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Evaluation of the Iowa Expanded Food and Nutrition Education Program and Food Stamp Nutrition Education

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Evaluation of the Iowa Expanded Food and Nutrition Education Program and Food Stamp Nutrition Education

by

Justine Reneè Hoover

A thesis submitted to the graduate faculty
In partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

Major: Nutritional Science

Program of Study Committee:
Ruth Litchfield, Major Professor
Michael Spurlock
Kimberley Greder

Iowa State University
Ames, Iowa
2007

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DEDICATION

This thesis is dedicated to the extraordinary staff of the Iowa Expanded Food and Nutrition Education Program and Family Nutrition Program.
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This research used qualitative and quantitative research methods to evaluate a new nutrition education curriculum and factors influencing implementation. Qualitative evaluation used structured observations of program participants and educators to examine theory based learning strategies (open-ended questions, visual aids, experiential learning activities) used by educators during curriculum lessons and focus groups to examine experiences and behavior change among program graduates. Quantitative evaluation assessed participant behavior change during an old curriculum (2005 and 2006) and a new curriculum (2007) using pre- and post-program 24–hour dietary recalls and food behavior surveys. Examination of participant, educator, and program characteristics determined factors influencing behavior change. Results suggest success of program graduates regardless of curriculum used, but identify several factors that influence the behavior change of participants. It is important for those who work with nutrition education programs to recognize these factors and control for them in order to maximize participant behavior change.
CHAPTER I: INTRODUCTION

Background

Many Americans live under the constraints of a limited income. Living with a limited income can cause mental and emotional stress. Physical stress also results from living with a limited income and can have a long term impact on overall health. It has been shown that people living with a limited income have higher rates of diet related chronic diseases such as hypertension and diabetes (National Center for Health Statistics, 2005; Centers for Disease Control and Prevention, 2006). On top of that, access to health insurance declines with decreasing income among Americans (Centers for Disease Control and Prevention, 2006). Without adequate health insurance, health care for those suffering from diet related chronic diseases can be limited, so an alternate path must be taken. One alternative is improvement in dietary practices in order to prevent or decrease the progression of diet related chronic diseases.

The Expanded Food and Nutrition Education Program (EFNEP) and the Food Stamp Nutrition Education (FSNE) seek to help families with a limited income use the resources available to them to improve food and nutrition related practices. In turn, the improvements made may help prevent the occurrence of diet related health problems in the future. Both of these programs use paraprofessional educators to teach nutrition concepts from the Dietary Guidelines for Americans, food shopping skills, and food safety concepts. The paraprofessional educators use different curricula to teach depending on the state they live in. In Iowa, a brand new curriculum has been put into use early in 2007. The new curriculum reflects the most recent changes in the Dietary Guidelines for Americans and the creation of MyPyramid (United States Department of Agriculture and United States Department of Health and Human Services, 2005; United States Department of Agriculture, 2005).

The following research project was designed to examine the effectiveness of the new EFNEP and FSNE curriculum compared to the previous curriculum used in the state of Iowa. Demographics, information on dietary intake, and food and nutrition related behaviors were examined from graduates of the program using both the old and the new curricula. The new curriculum was examined even further to determine specific factors that influence participant
behavior change such as instructional setting, participant and educator race, and years of experience of the educator. This was done using the same participant information just described in addition to structured observations of the new curriculum being taught and focus groups with program graduates.

Objectives

The objectives of this research project were to:

1. Determine the effectiveness of the new EFNEP and FSNE curriculum in promoting increased food- and nutrition-related behavior change of program graduates compared with the previous curriculum.
2. Determine factors influencing participant food- and nutrition-related behavior change.

Thesis Organization

The following thesis begins with a review of the literature related to EFNEP, FSNE, and evaluation of these programs. Next, there is a description of the methods used in this research project. Following the methods are two manuscripts presenting the qualitative and quantitative results of this research project. General conclusions and future directions for research are presented after the manuscripts. This thesis concludes with acknowledgements.
CHAPTER II: REVIEW OF LITERATURE

Low-Income Families

Low-income families in America face economic hardships each day. The 2005 census determined that 12.6 percent of people in the United States (U.S.) were living in poverty (DeNavas-Walt, Proctor, Lee, 2006), including 7.7 million family members, or 9.9 percent of families. Families led by single mothers are more likely to experience poverty, 28.7 percent of these families lived in poverty. Poverty is defined by the U.S. Census Bureau (2007) as an income less than the poverty threshold for that person or family. The poverty thresholds are income levels set by the U.S. Census Bureau that include cost of living for a person or family and number of family members, which are adjusted annually for inflation. Programs that use income as an eligibility requirement, such as the Food Stamp Program and the Special Supplemental Nutrition Program for Women, Infants, and Children, use a simplified version of the poverty thresholds, the poverty guidelines, to determine whether or not a person or family qualifies for their program. The 2007 Poverty Guidelines for annual income are shown in Table 1 (United States Department of Health and Human Services [HHS], 2007).

America’s Second Harvest (2007), a nationwide network of food banks, reports that 36.9 million Americans lived in poverty in 2005, 35.2 million were food insecure, and 25.3 million received emergency food assistance. The definition of food insecurity used by America’s Second Harvest is, “limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways.” They (2006) also report that 68 percent of people receiving emergency food assistance were below the federal poverty level, 83 percent had an income ≤185 percent of the Federal Poverty Guidelines, and 70 percent were food insecure in 2005.

Economic hardships can lead to physical hardships, which impact health status. The National Center for Health Statistics (2005) reported those who are poor or near poor have higher rates of hypertension, high cholesterol, overweight (adults and children), and physical inactivity compared to the non-poor. The Centers for Disease Control and Prevention (2006) also report that, as income increases from less than $15,000 per year to greater than $50,000
per year, the prevalence of diabetes, hypertension, and inactivity decrease and lack of health care coverage also decreases.

<table>
<thead>
<tr>
<th>Persons in Family or Household</th>
<th>48 Contiguous States and D.C.</th>
<th>Alaska</th>
<th>Hawaii</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$10,210</td>
<td>$12,770</td>
<td>$11,750</td>
</tr>
<tr>
<td>2</td>
<td>13,690</td>
<td>17,120</td>
<td>15,750</td>
</tr>
<tr>
<td>3</td>
<td>17,170</td>
<td>21,470</td>
<td>19,750</td>
</tr>
<tr>
<td>4</td>
<td>20,650</td>
<td>25,820</td>
<td>23,750</td>
</tr>
<tr>
<td>5</td>
<td>24,130</td>
<td>30,170</td>
<td>27,750</td>
</tr>
<tr>
<td>6</td>
<td>27,610</td>
<td>34,520</td>
<td>31,750</td>
</tr>
<tr>
<td>7</td>
<td>31,090</td>
<td>38,870</td>
<td>35,750</td>
</tr>
<tr>
<td>8</td>
<td>34,570</td>
<td>43,220</td>
<td>39,750</td>
</tr>
<tr>
<td>For each additional person, add</td>
<td>3,480</td>
<td>4,350</td>
<td>4,000</td>
</tr>
</tbody>
</table>

Census data of 2005 revealed over one-quarter of single mothers lived in poverty (DeNavas-Walt, Proctor, Lee, 2006), which instigated further examination of this high risk population. Wharf-Higgins and colleagues (2006) reported that limited income of mothers caused them to experience increased stress leading to physical illness, depression, and habits detrimental to their health. In this focus group setting, mothers shared that finances were a barrier to becoming healthier, especially in relation to exercise and nutrition. Exercise classes or attending recreational facilities were too costly and walking was viewed as not safe in the neighborhoods they lived in. Regarding adequate nutrition, many shared they did not have enough money to purchase nutritious foods and the food received from food banks was not nutritious.

Poverty status also has detrimental effects on children. Children from food insufficient families are more likely to have a low birth weight, overweight or obese mothers, lower socioeconomic status, and a higher body mass index (Dubois, Farmer, Girard, and Porcherie, 2006). This longitudinal study demonstrated that food insufficiency, measured by
a questionnaire adapted from the U.S. Household Food Security Scale, doubled the odds of overweight among preschoolers regardless of their birth weight classification (low, normal, or high). Bauman, Silver, and Stein (2006) suggest that three family characteristics significantly impact child health – poverty, parent educational status (high school graduate or below), and single parent homes. Each additional characteristic significantly increased the odds ratio of having a chronic health condition, 1.25 with one characteristic, 1.60 with two, and 2.11 with all three. Poverty was the characteristic with the strongest influence on overall health.

Individuals with limited income often do not have access to health information and health care, leading to increased risk of acute and chronic diseases and their related complications. A number of federal assistance programs exist to aid this population. For assistance in purchasing groceries, the Food Stamp Program provides financial assistance and the Special Supplemental Nutrition Program for Women, Infants, and Children provides nutrition counseling and vouchers for food to pregnant, breastfeeding, and postpartum women, and infants and children up to five years old. Specifically for children, the National School Meals Program provides free and reduced priced meals for students and Head Start provides school readiness for preschool aged children. Temporary Assistance for Needy Families provides financial assistance and employment opportunities; Medicaid provides financial assistance for medical care. The Expanded Food and Nutrition Education Program (EFNEP) and the Food Stamp Nutrition Education (FSNE) are unique in that they do not provide financial assistance; however, these two programs provide nutrition education, which attempts to provide lifelong in addition to immediate benefits to the family. EFNEP and FSNE seek to help low-income families use the resources currently available to them to prevent nutrition-related health problems in the future.

**Program Background**

In Iowa, EFNEP and FSNE are very similar programs (Table 2). The differences between the programs include the audience served, source of funding, and methods of evaluation. In Iowa, EFNEP is found in highly populated, urban areas whereas FSNE is typically found in rural areas. EFNEP serves only families with young children while FSNE
serves people of all age groups using food stamps, though it concentrates on families with young children in Iowa. FSNE is funded with money from the United States Department of Agriculture (USDA) Food and Nutrition Service (FNS) with equal match from non-federal sources, while EFNEP is funded through the USDA Cooperative State Research, Education, and Extension Service (CSREES). Evaluation is consistent across all EFNEP programs nationally, but not for all FSNE programs, though in Iowa part of FSNE is evaluated in the same way as EFNEP. In Iowa, both programs teach nutrition information to as many eligible people as possible using the same curriculum. An individual is eligible if their income is ≤ 185 percent of the Federal Poverty Guidelines (Table 3) and is the parent or guardian of at least one child ≤ 10 years of age or an expectant parent. Much of the following discussion focuses on EFNEP because the majority of published research and evaluation is on EFNEP rather than FSNE due to the longer existence and more consistent evaluation of EFNEP.

