were invited. The mailed invitations were followed up by email reminders. Invitations were also distributed to other FCS professionals through an email sent using the professional organization listserv.

Twenty-three participants attended the meeting in Las Cruces including Associate Deans from the College of ACES at NMSU; CES-FCS specialists from NMSU; a CES-HE county agent; Advisory Council members; FCS teachers from Doña Ana and Otero Counties; the Director of the Graduation, Reality, and Dual Skills (GRADS) program in NM; and the four researchers. The meeting in Albuquerque had 27 attendees, including the CES Northern District Department Head; CES-HE county agents; a CES-HE 4-H/Extension associate; a CES-FCS diabetes coordinator; a CES-FCS specialist from NMSU; Advisory Council members; FCS teachers; a representative from the New Mexico Association of Family and Consumer Sciences; a representative from the Hotel, Restaurant and Tourism Management program at NMSU; and the four researchers. A total of 25 FCS teachers attended the two workshops.

**Meeting Format**

Each meeting provided opportunities for like-minded professionals to come together with the time and opportunity to talk, share information about their own programs, network, and discuss ways to work together in collaborative efforts. The half-day meetings on Saturdays started at 9 a.m. in the Extension offices with coffee and refreshments. Participants were asked to complete pre-surveys before the meetings began. The meetings were planned to run until noon. Although some of the participants knew each other, many others did not and were meeting for the first time.

The meetings began with introductions, followed by presentations by NMSU ACES administrators. FCS teachers were asked to present an overview of the resources and strengths in their individual programs. Following the teachers, the CES-HE county agents presented the programs and resources that they felt might be appropriate for FCS teachers' classrooms and activities. After the informal presentations, FCS teachers and CES-HE county agents were divided into groups based on their geographical locations and allowed to get acquainted, network, and plan for future collaboration. Just before the end of the allotted time, lunch was provided and participants were asked to complete a post-survey.

**Instruments**

Three instruments were developed by the researchers: a pre-workshop survey, a post-workshop survey, and a Level One workshop evaluation. All approvals were obtained from the university Institutional Review Board for the collection of data and the protection of human subjects. The pre- and post-survey instruments were similar with the pre-survey asking additional questions about existing collaboration with CES-HE county agents. The collaboration assessment instruments consisted of a combination of Likert scales and check-off formats to determine content areas and types of activities where collaboration existed, opinions about

collaboration, and factors impacting collaboration efforts. The Level One evaluation used a Likert format. Subjects elected to participate, and no perceived risk was associated with participation or non-participation.

The pre-workshop survey asked participants to indicate levels of collaboration that existed between FCS teachers and CES-HE county agents in their settings in content areas such as *health and wellness* and *family relationships*, and FCS-related activities such as *service projects* and *FCCLA*. Possible responses ranged from *almost always* to *almost never* on the five-point Likert scale. The survey also asked participants to respond to opinion statements such as "*Current collaboration efforts between FCS teachers and county agents are at an ideal level*" and "*FCS teachers need to increase county agent involvement in schools and school projects*" by selecting *strongly agree* to *strongly disagree* responses on a five-point Likert scale. The survey contained a check-all-that-apply section of factors impacting collaboration with items such as "*We have similar areas of interest*" and "*Collaboration is worth my time commitment*."

## Statistical Analysis

For comparing pre- and post-survey results of FCS teachers, the researchers used different procedures depending on the nature of the responses and data, while taking into account that the respondents in the two surveys are dependent (i.e. the same sample). The analyses were conducted using SAS, version 9.3.

For the five-point Likert-scale items, the researchers used the Wilcoxon signed rank test, since the test assumes an ordinal score for each comparison item without the normal distribution assumption (Coussement, Demoulin, & Charry, 2011). For "*select any that may apply*" items, the researchers opted for McNemar's test to test for differences in response tendencies of teacher before versus after the collaboration meeting (Coussement, et al., 2011). Since test statistics were not computed when at least one of the four cells (2 x 2) had less than two observations, the researchers used the Wilcoxon signed rank test for such analyses. P-values obtained from both McNemar's and Wilcoxon signed rank tests were identical whenever items could be analyzed using both statistics. Since the sample size was small, the level of significance was set at a lower probability (p$\leq$ 0.10) (Rubin & Cole, 2009; Noymer, 2008).

## Results

### Response Rate

A total of 25 FCS teachers attended the two workshops. Twenty-two FCS teachers completed both pre- and post-surveys for a response rate of 88%.

### Pre-Workshop Levels of Collaboration

FCS teachers were asked to report the current level of collaboration that existed between CES-HE county agents and themselves in the pre-workshop survey. Results of collaboration on subject matter content areas are reported in Table 1. Results of collaboration on activities are reported in Table 2. FCS teachers generally reported that they *almost never* collaborated with their CES-HE colleagues. In the content areas, 75 percent or more of the teachers indicated they *almost never* collaborated with their CES-HE colleagues for seven of the nine content areas. While collaboration between CES-HE county agents and FCS teachers appeared more prevalent in activities, more than 50 percent of the teachers reported they *almost never* collaborated in the nine activities listed on the survey.

Table 1

*Pre-Workshop Levels of Collaboration with CES-HE County Agents in Content Areas as Reported by FCS Teachers (N=22)*

| Content Area | Almost Always (%) | Usually (%) | Sometimes (%) | Rarely (%) | Almost Never(%) |
|---|---|---|---|---|---|
| Housing and Design | 0.0 | 5.0 | 5.0 | 5.0 | 85.0 |
| Clothing, Fashion, and Textiles | 0.0 | 4.8 | 9.5 | 4.8 | 81.0 |
| Family Resource Management | 5.0 | 0.0 | 5.0 | 10.0 | 80.0 |
| Disaster Preparedness | 5.0 | 0.0 | 10.0 | 5.0 | 80.0 |
| Child Development | 0.0 | 10.0 | 10.0 | 0.0 | 80.0 |
| Food Technology | 0.0 | 10.0 | 10.0 | 5.0 | 75.0 |
| Family Relationships | 0.0 | 5.0 | 20.0 | 0.0 | 75.0 |
| Health and Wellness | 5.0 | 15.0 | 20.0 | 0.0 | 60.0 |
| Food and Nutrition | 10.0 | 15.0 | 20.0 | 10.0 | 45.0 |

Table 2

*Pre-Workshop Levels of Collaboration with CES-HE County Agents in Activities as Reported by FCS Teachers (N=22)*

| Activity | Almost Always (%) | Usually (%) | Sometimes (%) | Rarely (%) | Almost Never(%) |
|---|---|---|---|---|---|
| 4-H Events | 0.0 | 5.0 | 15.0 | 5.0 | 75.0 |
| County Fairs | 0.0 | 9.5 | 4.8 | 14.3 | 71.4 |
| Service Projects | 0.0 | 9.5 | 9.5 | 14.3 | 66.7 |
| Professional Trainings | 0.0 | 9.5 | 19.0 | 9.5 | 61.9 |
| FCCLA Events | 4.8 | 19.0 | 9.5 | 4.8 | 61.9 |
| Presentations | 0.0 | 15.0 | 20.0 | 5.0 | 60.0 |
| Subject Matter Content Sharing | 4.8 | 9.5 | 23.8 | 4.8 | 57.1 |
| Newsletter Articles | 5.0 | 5.0 | 10.0 | 25.0 | 55.0 |
| Material Resource Sharing | 9.5 | 4.8 | 9.5 | 23.8 | 52.4 |

**Comparisons of Pre- and Post-Workshop Opinions on Collaboration**

Opinions held by FCS teachers concerning collaboration with CES-HE agents prior to the workshops were compared to their opinions after the workshops. These data are presented in Table 3. For all the eight statements, larger percentages of teachers indicated stronger agreement tendencies on the post-workshop survey. For three of the items, significant changes were found.

- For item 1, 35 percent of the teachers *strongly agreed* that county agents are very important to FCS teachers at the pre-workshop time, while 50 percent *strongly agreed* at post-workshop (p=0.065). For the same statement, 25 percent of the teachers reported before the workshop that they were *neutral* about CES-HE county agents' importance to FCS teachers. Post-workshop, the neutral opinion concerning CES-HE county agents' importance to FCS teachers had dropped to 4.5%.
- For item 4, all the teachers (100%) *agreed* or *strongly agreed* that county agents involvement in schools should be increased at the pre- and post-assessments. Teachers moved toward stronger agreement after the workshop (p=0.065).
- For item 8, 4.5 percent of teachers disagreed with the statement that they should cooperate with county agents on regular basis at the pre-workshop assessment, while 13.6 percent of the teachers were neutral about cooperating with CES-HE county agents. At the end of the workshop, all the teachers (100%) *agreed* or *strongly agreed* that CES-HE county agents and FCS teachers should cooperate on regular basis (p=0.0547).

Table 3
*FCS Teachers' Opinions Regarding Collaboration with CES-HE County Agents in Pre-and Post-Workshop Surveys (N= 22)*

| Statement | Pre (%) | | | | | Post (%) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
| 1. County agents are very important to FCS teachers (p=0.0649) | 35.0 | 35.0 | 25.0 | 0.0 | 5.0 | 50.0 | 45.5 | 4.5 | 0.0 | 0.0 |
| 2. Current collaboration efforts between FCS teachers and county agents are at an ideal level (p=0.3331) | 0.0 | 15.0 | 35.0 | 20.0 | 30.0 | 9.5 | 23.8 | 23.8 | 23.8 | 19.0 |
| 3. Current collaboration efforts between FCS teachers and county agents need to be increased (p=0.7813) | 50.0 | 45.0 | 5.0 | 0.0 | 0.0 | 61.9 | 28.6 | 9.5 | 0.0 | 0.0 |
| 4. FCS teachers need to increase county agent involvement in schools and school projects (p=0.0654) | 47.6 | 52.4 | 0.0 | 0.0 | 0.0 | 77.3 | 22.7 | 0.0 | 0.0 | 0.0 |

| Statement | Pre (%) | | | | | Post (%) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
| 5. County agents need to increase FCS teacher involvement in Extension programming (p=0.1875) | 60.0 | 30.0 | 10.0 | 0.0 | 0.0 | 72.7 | 27.3 | 0.0 | 0.0 | 0.0 |
| 6. County agents can significantly add value to FCS teacher effectiveness (p=0.2891) | 63.6 | 36.4 | 0.0 | 0.0 | 0.0 | 81.8 | 18.2 | 0.0 | 0.0 | 0.0 |
| 7. FCS teachers can significantly add value to county agent effectiveness (p=0.4316) | 52.4 | 33.3 | 9.5 | 4.8 | 0.0 | 59.1 | 36.4 | 4.5 | 0.0 | 0.0 |
| 8. County agents and FCS teachers should cooperate on a regular basis (p=0.0547) | 50.0 | 31.8 | 13.6 | 4.5 | 0.0 | 68.2 | 31.8 | 0.0 | 0.0 | 0.0 |

**Comparisons of Pre- and Post-Workshop Factors Impacting Collaboration**

At pre- and post-survey times, FCS teachers were provided a list of 22 factors that might impact their collaboration efforts with CES-HE county agents. From the list, the teachers were asked to check off the factors that they felt might impact their attempts to collaborate. In Table 4, the six factors that showed at least a 20 percent increase from the pre- to post-workshop assessments are presented. From pre- to post-assessment times, a significant difference was found for one factor, "*we have similar areas of interest*" at the $p=\leq. 05$ level. Five differences between pre- and post-workshop factors achieved significance at the $p=\leq. 10$ level.