<table>
<thead>
<tr>
<th>Table 2. EFNEP and FSNE Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Income</strong></td>
</tr>
<tr>
<td><strong>Family type</strong></td>
</tr>
<tr>
<td><strong>Funding</strong></td>
</tr>
<tr>
<td><strong>Curriculum</strong></td>
</tr>
<tr>
<td><strong>Evaluation</strong></td>
</tr>
</tbody>
</table>

EFNEP is a federally funded program that strives to improve the health of low-income families through experiential learning (USDA CSREES, 2006). EFNEP was funded throughout the U.S. after a pilot program in the state of Alabama demonstrated the benefits of in-home instruction to homemakers on financial management, nutrition, housing, and child development (Oliver, 1967). EFNEP reaches both adults and youth; adults are taught either in a group or individual setting whereas youth are typically taught in a group setting such as school or an after-school program.

This program consists of a series of lessons taught by paraprofessionals, referred to as program assistants or PA’s in Iowa. PA’s are members of the community they serve and many are presently or have been at the same socio-economic status as the program participants (Brink, 2000). These commonalities with program participants facilitate the
ability to establish rapport and effective communication. Paraprofessional educators have been effective in a number of settings including reducing risk of contracting HIV (Dilley, et al., 2007), improving child care knowledge and involvement (Barlow, et al., 2006), and increasing literacy (Dowrick and Yuen, 2006).

<table>
<thead>
<tr>
<th>Persons in Family or Household</th>
<th>Annual Income</th>
<th>Monthly Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$18,889</td>
<td>$1,575</td>
</tr>
<tr>
<td>2</td>
<td>25,327</td>
<td>2,111</td>
</tr>
<tr>
<td>3</td>
<td>31,765</td>
<td>2,648</td>
</tr>
<tr>
<td>4</td>
<td>38,203</td>
<td>3,184</td>
</tr>
<tr>
<td>5</td>
<td>44,641</td>
<td>3,721</td>
</tr>
<tr>
<td>6</td>
<td>51,079</td>
<td>4,257</td>
</tr>
<tr>
<td>7</td>
<td>57,517</td>
<td>4,794</td>
</tr>
<tr>
<td>8</td>
<td>63,955</td>
<td>5,330</td>
</tr>
<tr>
<td>For each additional person, add</td>
<td>6,438</td>
<td>537</td>
</tr>
</tbody>
</table>

*Adapted from United States Department of Agriculture, 2007

Wakou, Keim, and Williams (2003) surveyed 34 state- and county-level EFNEP professionals from 14 states and one U.S. territory to explore traits and competencies of successful PA’s. EFNEP professionals completed a three round survey process in which they first answered open-ended questions about personality traits and professional competencies of PA’s and, in the second and third rounds, ranked the traits and competencies gathered from the first round from most to least important. Personality traits receiving high rankings included dependable or reliable, honest or trustworthy, good interpersonal skills, respectful, confidential, and non-judgmental. Professional competencies considered desirable prior to hiring a PA were the ability to work with people, teachability, confidential, follows directions, and good communication skills. Professional competencies desired after training a PA included knowledge and understanding of the target audience, knowledge of the role
and limitations of the program, communication skills, good interpersonal skills, and positive attitude. PA’s with these traits may be more able to develop a close relationship with program participants, and; therefore, be more successful in their teaching. PA perceptions about the content they teach may also influence the success of their teaching. Dickin and colleagues (2005) report that participants achieving the greatest behavior change from entry to exit from the program were taught by PA’s with a more positive perception of the value of the program. These findings suggest that personal characteristics and attitudes of the educator are related to the effectiveness of the program.

**Program Curriculum**

The EFNEP curriculum varies from state to state; however, commonalities of the curricula include basic nutrition information, food preparation skills, shopping skills, food safety, and sanitation (Montgomery and Willis, 2005). Some states choose to teach technical information such as functions and sources of individual macro- and micro-nutrients while other states choose to keep the information more general. Nationwide in 2005, over 94,000 adults graduated from EFNEP after participating in an average of 8.5 lessons. Each lesson was approximately one hour in length and sessions were completed in a couple days to several months (Montgomery and Willis, 2005). The majority of graduates (81%) were taught in a group of two or more, while the remaining participants were taught individually or in both a group and individual setting.

States routinely modify and update existing curricula and develop new curricula to reflect the most current nutrition and health guidelines. The most recent example of this is the release of the 2005 Dietary Guidelines for Americans (DGA) and the creation of MyPyramid (USDA and DHHS, 2005; USDA, 2005). In response to these new federal nutrition and health guidelines, the states of Colorado and California developed a new EFNEP curriculum, Eating Smart • Being Active (ESBA), which has been piloted in Colorado, California, Iowa, and South Carolina.

The DGA were created to help Americans improve their health and reduce the risk of chronic diseases through diet and physical activity (USDA and HHS, 2005). Using the most current nutrition-related scientific research and information, the DGA committee of experts
formulated recommendations for general and specific groups of the population. From early nutrition recommendations through the current revision of the DGA, the themes of variety, proportionality, and moderation remain constant (Welsh, 1994).

To graphically represent the DGA, MyPyramid was created. MyPyramid was designed to help Americans make healthy food choices and be physically active. The development of MyPyramid began by determining the appropriate number of servings from each food group and subgroup (whole grains, starchy vegetables, dark-green vegetables, etc.) for each calorie level using the Dietary Reference Intakes and DGA (Britten, Marcoe, Yamini, and Davis, 2006). Next, a series of consumer research studies were conducted to determine the DGA recommendations MyPyramid should convey (physical activity, variety, whole grain consumption, etc.) (Britten, Haven, and Davis, 2006) and the desirable graphics and slogans to represent MyPyramid (Haven, Burns, Britten, and Davis, 2006). Components of the DGA and MyPyramid have been incorporated into the new curriculum such that the program participants receive the most current and accurate nutrition information in an appropriate manner for this audience.

EFNEP and FSNE strive to create nutrition-related behavior changes in participants consistent with the DGA. Each ESBA lesson includes objectives to promote behavior change and the content reflects information pertinent for behavior change to occur. Hersey and others (2001) identified food shopping practices as an appropriate target behavior for EFNEP and FSNE audiences because shopping practices influence diet quality and the amount of money spent on food. Food shopping practices addressed by ESBA include reading Nutrition Facts labels, using a grocery list, planning meals, purchasing foods on sale, and comparing prices. EFNEP participants reporting better shopping practices had better dietary intakes of nutrients such as vitamins A and C. Medeiros, Hillers, Kendall, and Mason (2001) recommend that nutrition education curricula contain food safety information addressing personal hygiene, thorough cooking, cross-contamination, temperature abuse, and unsafe food. Including food safety information may decrease the incidence of food-borne illnesses originating in the home. Food safety practices addressed by ESBA include hand-washing, cooking and storing at proper temperatures, cleaning food preparation surfaces, and food safety practices.
Creation and implementation of a new curriculum requires evaluation and review to ensure program objectives are met. Program objectives inform the measurement tool to be used in program evaluation and ultimately the effectiveness of the program. Effectiveness is the ability to meet program objectives, thus data collected in the evaluation process must match the program objectives. For example, an objective of EFNEP and FSNE is to promote nutrition-related behavior change; collecting information on food choices and nutrient intake reflect behavior change whereas knowledge of nutrition principles would not.

Each nutrition education program conducts evaluation using different methods depending on the objectives of the program. Contento, Randell, and Basch (2002) conducted a review of nutrition education evaluations and found that methods of evaluation included surveys of nutrition knowledge, attitudes, behaviors, and preferences; determination of dietary intake through 24-hour recalls, three day food records, observations of food choices, and food frequency questionnaires; and physiological measures such as blood lipid levels, body mass index, and blood pressure. EFNEP and FSNE in Iowa focus on evaluating behavior change and collect data on demographics and family composition, pre- and post-program 24-hour recalls, and pre- and post-program food behavior questionnaires.

Every evaluation is dependant on accurate, reliable data; methods of data collection must be valid. The validity of the 24-hour recall has been examined by Karvetti and Knuts (1985) who report greater validity of the 24-hour recall in women, the most common participants in EFNEP and FSNE. Common problems with the collection of 24-hour recalls include individuals tending to underreport their energy intake and the inability to reflect day to day variation in the intake of an individual (Johnson, Soultanakis, and Matthews, 1998). Despite these problems, collection of dietary intake information through 24-hour recalls is still commonly used because it is low in cost and quick and easy to administer.

The food behavior questionnaires used by EFNEP and FSNE were created by a national group of stakeholders in EFNEP (Anliker, Willis, and Montgomery, 2004). Program representatives from all states completed a questionnaire and supplied information on current food behavior checklist items. An initial checklist was designed and distributed to state program directors who provided feedback on the instrument. A revised checklist was created and focus group discussions among the EFNEP target audience were conducted to collect
feedback on the interpretation of the checklist questions. Following the focus groups, seven state programs pilot tested the checklist. This testing was deemed sufficient to establish the reliability and validity of the instrument, and the food behavior checklist was released for use by all the EFNEP sites in 1996. Murphy, Kaiser, Townsend, and Allen (2001) also established the validity of questions on the food behavior checklist and additional questions using data from three 24-hour recalls and measurement of total serum carotenoids. Swindle and others (2007) examined the usefulness of collecting food behavior checklist data once at pre- and once at post-program versus using a retrospective pre/post checklist once at the end of the program. Though it was hypothesized that the retrospective pre/post checklist would be more accurate by limiting response shift bias, there were no significant differences between the two methods.