Table 4
*Factors Perceived to Impact Collaboration with CES-HE County Agents as Reported by FCS Teachers in Pre- and Post-Workshop Surveys (N=22)*

| Factors Impacting Collaboration | Pre (%) | Post (%) |
|---|---|---|
| We have similar areas of interest. (p=0.0313) | 68.2 | 95.5 |
| Collaboration is worth my time commitment. (p=0.0625) | 76.2 | 100.0 |
| Geographical location is conducive to our collaboration. (p=0.0625) | 63.6 | 86.4 |
| They need my expertise. (p=0.0625) | 45.5 | 68.2 |
| We have a working relationship. (p=0.0625) | 27.3 | 50.0 |
| Arranging for collaboration is difficult. (p=0.0625) | 13.6 | 36.4 |

The top five factors that FCS teachers felt impacted the level of collaboration between themselves and their CES-HE colleagues at the conclusion of the workshop were as follows:

*Collaboration is worth my item commitment* (100% of teachers chose this factor*); I need the expertise offered* (100% of teachers selected this factor); *We have similar areas of interest* (95.5% of teachers chose this factor); *Collaboration enhances my perceived competency* (95.5% of teachers chose this factor); *Geographical location is conducive to our collaboration* (86.4% of teachers chose this factor).

**Evaluation of Workshops**

All workshop participants were given the opportunity to evaluate the workshop format using a Likert scale with responses ranging from *strongly agree* to *strongly disagree*. Reactions to the meetings, presented in Table 5, were extremely favorable with scores in the 4.4-4.8 range (out of a possible 5) for 7 of 9 statements. The two statements receiving lower scores (in the 3.77-3.83 range) dealt with the need for additional time for individual input and collaboration planning.

Table 5
*Mean Scores on Level One Evaluation for Workshop Format (N=31)*

| Statement | Mean Score |
|---|---|
| The meeting was well organized. | 4.74 |
| Food/refreshments were appropriate. | 4.74 |
| The meeting was helpful and I was able to develop contacts. | 4.67 |
| The meeting was held at an appropriate time. | 4.65 |
| The facility was appropriate for the meeting. | 4.53 |
| The date for the meeting was convenient. | 4.45 |
| The meeting met my needs for information. | 4.45 |
| Enough time for collaboration was provided. | 3.83 |
| Enough time was provided for individual input. | 3.77 |

**Discussion**

The first goal of the study was to assess the degree to which collaboration occurred between FCS teachers and CES-HE county agents in content areas and FCS activities prior to the workshops. As Advisory Council members suspected, collaboration was not occurring between FCS teachers and CES-HE county agents. A majority of the FCS teachers reported that they almost never collaborated with their CES-HE colleagues in FCS content areas and FCS-related activities. Although the FCS and CES-HE county agents are similar professionals who meet the requirements for successful collaboration (Clark, et al., 1996), the lack of collaboration reflects the findings of a study between agriculture teachers and CES agents, which reported little collaboration (Grage et al., 2004.)

The second goal of the research was to compare the FCS teachers' opinions about collaboration with CES-HE county agents before and after the workshops. Getting the two groups together clearly resulted in positive changes in FCS teachers' opinions about possible collaboration with CES-HE county agents and perhaps will lead to increased future collaboration. The literature reported the feelings of isolation, frustration, exhaustion, and discouragement associated with the inability to collaborate with other professionals in similar roles (Bull & Cummings, 2002; Dodor et al., 2010). Having the two groups meet and network reminded FCS teachers of the availability of their CES-HE colleagues, many of whom are located in the same county.

Although FCS teachers reported that they felt CES-HE colleagues were important to them before the workshop, the post-workshop data showed a marked change in the degree to which the FCS teachers felt the importance of the CES-HE county agents. One-fourth of FCS teachers expressed a neutral opinion about CES-HE county agents' importance prior to the workshop. After the workshop reminded the teachers of their connections with CES-HE county agents, the neutral opinion response dropped substantially in the post-workshop survey. The ability to network and discuss with the CES-HE county agents served to remind FCS teachers of their CES-HE colleagues and the possibility of collaboration, and may lessen the feelings of isolation that some experience.

Although almost one-half of the FCS teachers felt strongly about involving county agents in school and school projects prior to the workshop, over three-fourths of the FCS teachers responded that they strongly agreed with the need to increase CES-HE county agents' involvement with their schools and school projects after the workshop. Having other FCS professionals available for school projects may alleviate stresses associated with limited resources.

FCS teachers were also asked to respond to the statement that they should collaborate on a regular basis with their CES-HE colleagues. Although a majority of FCS teachers strongly agreed with this statement pre-workshop, some teachers were neutral or disagreed that collaboration should occur. Post-workshop results showed that all of the FCS teachers either strongly agreed or agreed with the need for collaboration. Certainly having the time and face-to-face contact with CES-HE colleagues resulted in an increased desire for collaboration.

The third goal of the research was to compare pre- and post- workshop factors FCS teachers perceived to impact their collaboration with CES-HE county agents. While the workshops allowed FCS teachers to reconnect with their CES-HE colleagues and reminded them of their shared expertise and potential value to each other, they also showed an increased awareness of the difficulty in scheduling collaboration, noted by Cookson (2005).

The fourth goal of the research was to determine the effectiveness of the workshop format. The participants thought the meeting was well organized, helpful, and provided needed information. Bringing FCS teachers and CES-HE county agents together to talk about collaboration did appear to meet the overall goals of the workshops. Statements receiving lower scores on the evaluation concerned the time allotted for individual input and collaboration planning. However, the researchers felt that increasing hours on a weekend would discourage participation.

**Implications for FCS Educators and Researchers**

FCS teacher educators should organize efforts to promote collaboration between FCS teachers and CES-HE county agents through workshops similar to this pilot study. Pre-service FCS teachers and CES-HE agents should be provided with opportunities during university coursework to develop skills in collaboration and networking. FCS teacher educators should educate university administrators, school administrators, school district career and technical educational directors, and Extension personnel about the advantages of FCS teachers' collaboration with CES-HE county agents. Teachers can collaborate using their extensive education and experience, and the CES-HE county agents can help teachers with the most current research-based knowledge and skills.

The researchers suggest the meeting format utilized in this study will be helpful to promote collaboration between these two groups; findings indicate that given the opportunity,

FCS teachers do want to collaborate with their CES-HE colleagues. However, participants in these meetings wished for additional time in the workshops to talk about collaboration. Such meetings might be held in school settings as well as county Extension offices. Since lack of time and the difficulty in arranging for collaboration appear to be factors in the meetings conducted in this study, future meetings might be longer and held more frequently to allow for continuity in planning and implementation of collaboration efforts.

Academic faculty at land-grant universities and non-land-grant universities need to support collaboration efforts by providing their expertise for professional training, material resource sharing, and presentation content and strategies. Land-grant universities could sponsor collaboration workshops, meetings, and seminars for FCS teachers and CES-HE county agents. FCS teachers and CES-HE county agents need to be encouraged and provided funding by their administrators to attend each other's professional meetings to network and develop opportunities for collaboration.

Additional research is needed on collaboration efforts between FCS teachers and CES-HE county agents. Issues that need to be explored are the degree of collaboration that currently exists across the United States, benefits of collaboration, differences in collaboration between urban and rural settings, and factors affecting the levels of collaboration. Longitudinal studies should track results from efforts to increase collaboration between FCS teachers and CES-HE county agents.

**Conclusion**

The purpose of this pilot program was to determine the benefit of bringing together people who have complementary domains of expertise and allowing them to determine what their shared spheres of work might become. The researchers planned the workshop format to determine if collaboration was occurring and to allow participants to network and talk about their programs, needs, and sharable expertise and resources. Results clearly indicated that collaboration was lacking. The FCS teachers left the workshops with a renewed understanding and appreciation of the connectedness between themselves and the CES-HE county agents. After the meeting, FCS teachers saw that CES-HE county agents were very important and collaboration should increase. Collaboration efforts were discussed, and connections were made.

Teachers also changed their opinions about the involvement of county agents in schools and school projects. Many times, an FCS teacher might be the only FCS professional in his/her school. Reminding the teachers of their potential connections with CES-HE county agents might alleviate some of the feelings of isolation and the lack of mentoring support that FCS teachers report (Jalongo & Heider, 2006). The feelings of frustration, exhaustion, and discouragement that teachers reported might be lessened by having another professional locally who understands the work that one does (Dodor et al., 2010).

The outcome of the workshop may have allowed FSC teachers and CES-HE county agents to create new ways to think about collaboration within their complementary domains of expertise, including new and different ways of sharing their work spheres and helping each with the mission of the other. Additional collaboration workshops such as this one would allow FCS teachers and CES-HE county agents to develop relationships to strengthen their resources and broaden their spheres of influence.

Cookson (2005) reported that professional collaboration for teachers was difficult because of their isolation in their classrooms and overly rigid schedules. This study pointed to that difficulty as well. FCS teacher educators and university administrators could develop

possible avenues for teachers and county agents to collaborate in this restrictive environment, including the increased use of technology, such as electronic bulletin boards, social media, and other online meeting venues. Utilizing collaboration with CES-HE county agents would allow FCS teachers to join a larger community of FCS professionals and increase their participation in the FCS community.

The FCS teachers and CES-HE county agents came together to share programs and successes, inform each other about resources, and strategize for collaboration efforts. Discussions focused on FCS school program updates, county FCS Extension programs, and state FCS specialists' areas of emphasis. The meetings improved dialogue between FCS teachers and CES-HE county agents at the county levels and emphasized the contributions, expertise, and resources each could make to the others' programs. The workshops increased FCS teachers' ability to collaborate with like-minded colleagues in their geographical area.

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## Citation

# Problems Encountered by Beginning
# Family and Consumer Sciences Teachers

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*The purpose of this study was to describe problems faced by beginning family and consumer sciences (FACS) teachers in Illinois. Ninety (59%) Illinois FACS teachers who taught four or fewer years responded to the online questionnaire. Qualitative analysis revealed four themes: student management, facility management, instruction management, and external relations. Each theme contained subthemes; the predominant subtheme was student discipline and classroom management. Implications for teacher education programs and professional development are discussed.*

Meeting the needs for family and consumer sciences (FACS) teachers is of great concern to the profession. A deficit of available certified secondary FACS teachers has been a persistent problem over the past two decades (Jackman & Rehm, 1994; Miller & Meszaros, 1996; Mimbs, 2002; 2000; Tripp, 2006). While the FACS teaching profession continues to experience a shortage, it is essential to retain as many current teachers as possible. In fact, Mimbs (2002) recommended that more efforts need to be made to keep practicing FACS teachers in the classroom as a remedy to the shortage.

The largest population of teachers to leave the profession is beginning teachers (Lambert, 2006; Tamberg, 2007). Many new teachers leave the profession because of problems faced in their teaching assignment (Boone & Boone, 2007; U.S. Department of Education, 2002). Previous FACS retention studies have focused on veteran teachers and those no longer teaching, but little evidence exists about concerns of beginning FACS teachers that may result in leaving the classroom. Therefore, the purpose of this study was to describe problems faced by beginning family and consumer sciences teachers in Illinois. An understanding of problems facing beginning FACS teachers is a critical first step for FACS professionals and school administrators seeking to improve the retention rates of novice FACS teachers and find solutions to the teacher shortage plaguing the FACS profession.