**Theories and Approach to Education**

Education and learning have been examined for centuries. In order to understand and explain learning, researchers have developed a number learning theories. Each researcher of learning and learning theories define learning differently, though Merriam and Caffarella (1999) describe it as “an experience that causes a change in behavior.” Learning theories provide explanations for what learning is, what the purpose of learning is, why learning occurs, what causes learning to occur, the best environment for learning, and the roles of educators. Educational programs use learning theories and often combine various components of different learning theories to create curriculum. Using learning theories to create curricula optimizes the change in behavior for the intended audience. The new curriculum developed and implemented for this project was based on the adult learning theory, social learning theory, and experiential learning.

**Adult Learning Theory**

Adult learning theory was described by Rossman (1973) as: 1) identifying a need, 2) putting forth effort to meet that need, and 3) satisfaction of the need. Figure 1 is a visual adaptation of the description by Rossman of the adult learning theory. The ESBA curriculum includes activities to identify a need. For example, open-ended questions asked by PA’s
encourage participants to explore aspects of the diet of their families that could improve. Participants also set goals for themselves, encouraging them to focus what they learn and use from the program (Amstutz, 1999). Effort put forth to meet the need can also be found in several aspects of ESBA. First, participants make the commitment to attend eight sessions. Participants also work together in small groups of two or more to solve problems and conduct discussions related to the needs they have identified (Tweedell, 2000). Group interaction brings the knowledge and skills of participants together to help everyone learn new information and skills to take home and use (Imel, 1999). In this setting, the instructor is less of a lecturer and more of a facilitator of the group learning. Finally, the setting of the program is comfortable and supportive for the participants to facilitate their learning. The last component of adult learning theory described by Rossman (1973) is satisfaction of the need, which is ultimately the result of the effort put forth by the participant.

**Figure 1. Adult Learning Theory.**

<table>
<thead>
<tr>
<th>Need – the adult will learn once a need has been identified</th>
<th>Effort – effort is expended in order to satisfy the need</th>
<th>Satisfaction – the need is satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need – the family needs to save money while shopping for food</td>
<td>Effort – mother goes to EFNEP lessons and learns more efficient shopping practices</td>
<td>Satisfaction – the family saves money while shopping for food</td>
</tr>
</tbody>
</table>

**Social Learning Theory**

Social learning theory proposes that people can learn new skills and behaviors from observing others perform the skill or behavior (Bandura, 1977), and is another learning theory used in the ESBA curriculum. This theory purports that individuals will most likely imitate behaviors of those they perceive as role models if they: 1) think they will be able to perform the behavior; 2) can relate to the situation or the role model; and 3) perceive outcomes of the behavior are valuable. The social learning theory has been applied to many
health behavior programs including: 1) increasing child fruit and vegetable consumption (Spoon, Benedict, Leontos, and Krelle-Zepponi, 1998); 2) reducing substance abuse (Martin, Froelicher, and Miller, 2000; Ramos and Perkins, 2006); 3) reducing the risk of cancer (Braun, Fong, Kaanoi, Kamaka, and Gotay, 2005; Navarro, 1998); 4) reducing the risk of contracting HIV (James, Gillies, and Bignell, 1998; Rotheram-Borus et al., 2003; St. Lawrence, Wilson, Eldridge, Brasfield, O’Bannon, 2001); and, 5) obesity prevention for Native American children (Davis et al., 2003). Clearly, social learning theory can be effectively used in a variety of interventions to promote behavior change. In the ESBA curriculum, the PA is the role model for program participants. The PA demonstrates behaviors such as food preparation, reading food labels, making shopping lists, performing physical activity, and using safe food practices. The curriculum also allows time for the learners to practice these behaviors along with the educator.

Experiential Learning

Experiential learning was introduced by Dewey (1938) who proposed it was best to put learners into real life situations to learn from these experiences and then apply what was learned to their own life. When teaching scientific information, such as nutrition, Dewey recommends teaching it in the context of everyday life. As with the adult learning theory, the educator becomes a facilitator of group activities and experiences. Experiential learning has been used in many situations recently including: 1) professional development (Morrison and Estes, 2007); 2) higher education (DiCecco, Wu, Kuwasawa, and Sun, 2007; Osman and Halime, 2007; Teranishi, 2007); 3) student internship programs (Orkow, 2007); 4) recycling programs (Harris and Harris, 2007); and, 5) programs to help children cope and solve problems (Brendtro and Strother, 2007; Mitchell and McCall, 2007). The ESBA curriculum provides experiences and practical information that the participants can use in their everyday lives; for example, PA’s and participants prepare recipes and perform physical activities together that can easily be done by the participant in their home.
Learner-Centered Approach

The ESBA curriculum also incorporated a learner-centered approach to nutrition education. The learner-centered approach to education leverages the learners’ experiences, interests, talents, and needs to facilitate learning (Henson, 2003). In the learner-centered approach, an educator: 1) bases education on the experiences of the learner; 2) considers the characteristics of the learner when designing the education program; 3) considers the perceptions of the learner when designing the education program; 4) nurtures the curiosity of the learner; 5) involves the emotions of the learner; and, 6) creates a learning environment free of fear. FSNE educators in California using learner-centered education reported that they were doing “okay” or “very well;” however, lack of space and time, and difficulty managing group situations presented challenges (Kaiser, McMurdo, and Joy, 2007). They also reported that not all techniques worked in all situations and planning was needed to be successful in learner-centered education. Yet, use of the learner-centered approach can help EFNEP and FSNE identify and appropriately meet the needs of the program participants.

The Iowa EFNEP and FSNE have received training on the learner-centered approach using strategies described by Norris (2003). These strategies include:

1) Setting the stage for learning by making the learning environment attractive with colored table cloths or flowers, playing music and welcoming the participants as they come in, and being prepared with all the materials the participants will need.

2) Activating prior learning by connecting the topic to be discussed with something the participants are familiar with such as a favorite childhood food.

3) Teaching to a variety of learning styles by incorporating teaching methods that suit every learning style – pictures for visual learners, hands-on activities for kinesthetic learners, and discussion for auditory learners.

4) Asking open-ended questions to make participants think deeply about the topic by asking questions that start with how, why, or tell me more.
5) Putting participants into partnerships to discuss a question, this will help participants get to know each other and allow participants who would not share in front of the entire group a chance to share their ideas.

6) Reinforcing the learning so it is not lost by doing a closing activity that reminds participants of what they learned.

The Iowa EFNEP and FSNE experienced similar problems using the learner-centered approach to the California FSNE (Kaiser, McMurdo, and Joy, 2007); however, the ESBA lesson plans were written to maximize the space and time available to teach the lessons in a group setting. Thus, it is possible that use of the learner-centered approach in a group will be more effective in Iowa.

**Cooperative Learning**

Lastly, the learning environment of the Iowa EFNEP and FSNE is a cooperative learning environment. Johnson, Johnson, and Smith (1991) describe the cooperative learning environment as one in which educators and learners work together as opposed to individually or competitively. The cooperative learning environment is similar to the environment described in the learner-centered approach, everyone benefits from the knowledge and experiences of others through the sharing of information. In EFNEP and FSNE, each person brings their own experiences and knowledge and the lessons provide time and activities to promote sharing of this between group members and between the PA and the participants. Benefits from cooperative learning include increased motivation to learn, increased transfer of knowledge, increased productivity, development of critical thinking skills, a positive attitude toward the subject matter, and development of close relationships between group members and the instructor and the learners (Johnson, Johnson, and Smith, 1991).

The combination of adult learning theory, social learning theory, experiential learning, learner-centered approach, and cooperative learning provides a curriculum and learning environment that can effectively communicate nutrition information to its audience. The various components of each theory and approach to learning complement each other. Figure 2 displays each theory and approach used in the current project to facilitate the learning of the EFNEP and FSNE participants.
Figure 2. Learning Theories and Approaches Used by EFNEP and FSNE

<table>
<thead>
<tr>
<th>Theory/Approach to Learning</th>
<th>Components Used</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adult Learning Theory</strong></td>
<td>Small group work and discussions</td>
</tr>
<tr>
<td>(Tweedell, 2000; Imel, 1999; Amstutz, 1999)</td>
<td>Goal setting</td>
</tr>
<tr>
<td></td>
<td>Instructor acts as a facilitator</td>
</tr>
<tr>
<td></td>
<td>Comfortable and supportive environment</td>
</tr>
<tr>
<td><strong>Social Learning Theory</strong></td>
<td>Learning new skills and behaviors by watching others</td>
</tr>
<tr>
<td>(Bandura, 1977)</td>
<td>Imitation of the behavior of a role model</td>
</tr>
<tr>
<td><strong>Experiential Learning Theory</strong></td>
<td>Learning in real life situations</td>
</tr>
<tr>
<td>(Dewey, 1938)</td>
<td>Application of learning to the participant’s own life</td>
</tr>
<tr>
<td></td>
<td>Instructor acts as a facilitator</td>
</tr>
<tr>
<td><strong>Learner Centered Approach</strong></td>
<td>Education based on experiences and characteristics of the learner</td>
</tr>
<tr>
<td>(Norris, 2003)</td>
<td>Comfortable and supportive environment</td>
</tr>
<tr>
<td></td>
<td>Ask open-ended questions</td>
</tr>
<tr>
<td></td>
<td>Form partnerships</td>
</tr>
<tr>
<td></td>
<td>Reinforce learning</td>
</tr>
<tr>
<td><strong>Cooperative Learning</strong></td>
<td>Educators and learners work together</td>
</tr>
<tr>
<td>(Johnson, Johnson, and Smith, 1991)</td>
<td>Learning from each other through discussion</td>
</tr>
</tbody>
</table>

**Group versus Individual Instruction**

At the beginning of EFNEP and FSNE, nutrition education was typically taught on a one-on-one basis (Brink, 2000). Over time, the setting has changed from individual to groups. Some states now use only group settings while others use individual, group, or a combination of both. The state of Iowa falls into the latter, using a combination of individual and group instruction.

Previous research by Luccia and colleagues (2003) suggests that significant changes in dietary behavior were independent of the setting of the instruction (group versus individual), supporting the decision of the Iowa EFNEP and FSNE to use both instructional settings. Unfortunately, these results have not been confirmed by others (Cason, Scholl, Kassab, 2002; Dickin, Dollahite, Habicht, 2005; Dollahite and Scott-Pierce, 2003). Dollahite and Scott-Pierce (2003) reported that, although behavior of all participants improved from
the beginning to the end of the program, participants in the individual setting had significantly greater improvement in food- and nutrition-related behaviors than participants in the group setting. These differences may have been due to demographic differences between those taught individually versus in groups; individual participants were more likely to be from rural areas while group participants were more likely from urban areas. Similarly, Dickin, Dollahite, and Habicht (2005) and Cason, Scholl, and Kassab (2002) found that the individual setting resulted in greater improvement in behavior than the group setting. They reported that participants in the individual setting showed significantly greater improvements in number of meals eaten, servings from the milk and fruit groups, calcium, vitamin A, vitamin C, vitamin B₆, and food- and nutrition-related behaviors such as meal planning, comparing prices, and food safety.

In contrast to the previous studies, Reio and Sanders-Reio (2005) suggest that low-income adult learners, similar to those in the EFNEP and FSNE, may respond more favorably to the group setting. Those who were able to form relationships with others in a learning setting had a more positive attitude, were more curious, and reported the program more successful. However, this does not necessarily mean more knowledge was gained or behavior change occurred.

Other methods of lesson delivery for EFNEP and FSNE have also been examined. EFNEP and FSNE lessons taught in a group setting with an educator present or individually via videotape have been implemented to save time and money (Cox, White, and Gaylord, 2003). Both groups (group setting and individual videotape) significantly increased intake of fruit, calcium, vitamin A, and vitamin C from entry to exit from the program; the individual videotape group also significantly increased intake of fiber. Both groups received a significantly better total score on the food behavior questionnaire; however, there were no significant differences between the two groups of program graduates in either their dietary intakes or food behavior questionnaires.

Small groups, television, mobile exhibit, and one-on-one using a curriculum or an individualized approach have also been examined. Rana and Schuler (1984) suggest each of the delivery methods were successful in producing knowledge and behavior change with the one-on-one using a curriculum being the most successful.
Many instructional settings for EFNEP and FSNE have been examined to determine which is the most effective at facilitating behavior change in participants. The one-on-one setting, group setting, videotapes, television, and mobile exhibits all successfully produced a behavior change; however, findings suggest the one-on-one method is most effective. Further investigation of this issue is warranted with the new ESBA curriculum, particularly since the learning theories and approaches used in the new curriculum support education in a group setting.

**Program Audience**

Participants of EFNEP and FSNE may be considered low-skilled learners. Illeris (2006) defines low-skilled learners as those who did not do well in school or did not receive much formal education. They often have negative attitudes and feelings toward organized education because of the experiences they have had in the past with education; a feeling of humiliation experienced in the public school system is carried to other educational settings. To overcome these feelings, it is necessary for adult education programs such as EFNEP and FSNE to create a learning environment that offers something the learner needs and can be enthusiastic about, is free of any circumstances that might be felt as humiliating, and is respectful. EFNEP and FSNE participants are commonly parents and women, some living in poverty in addition to being low-skilled learners.

EFNEP and FSNE participants are primarily adult parents, they are responsible for themselves and their families. Thus, they must take responsibility for what they are learning and the educator must encourage the learner to take responsibility. Parents are constantly learning and require a supportive environment and motivation to learn (Marienau and Segal, 2006). Educators need to help parents learn from their experiences in order to gain new knowledge and change behaviors. A group environment can aid the learning of parents by allowing them to share experiences and learn from each other. Illeris (2006) calls for investment in education programs and educators that can provide a positive environment to encourage participation and learning among all low-skilled learners.

Many situations of women in the home put these adult learners at a disadvantage compared to men (Gouthro, 2005). Unequal division of chores in the home and lack of
support from family may discourage women from taking advantage of educational opportunities. On the other hand, supportive relationships at home encourage women seeking educational opportunities. A major activity of women in the home is being a mother (Gouthro, 2005). Mothers are expected to support and care for their children and their home; however, participating in educational opportunities decreases the time available for this activity. Mothers who have been able to balance their activities at home with their educational activities feel they set a good example for their children (Gouthro, 2005), and those who report spending as much time as possible with their children and involving their children in educational activities have academically successful children (Milne and Plourde, 2006). They also report feeling responsible not only for their own behavior but also for the behavior of their children (Gouthro, 2005). Because of the influences of mothers on their families, the EFNEP and FSNE are able to promote the health of the entire family by recruiting mothers as participants.

Research on poverty and the adult learner suggests there are a number of problems experienced by those living in poverty that an educator must understand to engage a participant in any learning program (Brown, 2005). These problems include feelings of rejection, deprivation, stress, and stigma attached to being poor. Singleton (1994) recommends that nutrition educators keep in mind all these problems in order to be effective. The EFNEP and FSNE attempt to meet the needs of adult learners living in poverty by incorporating theoretical approaches described previously and the use of PA’s as educators. The adult learning theory and the learner-centered approach to learning both recommend a learning environment that is comfortable and non-threatening for the participant. In the case of EFNEP and FSNE, the environment is usually the home of the participant or a community building they frequently visit (Tweedell, 2000; Imel, 1999; Amstutz, 1999; Norris, 2003). Sharing and learning from each other, which encourages a sense of belonging and displaces feelings of rejection, are incorporated in the ESBA curriculum and are a common thread to each of the learning theories and approaches to learning discussed earlier (Johnson, Johnson, and Smith, 1991; Bandura, 1977; Dewey, 1938). Finally, many PA’s have lived in poverty, thus can understand participant feelings and problems, and help them overcome these
challenges. PA’s act as facilitators of the discussion rather than teachers to make the participants feel more comfortable.

Ultimately, when the needs of the adult learner are met, they are able to learn and make behavior changes. Adult education courses have had positive effects on the health of their participants including decreased smoking and increased exercise as well as increased participation in the community (Feinstein and Hammond, 2004). This suggests that individuals can continue to learn and change their behaviors throughout their lives. Therefore, programs such as the EFNEP and FSNE can be beneficial to adults, yet program evaluation is necessary to document these benefits and secure the necessary funding for the future of the program.

Evaluation, a common element of educational programs, is used to determine learning that takes place and changes in behavior. For the low-skilled learner, who has likely had bad experiences with evaluation conducted by exams, use of non-threatening evaluation tools that are supportive of the learner is important (Illeris, 2006).

**Quantitative Program Evaluation**

Quantitative evaluation uses numerical data to examine the characteristics of a sample of a population and then generalize these characteristics to the entire audience (Brannen, 1992; Ercikan and Roth, 2006). Quantitative evaluation of EFNEP and FSNE has been in existence since their inception. The following discussion describes a variety of quantitative studies of the EFNEP and FSNE conducted in a variety of geographic locations.

Many of the quantitative studies of the EFNEP and FSNE examine food and nutrient intakes. Del Tredici and colleagues (1988) demonstrated significantly higher intakes of milk, meat, and fruits and vegetables among program graduates compared to non-participant controls six months after program completion. Amstutz and Dixon (1986) and Romero and others (1988) reported that EFNEP participants had significantly higher intakes of milk, meat, fruit and vegetable, and bread and cereal food groups at graduation compared to entry into the program. Similar results were found by Torisky and colleagues (1989) with the exception that meat consumption did not change. Others (Arnold and Sobal, 2000; Brink and Sobal, 1994) have examined nutrient intakes rather than food groups. A decrease in fat and
an increase in vitamin A intakes (Brink and Sobal, 1994) and an increase in vitamin C, fiber, and folate intakes (Arnold and Sobal, 2000) from program entry to exit have been reported. Cason and colleagues (2004) examined both food groups and nutrient intakes; significant increases in servings from all food groups and intakes of iron, calcium, vitamin A, vitamin C, and dietary fiber from entry to exit from the program were observed. Similar results were found in a group of EFNEP participants compared to a demographically similar group of non-participants (Burney and Haughton, 2002); those who participated in the program improved their intake of meat, dairy, fruit, vegetables, grains, iron, calcium, vitamin C, vitamin B₆, and iron.

Other quantitative studies of the EFNEP and FSNE have examined food- and nutrition-related behaviors. Murphy and colleagues (1980) created a tool to assess food storage and safety, kitchen sanitation, and food money management practices among program participants as they progressed through the program. No significant improvement in these practices was observed throughout enrollment in the program; however, a trend toward improved practices was noted. Brink and Sobal (1994) and Arnold and Sobal (2000) reported significant improvements in ten food- and nutrition-related behaviors among participants from entry to graduation, and at follow-up one year after graduation of the program. Some of the behaviors evaluated included reducing fat in cooking, not thawing foods at room temperature, comparing food prices while shopping, and eating breakfast. Other studies suggest fewer improvements in food- and nutrition-related behaviors. Cason and colleagues (2004) report significant improvements in two behaviors - planning meals ahead of time and using the Nutrition Facts panel to make food choices. Burney and Haughton (2002) report program participants were better able to manage their financial resources by planning meals in advance, comparing prices, and using a shopping list. Similarly, Romero and others (1988) reported significant improvement only in participant food shopping practices.

Some quantitative studies of the EFNEP and FSNE have examined food- and nutrition-related knowledge. Nutrition knowledge gained from program participation was the only variable associated with increased intakes from food groups in a regression model that included program characteristics such as number and length of lessons, shopping
behaviors, cooking behaviors, economic behaviors, food safety behaviors, food preservation behaviors, and attitudes about food (Del Tredici, Joy, Omelich, and Laughlin, 1988). Multiple studies report participants experience significant improvements in knowledge about the food groups from program participation (Anderson, 1988; Arnold and Sobal, 2000; Brink and Sobal, 1994; Romero, Medeiros, and Melcher, 1988). Specifically, Anderson (1988) found significant improvements in knowledge about nutritious snacks, the importance of breakfast, food budgeting, and food safety. Brink and Sobal (1994) and Arnold and Sobal (2000) reported significant improvements in knowledge about foods rich in specific nutrients.