## Teacher Attrition

Teaching in career and technical education (CTE), of which FACS is a service area, is a rigorous yet frequently underrated challenge (Cushall, 2002). This is evidenced by the attrition rates of beginning teachers. Nearly 25% of new teachers leave the profession within the first three years and 50 – 60% of new teachers resign within the first five years (Lambert, 2006; Tamberg, 2007). Osgood (2001) referred to the induction phase as the most critical facet related to remaining or exiting the profession.

Teaching is one of the few professions in which beginning teachers have as much responsibility as their experienced colleagues (Tait, 2008). Huberman (1993) proposed that the first three years are a time of beginnings and teachers feeling their way as new professionals. However, beginning teachers are expected to perform at the level of veteran teachers. Novice teachers experience a reality shock when confronted with the demands of teaching, and as a result feel ineffective and overwhelmed (Bennett, Iverson, Rohs, Langone, & Edwards, 2002).

Croasmun, Hampton, and Herrmannn (1999) cited one reason so many new teachers leave was that the [teaching] profession has been slow to develop a systematic way to induct beginners gradually into the complexities of a job that demands hundreds of management decisions every day.  Research focused on the beginning teacher experience found copious evidence to show that the transition from educational student to a professional teacher is often a difficult and stressful experience and one that is frequently associated with an early exit from the profession (Kelchtermans & Ballet, 2002; Schonfeld, 2001).

Teacher attrition has been linked to a multitude of problems faced by beginning teachers in their teaching assignment (Boone & Boone, 2007).  Veenman (1984) conducted a thorough examination of educational research and identified 91 studies that involved early career teacher concerns.  Within these studies, the most frequently reported problems for beginning teachers were classroom management and discipline, motivating students, insufficient supplies, insufficient preparation time due to high teaching loads, and relationships with colleagues.  Poor or lack of administrative support was identified as a key problem by many leaving the profession (Boone & Boone, 2007; Fox & Certo, 1999; Self, 2001).  Other problems included: time management (Heath-Camp, Camp, Adams-Casmus, Talbert, & Barber, 1992; Steinke & Putnam, 2007); facilities and equipment (Boone & Boone, 2007; Heath-Camp et al., 1992; Stair, Warner, & Moore, 2010); working with special populations (Farrington, 1980; Zirkle & Winegardner, 2007); budgets and funding (Boone & Boone, 2007; Stair et al., 2010); salaries (Ingersoll, 2003; Self, 2001); and curriculum development (Myers, Dyer, & Washburn, 2005).  While the problems identified are true for beginning teachers we are uncertain if they are true for beginning FACS teachers.

Particular to beginning FACS teachers, Nichols and Mundt (1996) found that classroom control and facility management (e.g., equipment and budget) were the most important competencies necessary for surviving the first years of teaching.  Other problems concerning FACS teachers have been identified through previous satisfaction and retention studies (Bartley & Sneed, 2004; Mimbs, 2000; Tripp, 2006).  Researchers found tasks associated with negative perceptions of the job among FACS teachers were (a) contemporary job-related responsibilities including standardized testing, meetings, and added paperwork; (b) negative image of FACS teachers/curriculum; (c) loss of program integrity; (d) student-characteristics including discipline and affiliation with special education programs; and (e) support from building and district-level administrators and personnel (e.g., teachers, guidance counselors) (Erwin, Moran, & McInnis, 1996; Fedje, 1999, Mimbs, 2002; 2000; Stout, Couch, & Fowler, 1998).  The focus of these studies was on veteran teachers or those no longer teaching; whether beginning FACS teachers experience the same problems is not known.

Induction programs have been used as a strategy to support and mentor beginning teachers.  While many induction issues for beginning teachers are similar across disciplines, it can be debated that there are unique elements associated with being a career and technical education (CTE) teacher (which FACS is a part of) that may require different mentoring strategies (Greimann, Torres, Burris, & Kitchel, 2007).  In fact, research has been cited that often induction programs are not responsive to the unique needs of CTE teachers and provides even a more marginal focus for that of beginning FACS teachers (Croasum et al., 1999; Lynch, 1998; Huling-Austin, 1986).

## Theoretical Framework

Career satisfaction has been a determinant of a teacher's decision to remain or leave the profession (Lee, Clery, & Presley, 2001; Ubom & Joshua, 2004). Previous research indicated novice teachers expressed strong dissatisfaction as the primary reason they left their jobs due to problems within their teaching assignment (Voke, 2002). Self (2001) suggested that teachers resolve the question of whether to remain in education through "satisficing" rather than through optimizing. The level of satisfaction is the rationale basis for a teacher leaving as opposed to trying to improve the situation.

The theoretical framework that has guided research related to job satisfaction primarily focused on intrinsic and extrinsic factors (Mottaz & Potts, 1986). Garton and Robinson (2006) stated that the Motivation-Hygiene Theory centered on intrinsic and extrinsic factors could explain why teachers identify with certain employability skills needed and why they leave their positions.

Herzberg (1966) developed the Two-Factor Theory of Job Satisfaction also known as the Motivation-Hygiene Theory. The central tenant of this theory was that job satisfaction and job dissatisfaction were influenced by two substantially different sets of work-related factors termed *motivator* and *hygiene*. Motivators are intrinsic factors of work while hygiene (maintenance) factors refer to extrinsic factors. Table 1 illustrates some of the motivation (intrinsic) and hygiene (extrinsic) factors that were reported to influence job satisfaction or dissatisfaction among teachers.

Table 1

*Motivation-Hygiene Theory: Examples of Influential Motivator and Hygiene Factors in Education*

| Motivation Factors | Hygiene Factors |
| --- | --- |
| achievement | job instability |
| advancement | negative supervision |
| characteristics | poor collegial relationships |
| growth | poor policies and/or procedures |
| recognition | inadequate compensation |
| responsibility | poor social status |

The Motivation-Hygiene theory operates on two mutually exclusive continuums. The job satisfaction continuum is impacted by motivator (intrinsic) factors and varies from a level of satisfaction to a level of no satisfaction. On the other hand, the job dissatisfaction continuum is impacted by hygiene (extrinsic) factors and operates from a level of dissatisfaction to a level of no dissatisfaction. Both the motivator and hygiene factors however may prove to facilitate negative experiences in the classroom.

As applied to this study, if beginning teachers encounter problems due to a lack of preparation and/or competency [in problem areas], they may be less likely to be engaged with their work environments, grow professionally, or continue their interest in their jobs (Myers et al., 2005). If so, as a result, it is more likely they will leave the teaching profession and seek alternative types of employment (Berns, 1990).

## Methodology

### Purpose and Objective

The purpose of this study was to describe problems faced by beginning FACS teachers in Illinois. The primary objective was to identify and categorize a list of problems encountered by FACS teachers during their first years in the education profession. The following research question provided direction for the study: what were the problems faced by beginning FACS teachers in Illinois?

### Method and Procedures

A qualitative research design was selected to examine the phenomenon in detail and allow the respondents to describe the situations in their own words (Ary, Jacobs, Razavieh, & Sorenson, 2006). A questionnaire adapted from Boone and Boone (2007) was used for this study. The questionnaire consisted of one open-ended question that asked respondents to describe two problems they encountered as beginning teachers in family and consumer sciences. The questionnaire was placed online using surveymonkey.com.

The population consisted of beginning FACS teachers employed in Illinois during the 2009-2010 school year. For the purpose of this study, beginning teachers were defined as teaching for four or fewer (based on the evaluation decision for tenure). The sampling frame was established using the state's secondary FACS teacher directory, and the entire population (N = 153) was studied.

In spring 2010, a cover letter that included the questionnaire link was emailed to every teacher in the accessible population. They were given one week to complete the questionnaire. Although the research design and data analysis were qualitative in nature, Dillman's (2007) method was used to increase the response rate. Following the one week deadline, two subsequent weekly emails were sent to remind respondents to participate in the research study. Ninety respondents (59%) completed the questionnaire.

Data analysis was divided into three stages (Avry et al., 2006). In stage one the principal investigator transcribed the data into a database. In stage two the responses were reviewed, response categories were established, and the responses were placed in the categories by the principal investigator. The principal investigator having taught FACS education for 14 years had firsthand knowledge of the problems faced in the state by beginning teachers. The questionnaire, coding rubric, and final results of the coding were presented to FACS education professional colleagues to review to establish credibility of interpretation and to ensure conformability. Following the group discussion, data were recoded to establish the reliability and validity of the process. In stage three, the data were summarized and interpreted.

## Findings

The responses to the open-ended question on problems encountered as a beginning FACS were analyzed and four themes emerged. The four themes were (a) student management, (b)

facility management, (c) instruction management, and (d) external relations.  Each theme contained individual subthemes.

The first theme was student management.  Within this theme, there were two subthemes (a) discipline/classroom management and (b) student motivation.  Discipline/classroom management was the predominant problem described by beginning FACS teachers in the study.  Examples of the responses included "how to handle behavioral problems on the spot," "classroom control," "students would test their limits making classroom management a constant struggle," "no follow through from administration when sent a student to office for discipline sanctions," and "students swearing, blatantly not following directions, talking back, and sleeping in class."

The second subtheme within the student management theme was student motivation.  Responses included "students don't seem to want to learn," "many work late or are taking substances or medication that makes them sleepy or irritable in class," "how do you motivate uninspired students?,"  "getting students to participate in class discussions," and "student apathy."

The second theme was facility management and included two subthemes (a) facilities and (b) equipment and budgeting and funding.  Responses in the facilities and equipment subtheme included "I am teaching Foods without stoves, ovens, or even sinks for everyone," "not enough equipment (sewing machines) and other supplies to go around," "broken equipment but expected to have labs," "out-of-date equipment," "traveling from classroom to classroom to teach," and "having to teach labs in a regular classroom."

Budgeting and funding was the other subtheme in the facility management theme.  Problem statements included "trying to maintain a quality culinary program with budget cuts," "how to extend the budget to allow more learning experiences,"  "how to develop a budget- I work by trial and error and hope to have enough money left by the end of the year," "last in the school to have materials replaced," and "no monies allotted for professional development."

The third theme was instruction management. Subthemes within this theme included (a) curriculum (content, lesson planning, teaching strategies), (b) multiple class preparations, (c) time management, and (d) lab management.  Responses in the curriculum subtheme included "coming up with new and interesting teaching strategies while making it fun," "how to curriculum map," "being able/expected to teach in all areas of FACS but not having prior content knowledge/experience," "only taking one foods course in college and having to teach an entire course," "no curriculum to follow," and "seeking activities that promote interdisciplinary learning."

Multiple class preparations was a subtheme within instruction management.  Respondent statements included "feeling like a jack of all trades, master of none because I had so many different courses to teach, so I feel overwhelmed with my teaching load," "planning for seven different preps," and "juggling six preps, feel overscheduled."

Time management was another subtheme within the instruction management theme.  Problem statements included "not enough time in the day to teach and do the 'business' side of this job," "balance of extracurricular responsibilities with teaching responsibilities," "not prepared to 'punt' if the lesson plan took less time than I anticipated," and "too much to do and not enough time."

The subtheme lab management was classified within the instruction management theme.  Examples of the responses included "finding a good method for setting up labs, lab rules, assign lab groups, etc.," "sharing labs with other Foods teachers and not having the same expectations

for cleanliness," "getting labs done within 42 minute periods," and "grocery shopping for labs on own time."

The fourth theme was external relations. Within this theme there were two subthemes (a) image and (b) administrative support. The most common respondent statement for the image subtheme was "our classes are 'dumping grounds' for students that have nowhere else to go." Other problem statements concerning the image included "the administration wanted me to do a cooking show for the faculty," "lack of respect among academic teachers," "coach wanted me to round up the new basketball uniforms and wash them," and "FACS is not taken seriously or valued by colleagues because courses are electives."