Participation in the EFNEP and FSNE can benefit smaller subgroups of the target audience. In Oklahoma, pregnant adolescents were recruited into EFNEP to prevent low birth weight infants by encouraging normal weight gain throughout pregnancy (Herman, Williams, and Hunt, 2001). All participants with low intakes from the grain, vegetable, fruit, milk, and meat groups at entry into the program significantly increased their intakes by graduation. The rate of low birth weight infants born to participants (4.5 percent) was lower than the overall rate for the state of Oklahoma (11.8 percent); only 7.4 percent gained less than 21 pounds during their pregnancy decreasing the risk for low birth weight infants.

Evaluation of EFNEP has also been conducted using a cost-benefit analysis, which examines effectiveness of a program relative to financial investment. Warner and Luce (1982) define cost benefit analysis as weighing all of the pros and cons of a decision (i.e. implementation of a program) in monetary terms. The state of Virginia conducted the first cost-benefit analysis of the EFNEP (Rajgopal, Cox, Lambur, and Lewis, 2002). Costs of the program such as salaries, office related costs, training, and travel were compared to the potential amount of money saved on healthcare costs, the primary benefit of the program. It was determined that, for each dollar spent on this program, $10.64 in healthcare savings occurred for the participants. Oregon and Iowa EFNEP programs also conducted a cost-benefit analysis using the same techniques as the Virginia analysis (Schuster, et al., 2003; Wessman, Betterley, and Jensen, 2000). Oregon EFNEP found that, for every dollar spent, $3.63 in savings occurred; Iowa EFNEP found that, for every dollar spent between 1998 and 2000, $10.75 in savings occurred and in 2002 $8.03 in savings occurred (addendum). The Tennessee EFNEP conducted a similar cost-benefit analysis (Burney and Haughton, 2002),
which compared the costs of the program to the benefit of money saved while purchasing food. For every dollar spent by the program, $2.48 in food cost savings occurred for the participants.

These studies clearly demonstrate that EFNEP and FSNE can improve food and nutrition knowledge and behavior; however, these results have been shown mostly in the East and West regions of the nation. Thus, it is important to gain more information about the effectiveness of these programs in the Midwest region.

**Qualitative Program Evaluation**

Qualitative evaluation of the EFNEP and FSNE has also been conducted, though not extensively. Qualitative evaluation generates rich descriptions of a sample of the population and then uses inductive analysis to categorize these descriptions into common themes or concepts (Brannen, 1992; Ercikan and Roth, 2006; Thomas, 2006). Qualitative data can be collected using interviews, observations, focus groups, and existing data sources such as personal journals (Mason, 2002). All of these sources of qualitative data could be collected from EFNEP and FSNE; however, only interviews and focus groups have been used to date.

Devine and colleagues (2006) conducted interviews among current and past program participants to explore perceived benefits from participating in EFNEP and FSNE and how they experienced those benefits. Many benefits desired from the program were identified in participant lives such as increased knowledge about foods, trying new recipes at home, and setting food- and nutrition-related goals for their family. One year following graduation, interviews of New York EFNEP graduates indicated they thought more about nutrition for their children, improved health, increased intake of fruits, vegetables, whole grains, and low fat foods, and experienced benefits such as improved meal planning, feeling healthy, and increased self-esteem (Arnold and Sobal, 2000). Interviews have also indicated a positive effect on community involvement, health, and nutrition knowledge in program graduates (Brink and Sobal, 1994).

Focus groups to examine motivations and barriers to changing nutrition-related behaviors suggest that motivations included healthful eating for themselves and their families, weight loss, and prevention of nutrition-related chronic diseases such as diabetes
Barriers included lacking the time, money, and knowledge to make nutritious food choices and family preferences, which are not unique to EFNEP (Gatewood, Litchfield, Ryan, Geadelmann, Pendergast, in press; Krummel, Humphries, and Tessaro, 2002).

The amount of qualitative information collected from EFNEP and FSNE is at a minimum, particularly compared to the amount of quantitative data collected. Useful data collection strategies include interviews and focus groups with participants and educators and structured observations of lessons. Qualitative evaluation could be used to examine the effectiveness of different program settings, behavior changes made following graduation, and motivations and barriers to completing the program.

More qualitative data needs to be collected on these programs, but not at the expense of quantitative data. Ercikan and Roth (2006) feel that research questions cannot be completely answered unless quantitative and qualitative data are used together. Vander Wel and colleagues (2005) found this to be true when evaluating a nutrition education program for low-income, middle-aged females. A quantitative survey combined with structured observations and a focus group not only led to the finding that the program was effective, but it also revealed aspects of the program contributing to its effectiveness. Combining qualitative and quantitative data collection can be beneficial; however, it is important to remember to choose data collection methods that are appropriate to the research questions and the situation (Brannen, 1992). Thus, future evaluations of the EFNEP and FSNE should consider including both quantitative and qualitative data.

**Call for Evaluation**

The EFNEP and FSNE have been evaluated periodically throughout their existence; however, these evaluations have taken place in only one state or several counties or cities. Chipman and Kendall (1989) encouraged continuing evaluation of EFNEP so that it could meet the evolving needs of its participants. The United States General Accounting Office recently recommended that nutrition education programs funded by the USDA, including EFNEP and FSNE, conduct more long-term and short-term evaluations across multiple states to provide a comprehensive view of the effectiveness of the programs (United States General
Accounting Office, 2004). In response, the Economic Research Service, Food and Nutrition Service, CSREES, Society for Nutrition Education, and FSNE joined together to improve FSNE evaluation (Guthrie, Stommes, Voichick, 2006). This group identified some key issues that could be evaluated in nutrition education including the best theoretical approach to use, the most effective methods of education delivery, and the number and duration of lessons. In addition, this group began the process of developing a method to measure the outcomes targeted by the nutrition education (Townsend, 2006).

Although evaluation of nutrition education programs is recommended, it is important to recognize some issues that may arise with evaluation. Taylor-Powell (2006) identifies negative and positive points that nutrition educators need to recognize when evaluating a program. Negatives include fears about evaluation from program stakeholders, lack of understanding of evaluation by program stakeholders, the large number of stakeholders involved in nutrition education programs, the variability of programs between levels of government and states, consensus on what to measure, and obtaining data that is valid and reliable. Positives include the fact that nutrition education programs are widely distributed and recognized across the U.S., technology available makes data collection and reporting easier, the field of nutrition has a wide research base that can be useful when developing evaluations, more funding may become available, and program planning and implementation can be improved. With careful thought and planning, evaluations of the EFNEP and FSNE can occur that will provide quality information useful for improving the programs.
CHAPTER III: METHODS

Subjects

Subjects for this research study were voluntary participants and paraprofessional educators (PA’s) of the Iowa Expanded Food and Nutrition Education Program (EFNEP) and the Food Stamp Nutrition Education (FSNE) between April – September 2005, 2006, and 2007. To be eligible to participate in EFNEP and FSNE, an individual must be a parent/guardian of a young child (≤10 years of age) with an income ≤185% of the federal poverty level. All participant subjects were program graduates, requiring the completion of a minimum of eight lessons. Lessons were taught by PA’s in either a small group setting (two or more participants), one-on-one setting, or a combination of both. Many subjects also participated in food assistance programs such as food stamps, the Special Supplemental Nutrition Program for Women, Infants, and Children, and Child Nutrition. All protocols followed during this study were approved by the Iowa State University Human Subjects Review Board. Subjects were given an informational letter describing their rights as a research participant and the research project. Subjects participating in focus groups signed an informed consent document.

Quantitative Data Collection

Subject demographics, family composition, ethnicity, and pregnancy/nursing status were collected using the EFNEP and FSNE enrollment form (Appendix). Dietary intake and food and nutrition related behaviors were collected from 24-hour dietary recalls and food behavior surveys (Appendix), each taken at entry into and exit from the program. Dietary intake and food- and nutrition-related behavior data has previously been used to evaluate EFNEP/FSNE effectiveness (Amstutz and Dixon, 1986; Anderson, 1988; Arnold and Sobal, 2000; Brink and Sobal, 1994; Burney and Haughton, 2002; Cason, Cox, Wenrich, Poole, and Burney, 2004; Del Tredici, Joy, Omelich, and Laughlin, 1988; Murphy, Smiciklas-Wright, Heasley, and Hamilton, 1980; Romero, Medeiros, and Melcher, 1988; Torisky, et. al., 1989). Quantitative data was collected between April 2005 and 2006 and September 2005 and 2006.
(old curriculum) and April 2007 through September 2007 on the new Eating Smart • Being Active (ESBA) curriculum.

24-Hour Dietary Recall

The 24-hour recalls were collected using the multiple pass method (Guenther, DeMaio, Ingwersen, and Berlin, 1997). In this method, the PA first obtains a quick list of foods consumed by the subject in the last 24 hours. Next, the PA reviews the quick list to gather more detailed information about the food consumed (i.e. preparation methods, ingredients used, and brand names) and the amounts consumed. Lastly, the PA reviews the list one last time to verify the information for accuracy and completeness. Key topics taught in the curriculum and power calculations on 2006 program data were used to identify items from the 24-hour recall to be examined in this evaluation. Table 4 illustrates the correlation between key topics from each lesson and the data collected for this evaluation.

Food Behavior Survey

The food behavior survey included the core set of ten food- and nutrition-related behavior questions required of all EFNEP programs. The questions addressed the topics of meal planning, food shopping practices, food safety, and eating breakfast; topics discussed in at least one of the lessons of the ESBA curriculum. All food behavior survey questions were answered using a 5-point Likert scale with one corresponding to never perform the described behavior and five corresponding to almost always perform the behavior.

Qualitative Data Collection

Two methods of qualitative evaluation were used to provide more context and depth to the program evaluation. Structured observations of program lessons and focus groups conducted with program participants of group and individual settings were employed.

Structured Observations

Structured observations were conducted in each county where PA’s were teaching ESBA between May 2007 and August 2007 (n=44). Each of the eight lessons in the ESBA curriculum was represented by the structured observations and both group and individual
settings were observed. The same researcher conducted all of the structured observations using forms similar to those described by Vander Wel and colleagues (2005). An existing form created by the EFNEP and FSNE to guide observations of PA’s while teaching was incorporated into the structured observations (Appendix). This checklist rated the educator on aspects of lesson preparation, lesson presentation, and overall rating of the educator; it also contained space to write educator strengths and weaknesses as well as other comments. Another form was created for this project to capture the number of open- and closed-ended questions asked by the educator and the participant, as well as space to record examples of each type of question asked (Appendix). Both open- and closed-ended question sections were categorized as knowledge-related, application-related, clarification, and conversation. Educator and participant responses to the questions and interactions during the lesson were also recorded; interactions were categorized as social or lesson-related, verbal or non-verbal, and educator/participant interaction or participant/participant interaction in the case of group instruction. Finally, a diagram of the lesson environment was sketched.

Focus Groups

Focus groups (n=6 groups, n=31 participants) were conducted by the same researcher conducting the structured observations. The focus groups were conducted with program participants using ESBA in either a group (n=3 groups, n=15 participants) or individual (n=3 groups, n=16 participants) setting. A moderate level of structure, where questions start out broad and become more specific as the group proceeds, was used to conduct the focus groups (Morgan, 1998). Questions were determined by the research team, PA supervisors, and PA’s located in those areas where the focus groups were conducted (Appendix). Focus group questions addressed participant perceptions of healthy families, changing behavior, factors influencing participation in the program, main ideas learned in the program, and the incentives and activities included in the program. Each of the focus groups was audio-taped and transcribed to ensure all questions and participant responses were documented. Transcripts were then reviewed by the interviewer and three members of the research team to categorize participant responses into common themes.
Table 4. Lesson Topics and Quantitative Evaluation Data

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Key Topics</th>
<th>Evaluation Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson #2</td>
<td>Plan, Shop, Save</td>
<td><strong>Food Behavior Survey</strong></td>
</tr>
<tr>
<td></td>
<td>Meal planning</td>
<td>- How often do you plan meals ahead of time?</td>
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<tr>
<td></td>
<td>Using a shopping list</td>
<td>- How often do you compare prices before you buy food?</td>
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<tr>
<td></td>
<td>Comparing food prices</td>
<td>- How often do you run out of food before the end of the month?</td>
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<tr>
<td></td>
<td>Food safety while shopping and storing food</td>
<td>- How often do you shop with a grocery list?</td>
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<tr>
<td>Lesson #3</td>
<td><strong>Vary Your Veggies... Focus on Fruits</strong></td>
<td><strong>24-Hour Recall</strong></td>
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<tr>
<td></td>
<td>Benefits of consuming fruits and vegetables</td>
<td>- Servings of vegetables</td>
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<tr>
<td></td>
<td>How to increase fruits and vegetables in the diet</td>
<td>- Servings of fruits</td>
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<tr>
<td></td>
<td>How to save money when buying fruits and vegetables</td>
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<tr>
<td></td>
<td>Washing and storing fruits and vegetables</td>
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<tr>
<td>Lesson #4</td>
<td>Make Half Your Grains Whole</td>
<td><strong>24-Hour Recall</strong></td>
</tr>
<tr>
<td></td>
<td>Benefits of consuming whole grains</td>
<td>- Servings of bread</td>
</tr>
<tr>
<td></td>
<td>Choosing whole grains as at least half of the grains consumed</td>
<td><strong>Food Behavior Survey</strong></td>
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<tr>
<td></td>
<td>Storage of grains</td>
<td>- How often do your children eat something in the morning within 2 hours of waking up?</td>
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<tr>
<td>Lesson #5</td>
<td>Build Strong Bones</td>
<td><strong>24-Hour Recall</strong></td>
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<tr>
<td></td>
<td>Dairy foods are the best source of calcium</td>
<td>- Servings of dairy</td>
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<tr>
<td></td>
<td>Non-dairy sources of calcium</td>
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<tr>
<td></td>
<td>Choosing low-fat and non-fat dairy foods</td>
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<tr>
<td></td>
<td>Calcium and physical activity for bone health</td>
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<tr>
<td></td>
<td>Storage of dairy foods</td>
<td></td>
</tr>
<tr>
<td>Lesson #6</td>
<td>Go Lean with Protein</td>
<td><strong>24-Hour Recall</strong></td>
</tr>
<tr>
<td></td>
<td>Choosing lean sources of protein</td>
<td>- Servings of meat</td>
</tr>
<tr>
<td></td>
<td>Food safety</td>
<td><strong>Food Behavior Survey</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- How often do you let meat and dairy foods sit out for more than 2 hours?</td>
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<tr>
<td></td>
<td></td>
<td>- How often do you thaw frozen foods at room temperature?</td>
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<tr>
<td>Lesson #7</td>
<td>Make a Change</td>
<td><strong>Food Behavior Survey</strong></td>
</tr>
<tr>
<td></td>
<td>Limiting foods high in fat, sugar, and salt</td>
<td>- How often have you prepared foods without adding salt?</td>
</tr>
<tr>
<td></td>
<td>Benefits of consuming less fat, sugar, and salt</td>
<td></td>
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</tbody>
</table>

**Statistical Analysis**

Analysis of all data was conducted using SPSS for Windows (SPSS version 15.0, 2006). Descriptive statistics were used to examine the demographic information provided by
the participants on their enrollment forms. Behavior change relative to curriculum was examined by comparing food intake information and behavioral outcome markers collected from participant pre- and post-program 24-hour recalls and food behavior surveys. Paired t-tests were conducted to identify differences in participant pre- and post-program dietary intakes and questionnaire responses. One-way ANOVA was used to explore differences in demographics, dietary intakes, and questionnaire responses between program years. One-way ANOVA was also used to examine differences in dietary intake and questionnaire responses of participants by instructional setting (group versus individual), participant and educator race, and experience of the educator. For the structured observations, comparison of the number of questions asked, visual aids used, and experiential activities used among the instructional settings, lessons, and the educators’ years of experience was conducted using one-way ANOVA; lesson language was examined using t-tests. The level of statistical significance for all analyses was set at p<0.05.
CHAPTER IV: QUALITATIVE EVALUATION OF THE EXPANDED FOOD AND NUTRITION EDUCATION PROGRAM AND FOOD STAMP NUTRITION EDUCATION

A paper to be submitted to The Journal of Nutrition Education and Behavior

Justine R. Hoover, Peggy A. Martin, and Ruth E. Litchfield

ABSTRACT

Objective: use qualitative research methods to evaluate a new nutrition education curriculum.

Design: structured observations (n=44) of new curriculum lessons and focus groups (n=6) with program graduates during spring/summer 2007.

Setting: rural and urban communities in Iowa.

Participants: nutrition education participants (n=78), graduates (n=31), and educators (n=30).

Phenomenon of Interest: theory based learning strategies (open-ended questions, visual aids, experiential learning activities) used by educators and behavior change among program graduates.

Analysis: learning strategies used by educators during structured observations were documented, categorized, and examined by instructional setting, lesson, educator experience, and language used with paired t-tests and one-way ANOVA (SPSS version 15.0, 2006, significance $p \leq 0.05$). Focus group responses were audio taped, transcribed, read, and categorized into common themes by research team.

Results: open-ended questioning and some experiential activities were used less than desired. Language used to teach lessons significantly affected total questions asked and

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1 Iowa State University Extension and Iowa State University Department of Food Science and Human Nutrition
visual aids used (p≤0.05). Graduates from different instructional settings described different program experiences during focus groups.

**Conclusions and Implications:** factors such as language used and instructional setting influence participant experiences and outcomes. Recognition of these factors is critical to maximize participation and behavior change.

### INTRODUCTION

The federally funded Expanded Food and Nutrition Education Program (EFNEP) is a program that strives to improve the health of low-income families through experiential learning (1). Food Stamp Nutrition Education (FSNE), also federally funded, strives to help individuals who qualify for food stamps make choices consistent with the current Dietary Guidelines for Americans (DGA) (2). Both programs are found in all 50 states and some United States territories. In Iowa, adult EFNEP and FSNE employ paraprofessional educators to teach nutrition to parents of young families using the same curriculum.

EFNEP curricula vary from state to state; however, commonalities of the curricula include basic nutrition information, food preparation skills, shopping skills, food safety, and sanitation (3). States routinely modify and update existing curricula and develop new curricula to reflect the most current nutrition and health guidelines, such as the 2005 DGA and MyPyramid (4,5). The Iowa EFNEP and FSNE implemented a new curriculum entitled Eating Smart • Being Active (ESBA)², which incorporated the 2005 DGA and MyPyramid in spring 2007.

The ESBA curriculum was based on the adult learning theory, social learning theory, and experiential learning. The ESBA curriculum also incorporated a learner-centered approach to nutrition education, which focuses education on the learner by using their experiences, interests, talents, and needs to facilitate learning (6). Each of the theories

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² Developed by Colorado State University and University of California, Berkeley.
contributed learning strategies considered important for successful behavior change in the EFNEP and FSNE participant (Table 1).

<table>
<thead>
<tr>
<th>Theory/Approach to Learning</th>
<th>Strategies Used</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adult Learning Theory (7-9)</strong></td>
<td>Small group work and discussions</td>
</tr>
<tr>
<td></td>
<td>Goal setting</td>
</tr>
<tr>
<td></td>
<td>Instructor acts as a facilitator</td>
</tr>
<tr>
<td></td>
<td>Comfortable and supportive environment</td>
</tr>
<tr>
<td><strong>Social Learning Theory (10)</strong></td>
<td>Learning new skills and behaviors by watching others</td>
</tr>
<tr>
<td></td>
<td>Imitating the behavior of a role model</td>
</tr>
<tr>
<td><strong>Experiential Learning Theory (11)</strong></td>
<td>Learning in real life situations</td>
</tr>
<tr>
<td></td>
<td>Application of learning to the participant’s own life</td>
</tr>
<tr>
<td></td>
<td>Instructor acts as a facilitator</td>
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<tr>
<td><strong>Learner Centered Approach (12)</strong></td>
<td>Education based on experiences and characteristics of the learner</td>
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<tr>
<td></td>
<td>Comfortable and supportive environment</td>
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<tr>
<td></td>
<td>Ask open-ended questions</td>
</tr>
<tr>
<td></td>
<td>Form partnerships</td>
</tr>
<tr>
<td></td>
<td>Reinforce learning</td>
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</tbody>
</table>

EFNEP and FSNE strive to promote nutrition-related behavior changes in participants such as increasing consumption of fruits and vegetables and preventing food borne illness. Each ESBA lesson includes specific behavior change objectives and lesson content reflects information pertinent to that behavior change. Evaluation is a key component of EFNEP and FSNE to examine program effectiveness and secure future funding.