The other subtheme within external relations theme was administrative support. The most common problem statement in this subtheme was "lack of administrative support." Other statements included "the administration did not value my program," "lack of communication," and "favoritism with other disciplines."

## Discussion and Implications

The purpose of this study was to describe problems faced by beginning family and consumer sciences teachers (FACS) in Illinois. Qualitative results revealed four themes: student management, facility management, instruction management, and external relations. The themes contained individual subthemes. The problems described have been reported in previous studies as problems among teachers.

Within the student management theme, discipline and classroom management was the prevailing problem described by beginning FACS teachers. This finding is consistent with findings by a number of researchers including Boone and Boone, 2007; Ingersoll (2003); Mimbs (2000); Myers et al., (2005); Nichols & Mundt (1996); Self (2001); Stair et al., (2010); and Veenan (1984). As a continuous problem, it seems discipline and classroom management is not being adequately addressed within teacher preparation programs. It may be beneficial for these programs to require a course dedicated to classroom management or induction programs to provide continuous professional development on the topic. Without classroom control, instructional time is narrowed to deal with inappropriate student behavior. Wong and Wong (2009) suggested that classroom management is one of the three characteristics associated with being an effective teacher.

Respondents described facility management, which included facilities and equipment and budget and funding as a problem area. Similar results were found by Boone and Boone (2007); Heath-Camp et al., (1992); and Stair et al., (2010). Given the economic times, most schools are either being frugal or eliminating line items from the budget. Facilities and equipment cannot be improved without money in the budget so FACS teachers need to find alternative ways to teach their classes or seek external sources of money, such as grants, fundraisers, or community outreach/donations.

The theme of instruction management was a problem area described by respondents. Specifically, lab management was a problem expressed by beginning FACS teachers. This supports findings of Nichols and Mundt (1996) who reported lab organization as the second most rated competency needed among beginning FACS teachers. Although FACS has varied lab experiences (e.g., pre-k and textile), respondents indicated problems predominantly with the operation of managing a foods lab, ranging from how to group students to when to grocery shop. For beginning teachers struggling with lab management, it would be valuable to seek guidance from a FACS teacher who has had experience with foods labs. Additionally, this problem should

be communicated to the administration and a request made for an aide during labs to help monitor labs and shop. It would be beneficial for teacher education programs to dedicate course time to adequately address lab management, especially food labs.

The other subthemes within the instruction management theme included time management, multiple class preparations, and curriculum. Each of these problems has been identified in the previous studies as problems teachers encounter (Boone & Boone, 2007; Fox & Certo, 1999; Heath-Camp et al., 1992; Self, 2001; Steinke & Putnam, 2007; Veenman, 1984). Teacher education programs should consider extending the length of student teaching and have student teachers assume the full teaching load for a longer period to be prepared for the instructional responsibilities associated with teaching.

The image of FACS was a subtheme of external relations. Consistent with findings from Fedje (1999) and Mimbs (2000) image has been a persistent problem among teachers within the FACS profession. It is the responsibility of every FACS teacher to be proactive to educate and advocate for the profession. One way to be proactive is to be visible within the school and community through Family, Career, and Community Leaders of America (FCCLA) sponsored events such as participating in Crop Walk (awareness campaign to fight against hunger) or engage in service learning projects. For example, start a school garden and provide the grown produce to the school cafeteria or donate to the local food pantry or senior care facility. This visibility can be utilized as a public relations campaign to educate people about family and consumer sciences thus updating people's perception of FACS.

Applying the results to this study's theoretical framework, the problems (themes and subthemes) can be classified in both the motivator and hygiene factors categories. According to Herzberg's theory, the problems identified can be located on the negative end of the two factors' respective continuum – no satisfaction (motivator's continuum) and dissatisfaction (hygiene's continuum). That means both factor sets can contribute to poor experiences for a teacher thus decreasing their satisfaction level. A joint effort should be attempted to integrate solutions to teacher problems to shift the levels of satisfaction towards the positive ends of each factor's continuums. However, if the identified problems are not resolved, it could potentially impact teachers by withdrawing or exiting the education profession.

### Recommendations

Many teachers leave the profession because of problems they face in their teaching assignments. Those responsible for the preparation and retention of FACS teachers must then recognize problems faced by beginning FACS teacher and gain a better understanding of how to best address these problems.

The following are recommendations made based on the outcomes of this study.
1. Teacher education programs need to ensure the problems identified (e.g., classroom management) in this study are adequately being addressed within their program of study.
2. Stakeholders, including FACS university teacher education faculty, state FACS staff, FACS professional organization leaders, and veterans and novice FACS teachers could jointly develop and coordinate in-service workshops and opportunities for professional development with topics based on the problems identified from this study. Examples of topics include classroom management, lab budgeting, and professionalism. These could be delivered synchronously locally and regionally as well as delivered asynchronously through online modules or webinars.

3. Administrators need to be informed of the problems identified in this study faced by beginning FACS teachers and strategize a plan of action to resolve or curtail the identified problems. For example, the use of mentoring, one-on-one 'wellness' checks, or provision CTE area programming. Additionally, administrators need to be proactive in helping beginning teachers during their induction period.
4. Teacher educators and induction coordinators could use the problems described in this study as a foundation for case studies. These authentic case studies could be used as instructional tool in an effort to expose pre-service and beginning teachers to potential problems they will likely encounter. Conversations about dilemmas prior to their occurrence can help novice teachers identify multiple solutions or consequences in handling problems, sharpen their decision making skills, and improve their confidence.
5. Teachers beginning their careers could benefit from a mentor. To be most effective, however, the mentor would need to be a FACS teacher or if there is not a FACS teacher in proximity, a senior CTE faculty member could suffice. Giving beginning teachers an outlet to safely express concerns or seek advice could dictate the novice teacher's success or failure in the classroom.
6. Pre-service or beginning teachers [who migrate] need to ask during their interview to what extent is induction programming offered to beginning teachers, specifically in the area of FACS.
7. Pre-service teachers and beginning teachers need to be informed of the importance of professional organizations and the benefits associated with being a member. The major benefit is networking. Teachers can 'bounce' ideas of each other, share lessons or projects, and seek or give advice.

By adequately preparing FACS teachers at the pre-service and entry levels to handle potential problems, the profession can increase job satisfaction and reduce teacher attrition. Further research should include (a) a follow-up study to determine improvement of problems described by beginning FACS teachers over time; (b) survey and conduct interviews with school administrators to find if they view the described problems in this study as relevant; (c) survey and/or conduct focus groups with FACS teachers and administrators to seek resolutions to the identified problems; (d) observe and interview effective teachers on how they manage their classroom; and (e) expand the scope of the study to a regional population.

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**Citation**

Arnett, S. E. (2012). Problems encountered by beginning family and consumer sciences teachers. *Journal of Family and Consumer Sciences Education*, *30*(2), 34-44. Available at http://www.natefacs.org/JFCSE/v30no2/v30no2ArnettProb.pdf

# Clothing and Textiles: Reinforcing STEM Education through Family and Consumer Sciences Curriculum

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*Advances in science and engineering are essential for ensuring America's economic growth and national security, according to the Alliance for Science and Technology Research in America (2010). Family and Consumer Sciences (FCS) programs can respond to this demand through the identification of parallels between science, technology, engineering, and math (STEM) education and clothing and textiles curriculum. FCS can help prepare young people for science and engineering careers related to the design, production, distribution, use, and disposal of clothing and textile. The purpose of this paper is to illustrate the opportunities for FCS teachers to strengthen student comprehension of STEM concepts utilizing clothing and textiles-related curriculum and/or courses. A teaching strategy for reinforcing STEM concepts and the integration of FCCLA to address this need is presented.*

The U.S. Bureau of Labor Statistics (2010) stated that 16 of the 30 fastest-growing occupations projected through 2016 would require substantial mathematics or science preparation. But the country's high school students are not performing well in math or science, and fewer of them are pursuing degrees in technical fields. Even though greater emphasis is being placed on STEM fields, more work needs to be done to reinforce these concepts across disciplines (Association for Career and Technical Education, 2009). The instructional approach used by Career and Technical Education (CTE) programs can strengthen students understanding of STEM content and increase interest in STEM career pathways (ACTE, 2009). Not only are course offerings a concern of stakeholders and policy makers, the engagement of students in relevant learning experiences also impacts educational reform decisions. According to Yazzie-Mintz (2010), 49 percent of high school students are bored with school every day, and 17% with every class they take. To remain engaging and competitive in the global economy, the U.S. Department of Education (2010) recommends that our nation raise our expectations in order to ensure that every student graduates from high school well prepared for college and a career. Family and consumer sciences courses reinforce science, technology, engineering, and math (STEM) principles while engaging students in hands-on and relevant learning activities. Pathways associated with FCS and clothing and textiles content correspond to postsecondary education, college, and a wide variety of career opportunities. Specifically, the clothing and textile industry employs individuals in a variety of fields including design, manufacturing, distribution, marketing, retailing, advertising, communications, publishing, and consulting. Even though STEM professions might not require skills associated with clothing construction on a daily basis, having a course that develops future employees' comprehension of a process and piece of the clothing industry would be beneficial.

Careers of the 21st Century require high school graduates and future professionals who can use higher-order thinking skills (analysis, synthesis, and evaluation of concepts), problem solve, and work effectively in a team. Each of these skills are integrated into the curriculum completed by students enrolled in a clothing and textiles-related course in a junior high or high school setting. FCS teachers integrate research-based teaching strategies, such as inquiry-based instruction, to challenge students to innovate, develop, and complete useable products showcasing clothing and textiles content and higher-order thinking skills. Family, Career, and Community Leaders of America (FCCLA) assists teachers in maintaining student interest while connecting to real world issues and career preparation. To assess student outcomes in clothing and textiles and FCCLA, rubrics are used along with performance-based assessments to document a student's use of knowledge, skills, and abilities necessary for the workplace and life. This paper seeks to develop a rationale for secondary clothing and textiles curriculum, identify correlations between FCS national standards and key STEM principles, illustrate the use of a research-based teaching strategy to reinforce STEM concepts in the FCS classroom, and identify an FCCLA STAR Event that strengthens the connections between FCS and STEM. Overall, family and consumer sciences secondary courses bolster the current offerings in science, technology, engineering, and math by using real world and relevant examples such as clothing.

## A Rationale for Clothing and Textiles Curriculum

The perennial issue of clothing design, production, manufacture, use, and disposal requires the integration of key STEM principles and educational frameworks. For example, the National Research Council (2012) developed a new vision for K-12 education in the sciences and engineering designed to actively engage students in scientific and engineering practices while applying crosscutting concepts to deepen their understanding of core concepts. In science, engineering and FCS, learning experiences provide students with fundamental questions about the world (National Research Council, 2012). Clothing and textiles curriculum outlined by the competency-based, conceptual and process perspectives of the *National Standards for Family and Consumer Sciences* (National Association of State Administrators of Family and Consumer Sciences, 2008-2018) identifies academic knowledge and a framework for posing fundamental questions about the world. In order to identify possible solutions to real world issues across disciplines, students must carry out scientific investigations and engineering design projects related to disciplinary core ideas (NRC, 2012).