The purpose of this study was to use qualitative research methods to evaluate the ESBA curriculum by examining: 1) theory based learning strategies used by EFNEP/FSNE educators via structured observations, and 2) behavior change among program participants via focus group discussions. Structured observations were used to examine three learning strategies (open-ended questioning, experiential learning, and use of visual aids) by variables influencing participant behavior change - educational setting (group versus individual), educator experience, session language (English versus Spanish) and lesson. Focus groups among program participants were used to examine participant experiences and behavior change in group versus individual settings.
METHODS

Subjects

Subjects for this research study were paraprofessional educators and voluntary participants of the Iowa EFNEP and FSNE. All participant subjects represented program graduates, requiring completion of a minimum of eight lessons. Lessons were taught by educators in a small group setting (two or more participants), a one-on-one setting, or a combination of both. Subjects represented both urban and rural areas, and consisted primarily of parents of young children (≤10 years of age) with an income ≤185% of the federal poverty level. Many subjects also participated in food assistance programs such as food stamps and the Special Supplemental Program for Women Infants and Children. All protocols followed during this study were approved by the Iowa State University Human Subjects Review Board. Subjects were given an informational letter describing their rights as a research participant and the research project. Subjects participating in the focus groups signed an informed consent document.

Structured Observations

Structured observations were conducted in each county where EFNEP and FSNE were provided. Each of the eight curriculum lessons and both group and individual settings were represented in the structured observations. The same researcher conducted all of the structured observations using a checklist similar to that described by Vander Wel and colleagues (13). The checklist captured the number of open- and closed-ended questions asked by the educator, as well as space to record examples of each type of question asked (Table 3). Both open- and closed-ended question sections were categorized as knowledge-related, application-related, clarification, and conversation. These categories were based on Bloom’s taxonomy of learning in which knowledge and application are two levels along a continuum of learning (14). Scores for the use of visual aids and experiential learning activities were calculated by assigning one point for each visual aid and experiential learning activity used. The maximum possible score was nine for visual aids and two for experiential learning activities; scores are reported as a percent of the maximum score.
Focus Groups

Focus groups (n=6 groups) were conducted by the same researcher conducting the structured observations. Focus groups were conducted with program participants taught in either a group (n=3 groups) or individual (n=3 groups) setting. A moderate level of structure, where questions start out broad and become more specific as the group proceeds, was used to conduct the focus groups (15). Questions were determined by the research team, educator supervisors, and educators located in those areas where the focus groups were conducted (Table 2). Each of the focus groups was audio-taped and transcribed to ensure all questions and participant responses were documented. Transcripts were then reviewed by the interviewer and three members of the research team to categorize participant responses into common themes.

<table>
<thead>
<tr>
<th>Table 2. Focus Group Questions</th>
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</thead>
<tbody>
<tr>
<td>1. Opening question (Tell us your name and about your family. What is something fun you have done together this summer?)</td>
</tr>
<tr>
<td>2. How would you describe a healthy family?</td>
</tr>
<tr>
<td>3. What would be in the grocery cart of a healthy family?</td>
</tr>
<tr>
<td>a. Why?</td>
</tr>
<tr>
<td>4. Has your family made any ‘healthy’ changes over the last 6 months?</td>
</tr>
<tr>
<td>a. Why did you make that change?</td>
</tr>
<tr>
<td>b. What helped you make that change?</td>
</tr>
<tr>
<td>c. What made that change easy or difficult?</td>
</tr>
<tr>
<td>d. What changes did you try to make that were not successful?</td>
</tr>
<tr>
<td>e. Why was the unsuccessful change difficult to make?</td>
</tr>
<tr>
<td>5. How would you encourage other friends and families to be healthier?</td>
</tr>
<tr>
<td>a. Where did you learn about this?</td>
</tr>
<tr>
<td>6. How did you hear about the EFNEP Healthy Families program?</td>
</tr>
<tr>
<td>7. Why did you decide to participate in EFNEP’s Healthy Families?</td>
</tr>
<tr>
<td>8. What made it difficult to participate in EFNEP’s Healthy Families?</td>
</tr>
<tr>
<td>9. How do you feel about EFNEP’s Healthy Families?</td>
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<tr>
<td>10. What were some of the main ideas you learned from EFNEP’s Healthy Families?</td>
</tr>
<tr>
<td>11. Why were you able to finish EFNEP’s Healthy Families?</td>
</tr>
<tr>
<td>a. What helped you finish?</td>
</tr>
<tr>
<td>b. What might have prevented you from finishing?</td>
</tr>
<tr>
<td>c. Did the gifts at each lesson influence whether or not you finished?</td>
</tr>
<tr>
<td>i. Which gift did you like best?</td>
</tr>
<tr>
<td>ii. How do you use the calendar you were given at the first lesson?</td>
</tr>
<tr>
<td>iii. Have you made any of the recipes from the calendar?</td>
</tr>
<tr>
<td>12. How important is it to have tasting, food preparation, and recipes as part of the lessons?</td>
</tr>
<tr>
<td>13. How important is it to be physically active as part of the lessons?</td>
</tr>
<tr>
<td>14. What comments would you have for the developers of the program?</td>
</tr>
</tbody>
</table>
Statistical Analysis

Comparison of the number and type of questions asked, visual aids used, and experiential activities used among the instructional settings, lessons, and the educators’ years of experience was conducted using one-way ANOVA; lesson language was examined using t-tests (SPSS version 15.0; Chicago, IL). The level of statistical significance for all analyses was set at $p \leq 0.05$.

RESULTS

Structured Observations

Structured observations ($n=44$) were conducted in Iowa counties ($n=14$) offering an EFNEP or FSNE between April – August 2007. One lesson conducted in Bosnian, a language unfamiliar to the observer, was not analyzed resulting in a sample of 43 structured observations. Lessons were taught in English ($n=34$) and Spanish ($n=9$). Lessons taught in an individual setting represented 32 (74%) of the observations while 11 (26%) were taught in a group setting with 46 participants. A total of 78 EFNEP and FSNE participants and 30 educators were observed. Each of the eight lessons was observed including six observations of lesson one, 13 of lesson two, four each of lessons three and four, five each of lessons five and six, three of lesson seven, and two observations of lesson eight.

Open-Ended Questions

Educator questions at each observation were categorized as either open-ended or closed-ended and as knowledge-related, application-related, clarification, or conversational (Table 3). Educators asked a mean of 37.8 questions per observation, which included 580 (34.8%) open-ended and 1085 (65.2%) closed-ended questions (Figure 1). Question categories, as a percent of total questions, in order of prevalence included: closed-knowledge (45.6%), open-knowledge (23.6%), open-application (8.3%), closed-clarification (7.7%), closed-application (6.6%), closed-conversation (5.2%), open-conversation (2.0%), open-clarification (0.8%).
There was no significant difference in the number of questions initiated by the educator between the group (36.7 ± 19.0) and individual (39.4 ± 25.2) instructional settings (Figure 2). However, open-ended questions were more likely to be initiated in the individual (14.4 ± 8.03) versus group (10.7 ± 4.05) setting; closed-ended questions were initiated similarly in the individual (25.0 ± 18.8) and group (26.0 ± 15.6) settings.

Table 3. Examples of Each Question Category

<table>
<thead>
<tr>
<th>Open-ended</th>
<th>Knowledge</th>
<th>“What vegetables did you eat yesterday?”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>“What are you going to do to save money this week?”</td>
<td></td>
</tr>
<tr>
<td>Clarification</td>
<td>“What questions do you have?”</td>
<td></td>
</tr>
<tr>
<td>Conversation</td>
<td>“How are you today?”</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Closed-ended</th>
<th>Knowledge</th>
<th>“Do you read food labels?”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>“Do you buy 100% whole wheat bread?”</td>
<td></td>
</tr>
<tr>
<td>Clarification</td>
<td>“Do you have any questions?”</td>
<td></td>
</tr>
<tr>
<td>Conversation</td>
<td>“Are the kids out of school yet?”</td>
<td></td>
</tr>
</tbody>
</table>

Educators initiated nearly double the number of questions during lesson one (76.7 ± 23.2) than any other lesson (lesson two 39.3 ± 17.0, lesson three 32.0 ± 18.1, lesson four 16.0 ± 11.6, lesson five 25.0 ± 8.60, lesson six 30.8 ± 17.0, lesson seven 32.7 ± 20.5, lesson eight 35.0 ± 31.1). Closed-ended questions were more commonly asked at every lesson except lesson four where educators asked more open- than closed-ended questions (Figure 2).

Figure 1. Distribution of Educator Questions among Categories
Educator experience with EFNEP/FSNE ranged from six months to 23 years and was classified as 0 to 2, 2 to 5, 5 to 10, 10 to 15, and 15 or more years of experience. There were no significant differences in the number or type of questions asked by educators according to years of experience. Educators with 5 to 10 years of experience tended to ask more questions, particularly closed-ended. In comparison, educators with 10 to 15 years of experience tended to ask more open-ended questions.

Educators teaching lessons in Spanish initiated more total (p<0.01) and closed-ended (p<0.01) questions than lessons taught in English. Educators initiated a mean of 57.0 ± 32.8 questions while teaching in Spanish and 33.9 ± 18.2 questions while teaching in English. The mean number of open- and closed-ended questions was higher during Spanish lessons (40.6 ± 26.4 and 16.4 ± 8.20 respectively) than English lessons (21.2 ± 12.6 and 12.7 ± 7.04 respectively).