Clothing and textiles is relevant as a field of study because each day individuals and families dress their bodies. Further, clothing production around the world fulfills a basic human need. Specific scientific and engineering practices required in the development of clothing for consumers includes asking questions (for science) and defining problems (for engineering); developing and using models; planning and carrying out investigations; analyzing and interpreting data; using mathematics and computational thinking; constructing explanations (for science), designing solutions (for engineering); engaging in argument from evidence, and obtaining, evaluating, and communicating information (NRC, 2012). In addition, the sociocultural and personal expression of an individual's identity is communicated directly through clothing. Students can analyze the function of specific garments based on performance characteristics, personal needs and

wants, and develop a justification or argument related to what they should or should not wear. Not only is it an important task each day, but clothing can also impact social interactions. There are many reasons why individuals dress themselves—for personal satisfaction, to communicate individual identity, for protection, or to advance the abilities of the body (Eicher, Evenson & Lutz, 2008).

Secondary clothing and textiles-related courses offer middle and high school students the opportunity to explore clothing as it expresses their basic needs and values. Potentially, these courses could facilitate the investigation of clothing construction practices of individuals living in various cultures outside and within the United States. Clothing can communicate individuality and an individual's position within various social systems: family, economy, religion, and community to name a few. Due to the increased interdependence of our world there is a great need for youth to be aware of and appreciate cultures other than our own.

The learning outcomes of clothing courses around the nation, and in Utah specifically, require students to apply STEM concepts through a variety of hands-on, laboratory-based learning experiences. The skills associated with clothing construction courses are transferrable to other careers in the textile industry that would be considered STEM-related careers (i.e., Product Development Engineer, Webmaster, Transportation Logistics Specialist, Network Analyst, etc.). The National Standards for Family and Consumer Sciences (NASAFACS, 2008-2018) that guide the development of secondary curriculum related to textiles, fashion, and apparel focus on students mastering the comprehensive task of "integrating knowledge, skills, and practices required for careers in textiles and apparel." For example, the textile industry manufactures materials used by a variety of companies that meet the basic human needs such as food and shelter. Fabrics and construction techniques are used in the food industry to provide plant covers, absorbent liners in prepackaged meats, and reusable cloth bags (Cohen and Johnson, 2010). In relation to shelter, fabric and construction techniques are used to create tents, building materials (insulation made from recycled denim blue jeans), and awnings. Cohen and Johnson (2010) asserted that textiles are found in every aspect of our lives, from the carpet we walk on and the bandages covering our injuries, to a factory conveyer belt and the space vehicles orbiting the earth.

As an industry, apparel construction and textile development companies have contributed significantly to the initial growth of the United States (Cohen and Johnson, 2010). The first craft to be mechanized using technology and engineering practices was the textile industry. Specifically, cotton was the first interstate commerce transporting the fiber cultivated in the South to the factories in the New England area (Cohen and Johnson, 2010). A majority of the 100,000 dollars earned by the 106 companies in the manufacturing industry in 1832 was provided by 88 textile companies. The textile industry is seen as a key contributor to the growth of not only the United States economy, but also when the devastating earthquake struck Haiti in 2010. Textiles were seen as the industry that would assist in the recovery of that economy. The United States Agency for International Development (2010) assisted the Haitian Government in developing the Haiti Apparel Center (HAC) to help in the continued development and expansion of Haiti's garment industry. The textile industry in Haiti produces about 75% of the country's exports in the form of clothing and before the earthquake, more than 25,000 Haitians worked in the apparel industry. This new center (HAC) seeks to provide

Haitians with the skills needed to work in the garment industry with the ultimate goal of assisting them to earn a better wage. The skills and knowledge associated with clothing and textiles have proven to be relevant with a huge impact on the quality of life for individuals and families in the United States and from around the world.

Since the apparel and textile industries can be seen as a boost to local, national, and international markets, there is great need for youth to be aware of the practices associated with the production of their clothing. Asking the questions, "Where does my clothing come from; how is it made?" are essential for the education of wise consumers of the future and professionals who are motivated to develop new products. While exploring the process of clothing construction in an introductory or advanced clothing and textiles middle or high school course students are challenged to think critically about their personal clothing purchasing habits. When students master the National Standard for Family and Consumer Sciences content standard 16.4 (NASAFACS, 2008-2018) "demonstrate skills needed to produce, alter, or repair fashion, apparel, and textile products" they are able to transfer these skills to the identification of garments that are constructed meeting high quality industry standards. For example, when a student is required to insert a zipper into a garment, they see firsthand what a correctly constructed zipper looks like. This hands-on experience can be useful when they inspect a zipper in a future clothing purchase of a pair of pants, a dress, or a jacket.

Students are not only challenged to demonstrate a new skill, but also the learning experiences associated with clothing and textiles courses can integrate the National Standard for FCS (NASAFACS, 2008-2018), reasoning for action. Specifically, students "demonstrate scientific inquiry and reasoning to gain factual knowledge and test theories on which to base judgments for action." Reasoning for action can be integrated into learning experiences when an FCS teacher utilizes teaching strategies such as inquiry-based instruction. The following discussion will correlate the family and consumer sciences national standards for textiles, apparel, and fashion with STEM concepts while providing information on strategies for using inquiry-based instruction.

## Science, Technology, Engineering, and Math (STEM) Standards and FCS

Clothing and textiles curriculum for FCS students in high school reinforces standards for science, technology, engineering, and math required for graduation. To illustrate this point, the following discussion outlines the steps associated with the design, production, distribution and disposal of a clothing item first developed in the United States and now iconic worldwide: the denim jean.

**Cotton and fabric production.** The production of cotton, one of the world's most widely produced fibers, is the first stage in the manufacturing of blue jeans. According to Johnson and Cohen (2011), about 24 ounces of cotton fiber is used to produce one pair of jeans. Exploring the process of manufacturing cotton fabric to produce apparel, home, or industrial products requires students to analyze concepts related to physical, life, and engineering application of science. In an FCS course, students are challenged to evaluate fiber and textile products and materials (NASAFACS, 2008-2018). To accomplish this task, students use science process and thinking skills. Specifically, the goal of the science curriculum is to provide secondary students with the opportunity to develop an appreciation for science and to "use science as a process of obtaining knowledge based upon observable evidence" (Utah State Office of Education,

2003).  In a laboratory setting, students are given samples of natural and synthetic fibers to identify, compare, and analyze the observable performance characteristics or traits of each fiber and/or fabric.  Throughout the laboratory experience, students record both qualitative and quantitative information about each fiber or fabric (USOE, 2003).  This information can be used in order to draw conclusions about which fibers are best for specific end uses, such as jeans.  The physical and chemical properties of fibers can be further identified through a burn test administered by an FCS teacher.

The process of producing cotton can have adverse impacts on the environment. Specifically, cotton production can involve the use of pesticides and insecticides that can be a serious hazard to the health of farmers and consumers (Mancini & Mancini, 2009). Cotton farmers, producers, and manufacturers are working together to develop new technology and innovations to minimize the negative effects on farmers, factory workers, and other employees involved in this stage of the lifecycle of jeans and other cotton fiber clothing and/or materials. The application of STEM concepts is needed to address this environmental concern and provide a foundation for the development of new practices. In FCS courses students evaluate the elements of the textile, apparel, and fashion merchandising industry (NASAFACS, 2008-2018).  According to the National Standards for FCS (NASAFACS, 2008-2018) students should be able to summarize textile legislation, standards, and labeling in the global economy and consider the effects of textile characteristics on the design, construction, care, use, and maintenance of products. Similarly, in technology and engineering education, students are challenged to demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology (International Society for Technology in Education, 2007). The integration of FCS and Technology and Engineering Education (TEE) concepts allows for students to use a real world issue as the context for innovation and creative or critical thinking.  Further, TEE standards require students to develop an understanding of the effects of technology on the environment (International Technology Education Association, 2007).

**Garment manufacturing.**  This stage involves the cutting, sewing, and finishing of the final product to be sold on an international market.  FCS programs offer courses related to clothing construction at various levels for secondary students.  The National Standards for FCS outline that students should be able to demonstrate the skills needed to produce, alter, or repair fashion, apparel, and textile products (NASAFACS, 2008-2018). To produce a textile product, such as the denim jean, it is necessary for students to use technology concepts, systems and operations (ISTE, 2007).  The sewing machine, serger, and other computer-aided systems are used on a regular basis in the clothing and textile laboratory in a secondary school.  Jeans are constructed using basic geometric shapes and angles, and also, the development of the sewing pattern requires the application of specific geometry standards. These concepts reinforce the requirement that students who complete a high school geometry course in Utah be able to "perform basic geometric constructions, describing and justifying the procedures used" (Utah State Office of Education, 2007).  A performance indicator included in this standard requires students to "construct perpendicular and parallel lines and to copy and bisect angles and segments" (USOE, 2007).  Each of these expectations can be accomplished through the completion of student projects in an FCS clothing and textiles classroom.

Clothing is constructed to fit the 3-D form of the human body. The measurements of the consumer or client who will be purchasing or wearing the final product, in this case denim jeans, need to be taken into consideration. High school geometry curriculum requires students to use "algebraic, spatial, and logical reasoning to solve measurement problems" (USOE, 2007). A garment cannot be constructed without utilizing geometric concepts and competencies. Students must refer to the pattern size appropriate for their body in order to purchase the correct amount of fabric to correlate with the body and pattern measurements being used to complete the project. Further, the Common Core State Standards Initiative (2010) challenges teachers across the nation to focus on eight core mathematical principles. FCS teachers reinforce five of these principles while facilitating student learning in clothing and textiles sewing laboratories. The specific mathematical principles met in FCS clothing and textiles curriculum are for students to be able to:

  1) Make sense of problems and persevere in solving them,
  2) Reason abstractly and quantitatively,
  5) Use appropriate tools strategically,
  6) Attend to precision, and
  7) Look for and make use of structure (National Governors Association Center for Best Practices, & Council of Chief State School Officers, 2010).

**Transportation and distribution.** The textile industry employs individuals in a variety of career paths in order to successfully distribute clothing and textile products to consumers around the world. FCS standards state that students should be able to analyze career paths within textile, apparel, and design industries upon completion of courses in this content area (NASAFACS, 2008-2018). Clothing and textile companies transport and distribute their finished products to retail, online, and wholesale locations across the globe. This system requires the use of effective communication and collaboration and the use of technology operations and concepts to ensure on-time and accurate delivery. TEE challenges students to demonstrate, through the use of technology systems, mastery of technology operations and concepts. Correlation between FCS and TEE concepts is evident in this stage of the lifecycle of denim blue jeans. Not only is technology used in the transport and distribution of products, but clothing companies are also tracking the environmental impacts of various products from design through delivery. Programs such as GIS (Geographic Information Systems) can be used to provide basic product information to the consumer. Specific metrics calculated or documented during the production of denim jeans or other products include: energy consumption, $CO_2$ emissions, waste generation, and water use (Patagonia, 2009). These calculations can allow for students to apply math and science concepts as well as TEE required learning experiences.

**Consumer use.** The methods that consumers use to care for various clothing products, including blue jeans, can result in the greatest impact clothing has on the environment. According to Levi Strauss (2010), consumers can reduce the negative environmental impacts of their jeans by up to 50% by line drying and washing them in cold water. Family and consumer sciences (FCS) curriculum requires that students are able to apply appropriate procedures for the care of textile products (NASAFACS, 2008-2018). To meet this standard, secondary students need to be able to analyze chemicals in

society and how use of various products for the laundering of clothing impact the fibers in specific garments.  Also, when considering the removal of various stains that can occur, students need to be able describe and explain chemical reactions.  Are there chemicals that should not be mixed when laundering clothing?  By combining certain products, can a better result be achieved?  Both of these tasks are associated with required science standards for secondary students.  Overall, clothing is a necessary basic human need in our society.  The integration of clothing care and use information can assist consumers in making informed decisions about what clothing to purchase and how to maintain the quality of their purchase.

   **Garment recycling.**  The population of the United States discards around 11.9 million tons of clothing and textiles per year (USEPA, 2008).  Clothing and textile companies are developing strategies for consumers to recycle their unwanted or gently used clothing products.  When students are participating in a clothing and textiles course offered through FCS, they can be challenged to "generate design that takes into consideration ecological, environmental, sociological, psychological, technical, and economic trends and issues (NASAFACS, 2008-2018).  Students can apply the elements and principles of design to recreate clothing and textile materials into new products or innovations.  Similarly, TEE programs challenge students to be innovative and create new products or designs while considering the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving (ITEA, 2007).  FCS students not only use the processes required in TEE education, but math concepts and techniques are also necessary.  Clothing designs bring shapes and measurements to life.  By repurposing clothing, students are taking a shape or form of clothing and rearranging the shapes to result in the same measurements of the wearer.

   As evidenced by an everyday product like the denim blue jean, students can be exposed to important concepts and learning experiences in science, technology, engineering, and math within the clothing and textiles laboratory facilitated by an FCS teacher.  Clothing and textiles curriculum also provides students with relevant and real world connections to the standards and competencies that are not only required for high school graduation, but can also help them be successful in STEM fields later on.

### A Research-based Strategy for Teaching STEM Concepts through Clothing and Textiles

   The approach used by teachers to develop curriculum and provide instruction in the FCS classroom is key to engaging students in the development of solutions to real world issues in our society.  Life does not stop at the doorstep of the FCS classroom, but students are given the opportunity to explore creative and plausible solutions to everyday issues impacting the quality of life of individuals, families, and communities.  There are a variety of real world issues that can be addressed.  Each stage involved in the production of clothing can integrate the exploration of a relevant issue to youth today.  When designing and implementing FCS clothing and textiles curriculum to reinforce STEM concepts, there are a variety of research-based teaching strategies that can be used.  One specific strategy is inquiry-based instruction.

   Inquiry-based instruction, a research-based teaching strategy, incorporates both inductive and deductive reasoning while students are actively engaged in identifying solution(s) to a problem or situation.  Clothing and textiles-related courses provide

secondary students with multiple topics and situations that require them to think critically about how they would approach the situation. This teaching strategy focuses on the process of investigating the problem rather than on the correct solution (Moore, 2010). The following discussion will outline the integration of inquiry into a clothing and textiles-related lesson plan.

**Phase one.** Upon completion of the learning experience, students will be able to apply appropriate procedures for care of textile products (NASAFACS, 2008-2018). The first step in the inquiry process confronts students with a problem or issue. The teacher provides students with information about inquiry procedures and introduces the discrepant event, situation, or issue (Suchman, 1962). During the first few minutes of class, students are introduced to the issue of caring for textile products. The most difficult stains to remove (antiperspirant, ball-point ink, butter/cooking oils, catsup/pasta sauce, collar/cuff rings, dirt/mud, dirty socks, fruit juice, grass, motor oil, mustard, and perspiration) will be presented on white t-shirts for the students to remove. Once students develop an awareness of the issue, the second step of inquiry can be completed.

**Phase two**. Verification of the nature of the situation through the gathering of data is the next phase for students to complete. While in groups, students will focus on different stains to remove. To verify the nature of the situation, students will have to identify the fabric type, type of stain, and any other characteristics of the stain that can aid in removal. Specific engineering and scientific practices that students will use in this phase of inquiry are asking questions (science) and defining the specific characteristics of the problem (engineering), planning and carrying out the investigation, and analyzing and interpreting the data collected.

**Phase three.** Next, students experiment with the data to begin the process of hypothesizing and testing solutions to the situation. For phase three, students will carry out the experiment testing various stain removal techniques and solutions. This experiment will require multiple samples of the stained garment in order for students to identify the best solution and develop a justification based on the evidence. Throughout this step, students apply appropriate procedures for the care of textile products (NASAFACS, 2008-2018).

**Phase four.** Before the lesson is complete, students must organize, formulate, and provide an explanation of rules created to guide their personal solution to the issue. Are there specific stain removal procedures that are best for different fibers and/or stains? Is there a chart, graph, or table that can be created to help students organize the data? The process of graphing or charting findings correlates to science and engineering education.

**Phase five.** To conclude the lesson, students would evaluate the use of the inquiry process in this situation in order to refine the process for future events, situations, or issues. The identification of other applications of inquiry can be useful for students to comprehend the real world connections and applications of this strategy for addressing a discrepant event, situation, or issue. Multiple applications of this research-based teaching strategy in the family and consumer sciences classroom exist. Whether students are researching a common everyday issue or a complex situation with a variety of factors, this technique can prepare students to think critically about life situations.

**Integration of FCCLA into Curriculum**

Family, Career, and Community Leaders of America provides secondary teachers with curriculum resources that can strengthen student comprehension of STEM concepts. Across the nation, some FCS teachers are expected to integrate FCCLA into curriculum and/or the FCS program. Whether FCS teachers integrate a STAR Event or an FCCLA National Program into a course, the learning experience transforms students' knowledge of content, skills, abilities, and leadership capacity. Teachers can integrate a variety of STAR Events to address STEM concepts. For example, the Recycle and Redesign STAR Event requires students to select a used fashion, home, or other post consumer item to recycle into a new product (FCCLA, 2011-2012). The new product is assessed based on the student's effectiveness of product design, overall quality of workmanship, creativity, imagination, and innovation, and other skill-based techniques (FCCLA, 2011-2012).

The Recycle and Redesign assessment begins in the final stage of the life cycle of a garment, garment recycling. Since the life of a recycled garment extends the use of the original product, students participating in the event would need to refer to the beginning of the cycle to inform the development of their new product. For example, the assessment requires students to incorporate a material or fabric profile in the final display of their work. The fiber content and type, construction, finishes, properties, performance, and care of the original fibers used should be documented. This process relates to the first stage in the life cycle of a garment, cotton and fabric production. In addition to the correlations between STEM concepts and FCS previously outlined in the article, TEE standards addressed through this assessment focus on a student's ability to develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving (ITEA, 2007). Further, through the Recycle and Redesign STAR Event, students are able to select and use manufacturing technologies such as the sewing machine (ITEA, 2007).

**Conclusions**

Employers demand a workforce that is skilled in STEM-related concepts in order to compete in the global, fast-paced economy. Family and consumer sciences clothing and textiles related courses have a unique opportunity to reinforce STEM concepts in a rigorous and relevant way. Specifically, FCS clothing and textiles curriculum provides secondary students with laboratory-based experiences that will strengthen their comprehension of concepts and standards outlined in science, technology, engineering, and math education. Through continued development of the connections between family and consumer sciences, FCCLA, and STEM concepts, educators will see an increase in student motivation and preparation for STEM-related careers.

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**Citation**

# Developing Reflective Practice Skills Through the Use of a Road Map

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*The purpose of this study was to expose Human Ecology final year students to the use, creation and implementation of a roadmap as a vehicle for the development of reflective practice skills. Data was obtained through the road maps created by them as well as their written reflection on the whole process. Results indicate that students initially found it difficult to understand the value or purpose of the reflective process. It was envisaged that the output would point to an understanding in students of how the skills of critical reflection can be developed and that they gain an understanding of the benefits of reflective skills. The overall findings suggest that students' engagement with the road mapping process helped them to develop their reflective skills, which in turn had an impact on their personal lives and which will hopefully assist in their future professional lives.*

"We do not learn from experience. We learn from reflection on experience. Reliving of an experience leads to making connections between information and feelings produced by the experience" (Dewey, 1933, p. 78).

Working in a professional manner demands a continuous process of reflection, which involves looking at your practices, ideas and actions, then evaluating their effectiveness in order to make improvements both personally and professionally. The main attribute of a Human Ecology practitioner (also known as Family and Consumer Sciences in America and other parts of the world) is the ability to transform scholarly studies into meaningful action so as to empower individuals and families within relevant contexts to obtain social well-being. The importance of reflection which are "those intellectual and affective activities in which individuals engage to explore their experiences in order to lead to a new understanding and appreciation'' (Boud, Keogh & Walker, 1985, p. 19), is therefore an essential part of any professional role.

Doing so helps us to develop a sense of what has been achieved, what is likely to be achieved, and what could be done better. As students, and later in our careers as Human Ecology practitioners and Family and Consumer Sciences Educators, we are able with the method of reflective practice, to conclude, inform and broaden our practice knowledge.

Human Ecology is defined as a profession with an integrative and trans-disciplinary approach concerned with enhancing the quality of life by focusing on the interrelationships among individuals, families and communities and the multi-faceted environments in which they function (Stage & Vincenti, 1997). It is also described as an inter-disciplinary applied science concerned with the physical, psychological, social and material well-being of individuals and families through the use of knowledge, resources and the application of technology to meet their needs and expectations (Boshoff, 1997) and increasing their human potential within their micro-environment (Nicolescu, 1997). The mission of Human Ecology is in the empowerment of people by focusing on the improvement of quality of life, the satisfaction of expectations and the development of their potential through an interdisciplinary approach and within a holistic application context (Erasmus, 2007). Different skills and abilities, as well as the capacities which they will apply in assisting and empowering individuals, families and communities to take

initiative in acquiring a better life for themselves, in a more effective and sustainable manner, are needed by successful human ecology and community development professionals (McGregor, 2007, 2006; Cornelissen, 2006).

Reflective practice involves thoughtfully considering ones' own experiences in applying knowledge to practice (Schon, 1996). It requires us to look further, to examine ourselves and become "a person choosing to make visible and open to examination all that one believes, knows and does" (Vaines, 1997, p. 210). Hunt (2006) describes "reflective practice as a temporary resting-place on a journey where one's accompanying wagonload of ideas/experiences can be temporarily removed, checked and reordered . . . a place where one can look back along the road already travelled and at possible ways forward, and exchange stories with fellow travelers" (p. 322). Wade & Yarbrough (1996) indicate that as "we reflect, we discover the links between different aspects of our life experience and where past experiences are reconsidered in light of new information. Reflection allows us to draw conclusions about our past experiences and develop new insights that we can apply to our future activities" (p. 64).

Smith & Betts (2000) reiterates this and says that the quality of the learning, however, is not dependent on the quality of the experience, but on the quality of the process of reflection. A definition of reflection which brings together its many sides and conceptualizations is the one formed by Korthagen (2001) who states, "Reflection is the mental process of trying to structure or restructure an experience, a problem, or existing knowledge or insights" (p. 58). Maaranen & Krokfors (2007) rewrite this definition above as "reflection is a shared mental structuring process that takes place in both individual and collective settings of learning and has a positive social impact on the learning possibilities in the future" (p. 361).

Embracing reflective practice is not simply acquiring and utilizing new ideas and techniques, but striving towards becoming inquiry-oriented reflective practitioners who need to be self-analytical, critical of knowledge as well as creative in ideas (Ghaye, 2005; Rolfe, Freshwater & Jasper, 2001). Reflective practitioners work is a journey with multiple possibilities where keeping-up-to-date is less an instrumental goal than a deep desire to develop questions about the most responsible and caring ways of 'empowering' (Vaines, 1997). Being a reflective professional requires you to take the time to consider your work, reflect on its objectives and evaluate its outcomes. "As a mirror reflects a physical image, so does reflection as a thought process reveal to us aspects of our experience that might have remained hidden had we not taken the time to consider them" (Wade & Yarbrough, 1996, p. 64).

### Maps and Reflective Practice

Maps are important sources of primary information (Stevens, 2003) as well as abstract pictures of reality helping us understand terrain before, during and after we take a trip (Vaines, 1997). Stevens (2003) says that "maps can be seen as mirrors of realty" (p. 1), and using maps or mapping as a metaphor offer students the "ability to provide both a perspective and a way of looking at things and a process by which new perspectives can emerge" (Weber & Mitchell, 1995, p. 22). Atkins and Murphy (1993) state that "Reflection . . . must involve the self and must lead to a changed perspective" (p. 1191). Metaphors provide a useful way of seeing the familiar differently and, therefore responding to the familiar in different ways. 'Metaphor' meaning 'to transfer beyond' (Patridge, 1979) has at its roots the "ability to provide both a perspective and a way of looking at things and a process by which new perspectives can emerge" (Weber & Mitchell, 1995, p. 22). They provide "a way of thinking and a way of seeing that pervade how we understand our world

generally" (Morgan, 1997, p. 4). Vaines (1997), furthermore, suggests that maps can assist us in grasping a deeper understanding of being and becoming professional practitioners. The map is used to better understand reflective practice which is meant to empower, enlighten and emancipate individuals to make informed and meaningful choices with regard to our professional role (Vaines, Badir & Kieren, 1997).

## Methodology and Context

The target population for this study was fourth year students in the Human Ecology 430 course which deals with issues relating to the background of Family and Consumer Sciences/Human Ecology as well as professional development. These students' majors also included a module on Community Development. The majority of this group of students were Black, but the class also consisted of Coloured and White students, with different backgrounds in terms of culture, religion and economic status.

This was a stand alone assignment, but these students were exposed to reflection in other modules within the programme. However, this was the first time that they were exposed to 'mapping' as a tool for reflection. Permission was obtained from the students as they were old enough to give consent (they were all over twenty one years of age). Trust and confidentiality was achieved through the lecturer being the only person to read and evaluate the maps.

**Intervention/Procedure**

In the week prior to the handout of the assignment, the lecturer gave a presentation and lecture on reflective practice. The students also received various articles to read about reflective practice. An article about road mapping as a tool to understand the process of using a road map as a tool for reflecting/reflection was also given beforehand to read. The assignment and its expectations were discussed. Students then had to compile a rough version or draft of their road map indicating their past, present and their future. Students were required to identify where they have come from, where they are, and where they want to be in the future (personally and professionally), and to express this using a road map as a metaphor. They were also asked to indicate three places where they experienced detours, hazards and crossroads. Students were given a framework of two weeks to complete a rough draft of their maps before they submitted them to the lecturer. Feedback from the lecturer was given so that students could improve the content of their maps. The feedback was also an attempt for the students to engage more with the process of reflection. Students returned their maps two weeks later with a final copy of their road maps. At this stage students were also asked to provide a written reflection on the entire process by means of a self-reflection report.

Table 1 below illustrates the basic format the road mapping exercise took. At the end of the compilation and construction of their roadmap, students were invited to evaluate and provide written feedback on their experience of compiling their roadmap. The following steps were used as a guide in the process of creating their road map.

Table 1
*Steps to Follow to Construct Map for Reflection*

| Stage | Activity | Cues |
|---|---|---|
| One | Explore/Clarify | Think back on your past. <br> Write your life experiences down. |
| | Rough version of map | Construct your thoughts and experiences visually. |
| Two | | How did you find thinking back onto your past? <br> What were you thinking and feeling? <br> How did you decide to include or not to include? |
| | Reflection | Did you find it difficult to think back on your own life? |
| | Final road map & presentation | Where you hesitant to engage with the process? <br> What kind of feelings and thoughts did you have? <br> How did you decide what should be on your final map? <br> How did you make sense of your situation/past/present? <br> What else could have been done? <br> Why are there detours and hazards? What did you learn from these stops? <br> How did you choose the places where you would like to stop and reflect on your practice/journey? <br> What are the consequences of my decisions and actions? <br> Identify strengths and weaknesses. <br> Analyze your feelings and resentment towards the process. |
| Three | Evaluation | Process used to construct my reflective road map <br>    How did you decide on the type and illustration of your particular map? |
| | Written reflections on the whole process | Emotional experiences while constructing my road map <br>    What were you thinking and feeling? <br>    How did you overcome the initial hesitancy/not wanting to face your issues? <br><br> Changes brought about to own map <br>    Why did you bring about changes? <br>    Learning took place: making sense of past experiences to inform future practice <br>    How did you feel about these experiences? <br>    What did I do with my strengths and weaknesses? <br>    How has this experience changed by my way of knowing, understanding, etc. |

Is the reflective practice really relevant
Can I use reflection as a tool to deal with my emotions and move forward?
Does it bring clarity to issues that are unclear to you?

## Results

Reflective practice is "a revisiting of an event in order to understand it better" (Check & McEntee, 2003, p. xiii). It is also the active process of witnessing our own experience in order to take a closer look and to explore it in greater depth. Learning to take ownership of one's own actions and perspectives open up the possibilities of purposeful learning (Amulya, n.d.). Comments voiced by students illustrated that they found this type of exercise different and for some it took a little while to become more comfortable.

Some students initially identified difficulty in understanding the value or purpose of the reflective process or the strategy used to facilitate reflection. During the very first contact with the process of reflection, resistance and difficulty to start and to proceed were evident.

*When I was told to do the task, I was shocked. When I was thinking of the task I just became very angry and sad. I hesitated to do the task and waited till the last minute.*

*The initial experience surrounding the assignment was one of "flight and fright."*

*Much apprehension when assignment was given; put it off, then got angry and frustrated because I knew I was compelled to do the task given.*

To be reflective entails being able to step back from the immediacy of the situation and examine one's beliefs, attitudes, values and behavior in a dispassionate manner (Jackson, 1990). Appropriate support and guidance is needed to assist students to see the benefits of reflection in terms of their own learning. On reflection on the emotions they experienced while constructing their road map, students had different experiences:

*Was difficult at first, did not want to expose myself and therefore only put the lesser emotions and experiences on my chart, in that way people could not judge me.*

*After receiving the instructions to construct our personal road maps I was a bit hesitant, felt boring – know my life already. Then I started feeling uncertain as to whether or not I would do a good job. As I started to think about it more, I became excited as I began conceptualizing how I would go about constructing my road map. While I was putting everything together I became more keen and enthusiastic.*

Awareness of our attitudes and emotions is an integral part of appropriate reflective practice. Reflection . . . must involve the self and must lead to a changed perspective (Hunt, 2001). Evidence of this was given by a few students.

*The self-reflection process was an interesting concept. . . . The exercise helped me deal with some feelings and I can now move forward. . . . When I had to put my feelings into words, my vocabulary was limited. I realized that I felt more anger and hurt all the time; had been carrying this baggage with me for many years.*

61

*While presenting my road map, comments from the lecturer and fellow students gave me an understanding of my situation. I found this to be very inspiring and meaningful. If I had not done it, I would not have learned and gotten an understanding of my situation and most importantly the advice given was important and valued by me.*

*. . . the reflective exercise has provided me with a building block on which to choose my direction effectively; has provided me with not only a clearer stance with regards to where I am, but a firmer stance in where I want to be.*

Brown & Paolucci (1978) state that to be a professional, Human Ecology practitioners must engage in self-reflection and self-critique so that they can present themselves to the public in such a way that society is clear about what they offer. On why Human Ecologists need to be reflective, students had the following to say:

*Human Ecologists should be reflective individuals as they deal with people from various backgrounds and generations. The professional also has to reflect on a continuous basis in order to remain current with issues regarding development studies and life in general in order to effectively satisfy the people they are assisting. We should also not become stagnant but should constantly review and evaluate our surrounding contexts so that we can move with the times and remain a relevant discipline.*

*Reflective practice supports the Human Ecologist in remaining abreast of situations affecting individuals and families . . . provides clarity on our position as well as the opportunity to move forward; granting Human Ecologist the opportunity for constant renewal.*

The best evidence of the power of a reflective activity is when the learning revealed can be seen to be beneficial to the personal growth of the student (Doel, 2009). The findings indicate clearly that the use of road maps has a powerful function as a catalyst for reflection and critical dialogue amongst students:

*The exercise has brought about a significant change in me and has made me aware of caring for myself. While doing the presentation I have come to realize that there are still various opportunities for me. I had limited myself.*

*I believe that reflective practice is extremely relevant to many people. What was astounding was that there were events and happenings in my own journey that I had just taken for granted. If people become reflective and look back on decisions made and actions taken, they can become more empowered concerning future decisions.*

The overall findings suggest that students' engagement with the road mapping process helped them to develop their reflective skills, which in turn had an impact on their personal lives and which will hopefully assist in their future professional lives.

**Conclusion**

  This paper describes the implementation of a roadmap as a vehicle for the development of reflective practice skills.  This study has shown that there were clear benefits to students to partake in developing a road map for themselves.  Their comments also illustrated a realisation of reflecting on their life, their decisions and their experiences. This process presented students with an opportunity to question their existing personal and eventually their professional practices that will possibly lead to reform of personal theories and change to their practices. I do believe that the reflective map is good practice and all students should be exposed to it. To this end I recommend further research on this model to refine and also to test whether it is applicable to other disciplines. I also recommend further study into the extent into which the skills and process of reflective practice, if taught at the undergraduate level, are transferable to the post-graduate stage and early professional life. "Experience becomes educative when critical reflective thought creates new meaning and leads to growth and the ability to take informed action" (Bringle & Hatcher, 1999, p. 180).

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## Citation

# Diversity Needs: Preparing Family and Consumer Sciences Teachers for the 21st Century Classroom

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*Changing student demographics have resulted in a great deal of attention in Illinois on how to best prepare family and consumer sciences (FACS) pre-service teachers for entrance into a diversified classroom. The research objective of this study was to determine diversity curricular needs for Illinois FACS teacher educators. Qualitative responses from two groups, FACS teacher educators and FACS beginning teachers in Illinois, formed the data. Findings indicated more diversity education and training is needed among both groups. Cases studies were identified by both groups as an effective instructional tool to teach about diversity. Sample cases studies on diversity are provided.*

In Illinois, diversity in education has been recognized as a top priority among state and local educational leaders. As the student populations in schools are becoming increasingly diverse, the [Illinois] State Board of Education (ISBE) needed to respond with educational reform efforts that meet the needs of all students. As a result, Illinois recently modified the Illinois Professional Teaching Standards (IPTS) and identified *Teaching Diverse Students* as the number one standard to be addressed. Standard 1 – *Teaching Diverse Students* is defined by the State as "the competent teacher understands the diverse characteristics and abilities of each student and how individuals develop and learn within the context of their social, economic, cultural, linguistic, and academic experiences" (ISBE, 2010). By giving preference to diversity, Illinois is aligning with the instructional dynamics needed to teach in a 21st century classroom.

The changes in population demographics have prompted the examination of programming and practices of diversity among teacher education programs. Researchers have confirmed teacher education programs have not adequately kept up with the cultural climate of today's classroom (Alexander, West & Ebelhar, 2007; Zeichner, 1992). The lack of teacher preparedness can have negative effects on students' academic performance and persistence, (Zeichner, 1992) thus underlining the need to increase diversity education in teacher education programs. Education diversity is defined as the interaction between individual differences among teacher and students in, but not limited to, learning needs, emotional needs, culture, gender, life experiences, life situations, age, sexual orientation, physical abilities, cognitive abilities, behavior, skills, strategies, language proficiency, beliefs, goals, personal characteristics, and values (Lenz, Deshler & Kissam, 2004).

The National Center for Education Statistics predicts that by 2018, one in two students in school will be labeled as a diverse student. All the while, the national pre-service teacher population continues to be reflective of white, female, and middle-class characteristics which results in greater social, cultural, and academic distance within the teacher-student interaction (Chisholm, 2004; Teachers Shortage Areas, 2006). Chisholm (2004) indicated that most novice teachers lack the knowledge, skills, and experience that build the requisite professional assurance for working with diverse students. In fact, Brown (2003) suggested one of the top three challenges causing major frustrations in the beginning teachers' classroom was diverse student needs.

Diversity in teacher education programs continues to be integrated in a fragmented way by looking at issues separately from other university and practical experiences (Valentin, 2006). For example, programs may require a course in multicultural education taught by the education department and/or observation in a diverse classroom setting for a minimum number of hours. In both of these strategies, the pre-service teacher is a passive participant and not engaged in the learning process. Rehm and Allison (2006) emphasized teacher candidates need to understand how diversity impacts their application of teaching strategies to meet the learning needs of all students.

Acknowledgement of the changing demographics has resulted in a great deal of attention focused on how to best prepare pre-service teachers for entrance into the diversified classroom. Brown (2003) reported that teacher educators struggle with the challenge of preparing teachers for a pluralistic society. In the area of Family and Consumer Sciences (FACS) education this issue is no exception. A common problem among Illinois FACS teacher educators is how to adequately address diversity in their teacher education programs (D. Hopper, personal communication, April 2011). Therefore the objective of the research project was to determine diversity curricular needs for FACS teacher educators in Illinois. As a result, Illinois FACS teacher educators can be better positioned to prepare their teachers for entrance into diversified classrooms.

## Methodology

### Research Objective

The research objective of this study was to determine diversity curricular needs for Illinois family and consumer sciences teacher educators.

### Method and Procedure

A qualitative research design was selected to examine the phenomenon in detail and allow the respondents to describe the situations in their own words (Ary, Jacobs, Razavieh, & Sorenson, 2006). Two questionnaires were developed: 1) for FACS teacher educators and 2) for beginning FACS teachers (teaching fewer than four years). The questionnaires contained questions to help guide the respondents to answer the research objective. Both questionnaires were pilot tested with university FACS faculty members (N=4) and secondary career and technical education (CTE) teachers (N=4). The questionnaire for the FACS teacher educators focused on diversity content needs while the questionnaire for beginning FACS teachers allowed them to reflect on how to assist their former teacher education program in efforts to strengthen diversity content.

Part one of the data collection processes was targeted at Illinois FACS teacher educators. Illinois has six accredited FACS teacher education programs. One FACS teacher education faculty member from each institution was contacted to request an interview. Each interview was conducted via the phone by the primary investigator and approximately 30 minutes in length. The questionnaire guided the interview process. Interviews were audio taped and transcribed. Transcripts were analyzed by themes and frequencies. A total of six interviews were completed.

Part two of the data collection was aimed at Illinois beginning FACS teachers. The survey was placed online using surveymonkey.com. A convenient sampling frame was used to email a cover letter that included the questionnaire link to beginning Illinois FACS teachers. Thirty-one respondents completed the questionnaire. The primary investigator transcribed the data, established response categories, and responses were placed in the categories. The

questionnaire, coding rubric, and final results of the coding were presented to FACS education professional colleagues to independently review to establish credibility of interpretation and to ensure conformability. Following a group discussion, data were recoded to establish the reliability and validity of the process.

## Findings

Responses from two groups formed the data to determine diversity curricular needs for Illinois FACS teacher education programs. The focus for FACS teacher educators' data was on content needs while beginning FACS teachers reflected on their experience in effort to assist in strengthening diversity content within their former FACS teacher education program.

### Illinois FACS Teacher Educators

A total of six FACS teacher educators, which represented one from each accredited FACS teacher education program in Illinois were interviewed. Respondents were asked, on a scale of 1 to 5 (1 = poorly to 5 = extremely well) "How well do you address diversity within your FACS teacher education program?" Five of the six respondents indicated a score of 3 or felt they were doing an 'average' job of teaching diversity within their program.

With the new Illinois Professional Teaching Standards, specifically addressing Standard #1, Teaching Diverse Students respondents were asked if they had to alter their curriculum to include the topic of diversity. Four respondents reported, "Yes, modifications to the curriculum are needed." One FACS teacher educator stated, "We need to expand the ways we meet the diversity standard within our methods courses. I'm in the progress of developing a diversity lecture on differences of learners." Another educator communicated, "I'm looking for a diversity course taught within the education department at our university."

The educators were asked, "Do you feel adequately qualified to teach diversity to pre-service teachers?" Two educators indicated, "not really, but will educate myself." One educator reported, "She's taken a class on diversity in graduate school," and another stated, "she taught in a high school with a high percentage of diversity."

In a final question the FACS teacher educators were asked, "What type of curriculum would be most beneficial for you to address diversity within your FACS teacher education classes?" Four respondents noted, "case studies," and two identified, "hands-on activities."

### Illinois Beginning FACS Teachers

Thirty-one beginning FACS teachers completed the questionnaire. Respondents were asked, "How do you define diversity?" The most common term used to begin each definition was 'differences' followed by 'characteristics.' The top five characteristics identified were gender, culture, ethnicity, socioeconomic, and religion.

When asked on a scale 1 to 5 (1= poorly to 5 = extremely well) how well are you handling diversity within your classroom, 90% of the respondents reported a score of 3 or 'average.' A follow up question asked was, "What challenges have you experienced with diversity in your classroom?" The top three challenges identified were did not know cultural backgrounds, English as second learners (ESL), and varying academic levels in the same class. One teacher stated, "Pre-service teachers need to witness classrooms with high levels of diversity so that they can get a better feel of what to expect in their future careers and survive." Another teacher noted, "I feel I don't get the students respect because I come from a different background." One responded with, "I am a non-Hispanic teacher teaching in a 90% Hispanic

school.  I wasn't prepared for the extreme backgrounds and the effects it has on their attitudes towards me." Other noted challenges were gangs, getting all learners to care, not having a bias in my own teaching, and more time needed with support staff (case workers).

A final question was asked to list suggestions on how FACS teacher education programs could better prepare incoming teachers for diversity within a classroom. Responses included the following: training on students involved in the justice system, diversity teaching ideas, require a diversity course, observation of classrooms with diversity, and case studies.

### Conclusions and Implications

The objective of this research study project was to determine the diversity curricular needs for Illinois family and consumer sciences teacher (FACS) educators. The conclusions from the data were framed from qualitative responses of two groups: (a) Illinois FACS teacher educators and (b) Illinois beginning FACS teachers. The data together provides a perspective from both sides of the desk to determine effective strategies to prepare incoming teachers for a diversified classroom.

The Illinois FACS teacher educators reported doing an 'average' job of teaching diversity, so it is not surprising that their recent graduated teachers feel 'average' in handling diversity within their classroom.  These findings support Chisholm (2004) who reported most pre-service teachers lack the knowledge and skills to work with diverse students.  This finding directly impacts three groups of people: 1) high school/middle school students- they may not achieve to their full academic potential or demonstrate a lack of caring; 2) teachers/pre-service teachers – may lack confidence in their teaching ability and become dissatisfied; and 3) teacher educators – produce teachers with a knowledge gap on student characteristics.  The cycle to improve diversity education starts with the FACS teacher educator.

Although there are a host of curriculum that needs to be addressed in pre-service teacher's program of study, FACS teacher educators realistically cannot be proficient in every topic.  The findings in this study revealed FACS teacher educators were not professional educated in diversity yet were responsible in either teaching or finding an avenue to include diversity education in their students program of study. To ensure pre-service teachers are being properly educated on diversity in a FACS classroom, FACS teacher educators should seek professional development on the topic of diversity, request educational training on diversity, or team teach with the diversity division at the university.  In Illinois, there is one FACS teacher educator per institution, so it would be advisable to consult external sources such as one's advisory board or an educational council committee for ideas on how best to integrate diversity content into the program and not undertake this task alone.

By knowing the challenges beginning teachers face, teacher educators can address these topics within their program of study coursework.  Realistic, engaging experiences with diversity such as witnessing and micro-teaching in multiple diversified classrooms should be included as continuous activities within coursework.  With all diversity experiences, either through a course, activity, service-learning projects, community outreach efforts, or observation, classroom conversations led by the FACS teacher educator need to occur that connects what a pre-service teacher learned and experienced to their FACS teaching repertoire.

Confirming Valentin's (2006) finding, FACS teacher educators identified singular ideas of how to integrate diversity within their programs such as requiring a diversity education course.  Diversity should not be treated as an isolated topic, meaning a single lecture or a class activity is not enough.  These methods potentially limit the connection of diversity content,

FACS subject matter content, and true application among pre-service teachers.  The topic of diversity needs to be infused using conversations, modeling teaching strategies, increasing cultural knowledge, and reflection opportunities throughout the curriculum so pre-service teachers are able to have a true understanding of diversity in education so all students are valued and supported to achieve maximum potential.

Interestingly both groups of FACS educators identified case studies as an instructional tool to use teaching diversity.  Conversations about diversity dilemmas can help beginning teachers identify solutions or consequences in handling situations, sharpen their knowledge set skills of diverse students, and improve their confidence.  Additionally, pre-service teachers can reflect on their own biases and application techniques.  As a result of this finding, a host of case studies focusing on diversity were developed by the researcher and two urban community high school teachers to implement in teacher education classrooms. Below is a sample of case studies.

## Case Study Samples
Group students or independently provide a solution to the following case studies.

1.  A female Hispanic student does not return a permission slip required for her to attend an overnight field trip with her class. This trip is viewed as a cumulating experience for this class and you have concerns with her potential non-attendance. Upon talking with the parents and grandparents of this child you discover that the family holds traditional Hispanic family values, where the women of the family are restricted to meet in mixed-sex groups outside of class.
    How do you effectively handle this situation with family members?

2.  You are a Caucasian female teaching a class where Latino students are in the majority. While they are media savvy and on the surface, quite acculturated, you learn through class discussions about the Latino families that some students hold traditional views about the roles of men and women in the family.
    Do you feel comfortable addressing gender issues in this class as a Caucasian female? How do you address issues such as gender discrimination in the workplace and gender roles in the home while still respecting the norms and values of these Latino students? How do you empower the female Latino students without taking anything from the male students?

3.  A group of American Indian children refuse to engage in activities during indoor recess. Specifically, you offer children the chance to play cards, board games, etc. but all these children want to do is hang out in the corner and talk. While there is nothing inherently wrong with their choice of activity, you are concerned with the lack of socialization they are receiving. After talking with them privately, you learn that they are afraid of losing their Native American culture by engaging in Euro-American games.
    How do you effectively handle this situation with this group of parents?

4.  Throughout the day, a persistent group of white males love to chase, tease, and bother another group of white females. These behaviors take place during PE, recess, and when the class as a whole is lined up at the door. While the girls never really object to the

attention they receive, you are concerned with the subliminal sexism messages being sent to the children who participate and witness these behaviors.

How do you effectively handle this situation with the parents of the white males?

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## Citation