Figure 2. Characteristics of Educator Initiated Questions
Visual Aids

Lesson-related visual aids included examination of posters and worksheets, reading nutrition facts labels, examining food models, and other visual aids related to specific lessons such as examining samples of whole grains. The visual aid score (number of visual aids used in a lesson) was compared by instructional setting (group versus individual), lesson, years of educator experience, and lesson language (Figure 3). A slight difference in the visual aid score existed between the group (77.3%) and individual instructional setting (79.1%). Lesson four received the highest mean score (93.8%) while lesson seven the lowest (66.7%). Educators with 10 to 15 years of experience were significantly more likely to use visual aids (98.7%) than educators in any other experience group (p<0.05); in contrast, those with two to five years of experience were least likely to use visual aids (71.4%). Lessons taught in English had a significantly higher visual aid score (81.8%) than those taught in Spanish (59.3%) (p<0.001).

Figure 3. Visual Aid Score
Experiential Learning

Experiential activities in ESBA included performing physical activity and tasting or preparing recipes (food experience). The experiential activity score relative to the instructional setting, lesson, years of educator experience, and lesson language appear in Figure 4. There were no significant differences in physical activity or food experience scores by instructional setting, educator experience, or lesson language. Physical activity was more common in the individual setting (87.5%) than in the group (72.7%); however, food experiences were more common in the group setting (54.5%) than the individual (40.6%).

Figure 4. Experiential Activities Score

Lessons seven and eight received the highest physical activity score (100%) while lesson two had the highest food experience score (69.2%). Educators with five to ten years of experience and those with 15 or more were more likely to include experiential learning; they received the highest physical activity scores (100%) and the highest food experience scores (80.0% and 75.0% respectively). Lessons taught in English had higher scores in both
physical activity (88.2%) and food experiences (50.0%) than those taught in Spanish (66.7% and 22.2% respectively).

**Focus Groups**

Focus groups (n=6 groups, n=31 participants) were conducted to examine the experiences of program participants who were taught in an individual setting (n=3 groups, n=16 participants) and in a group setting (n=3 groups, n=15 participants). Participant perceptions of healthy families, recent lifestyle changes made, and factors influencing program participation were gathered during the focus group discussions.

**Healthy Families**

Both group and individual participants recognized healthy families as those who ate healthy food and exercised and spent time together. Individual participants more commonly identified a healthy family as having good communication and caring for and supporting each other.

“I would describe a healthy family as one that eats healthy food and has healthy exercise activities.” – Group participant

“Communication: talking about things, getting along, not fighting - fighting is normal but talking about it, being able to be comfortable enough to express your feelings, trust, and respect.” – Individual participant

Both groups stated foods from the five food groups (grains, vegetables, fruits, dairy, and meat) were healthy food choices. Serving as a role model was identified by both group and individual participants to promote healthier families and children.

“You’ve got to teach all the children how to eat correctly and that’s part of a healthy family.” - Individual participant

“I think probably show by example, like show them what I am doing and then they will probably want to do it too.” – Group participant

**Lifestyle Changes**

The most common lifestyle change identified by both group and individual participants was eating more fruits and vegetables. Additionally, individual participants
identified drinking less soda, safer food handling practices, lower fat food preparation practices, and eating out less often.

“Since coming to the class I have tried to add more fruits and vegetables and some greens.”  
– Group participant

“I have made a whole lot of changes for my kids, me and myself. We don’t eat out as much, fast food, we eat more at the house, and it’s more fruits and vegetables for snacks, and we have been more active.” - Individual participant

Participants shared they made changes because they perceived them to be healthier and to be a role model. Interestingly, individual participants addressed the health of their children more often than group participants.

“I think basically the reason I changed and decided to change my eating habits more than anything else was my kids.” – Individual participant

Group participants were more likely to report various aspects of the program as helpful in making lifestyle changes, whereas individual participants gave personal reasons such as self-determination and being unhappy.

“Some of the things we saw in our lessons, like the fat tubes.” – Group participant

“Personally for myself, I was unhappy with myself.” – Individual participant

The most common unsuccessful lifestyle changes were increasing intake of vegetables and decreasing intake of sweets. Group participants also identified other dietary changes that were unsuccessful while individual participants more frequently identified convincing children to make the change as unsuccessful.

“Eating it – eating the vegetables.” – Group participant

“I tried to get my son and my daughter to eat more vegetables and my son is super, super hard and my daughter will try a bite of something, but my son won’t even try a bite.”  
– Individual participant

The most common barriers to making lifestyle change were personal and family habits; individual participants also identified their children and family as barriers to change.

“It’s the way you have lived for so long and now you try to change it and you can’t give it up.”  
– Group participant

“Mine would be because my children are difficult.” – Individual participant
Program Participation

Group participants were most likely to identify gaining more information about eating healthy as a reason for program participation in the program, whereas individuals identified family well-being and recipes as reasons for participation.

“I want to make sure I eat right and be healthy. I am just starting a family and I want to be healthier and I want them to be healthy.” – Group participant

“I wanted to learn about it plus get new recipes that are healthy for you instead of the other recipes.” – Individual participant

The most common barrier to participation supplied by both instructional settings was time.

“Meeting once a week - I mean that hour or 45 minutes to put aside with all my other appointments.” – Individual participant

Factors facilitating graduation from the program included wanting to learn more for group participants and the flexibility of the program and educator for individual participants.

“You actually started looking forward to it. Like I can’t wait to see what I find out that I don’t know.” – Group participant

“Just [the educator] coming to the house and her understanding about other things going on, and she was really helpful.” – Individual participant

On the other hand, barriers to graduating were lack of child care for group participants and lack of flexibility for individual participants. Most participants felt that the incentives did not influence their graduation from the program.

“If you didn’t have someone to watch your kids.” – Group participant

“If [the educator] wasn’t so flexible and willing to work with my schedule and being available, I probably wouldn’t have been able to finish.” - Individual participant

Food safety and shopping practices were topics more frequently identified by individual participants as main ideas they learned from the program; conversely, healthy food choices and label reading were more frequently identified by group participants. Group and individual participants responded that it was very important and helpful to have food experiences; however, group participants gave more positive responses about physical activity being fun and important while some individual participants dreaded it or did not participate.

“[Food activities are] very important, like I said before, I wouldn’t have tried any of them if we hadn’t baked them in class and I wouldn’t have the new recipes to try the new things.” – Group participant
“[Physical activity] is important because it goes along with eating the right foods. You are going to be eating healthy, but you won’t be as healthy as you would be if you were exercising along with it.” - Group participant

“It makes you really understand what the lessons are talking about, otherwise it’s all words and it doesn’t really sink in.” – Individual participant

Overall, participants gave positive responses about the entire program, though group participants tended to have more positive comments than individual participants.

**DISCUSSION**

Qualitative evaluation generates rich descriptions of a sample of the population categorized into common themes or concepts (16-18), which can be collected using interviews, observations, focus groups, or existing data sources such as personal journals (19). There is limited qualitative evaluation of EFNEP and FSNE that includes only interviews and focus groups with program graduates (20-23). This study used structured observations and focus groups to examine the implementation of learning strategies by EFNEP and FSNE educators as well as program experiences and food- and nutrition-related behavior changes among program participants.

Open-ended questions are a component of the adult learning theory and the learner centered approach (6-9,12). This type of question is used to challenge learners to use critical thinking skills and apply knowledge they have learned (24). Open-ended questioning can also facilitate the learner centered approach strategies of activating prior learning (review of previous lessons) and reinforcing learning (reviewing current lesson) (12). EFNEP and FSNE educators in this study were more likely to initiate closed- than open-ended questions in all lessons, except lesson four. The greater number of open-ended questions asked during this lesson may be related to the greater use of visual aids during this lesson; thus, it is possible that the use of visual aids may promote increased discussion using open-ended questions. In this study, it appears educators were more likely to use open-ended questions in the individual instructional setting. Educators may feel uncomfortable using open-ended
questions in group situations where responses can vary greatly and cause the learners to diverge from the lesson (24).

Lesson one consisted of significantly more open- and closed-ended questions, which is most likely due to the educators obtaining a 24-hour dietary recall from the participants during this lesson, requiring them to ask many questions of the participant. Lessons taught in Spanish included more total and closed-ended questions than those taught in English (p<0.01). This may be due to the fact that lesson materials were not translated into Spanish at the time of the observations, which created more verbal discussion as the materials were being translated by the educator. However, this may indicate a cultural difference; it is possible that the Spanish culture tends to prefer auditory learning where learners benefit from verbal discussion of lesson topics.

Bloom’s taxonomy was used in this study to categorize questions initiated by educators by level of cognition (14). Within cognition, learning is divided into six categories from simplest to most difficult: 1) knowledge, 2) comprehension, 3) application, 4) analysis, 5) synthesis, and 6) evaluation. It is desirable for learners to move from the knowledge category, where they are able to recall information, to higher learning categories such as application, where they are able to apply what is learned in new situations. In this study, educators were more likely to initiate knowledge rather than application related questions. A greater number of application questions is desired to help learners transfer information they are learning to their personal lives; thus, future training needs to address the use of application-related and open-ended questioning.

Visual aids in the ESBA curriculum incorporate the learner-centered approach by accommodating a wider variety of learning styles (12). For example, posters, worksheets, and nutrition facts labels enhance the experience for visual learners whereas rubber bands to determine portion sizes of pasta and miniature pom-poms to count the number of fat grams in a fast food meal aid kinesthetic learners. Visual aids were used significantly more often by educators with 10 to 15 years of experience (p<0.05) and when the lesson was taught in English (p<0.001). The visual aids were not translated into Spanish at the time of the observations, explaining the less frequent use in Spanish lessons. However, it is also possible that there may be differences in preferred learning styles relative to the racial/ethnic
background of the educator or learner. It is possible that English speaking educators are more likely to be visual or kinesthetic learners themselves, thus are more likely to use visual aids when in the teaching role. It may also be that English speaking participants prefer visual learning while Spanish speakers prefer auditory learning.

Physical activity and food preparation or tasting are activities in ESBA that incorporate the experiential learning theory (11). Experiential learning activities have benefited learners in educational settings other than EFNEP and FSNE including professional development (26), higher education (27, 28), and a student internship program (29). These studies suggest learners gain more knowledge and are able to apply the knowledge from experiential learning, which would support the behavior changes desired of EFNEP/FSNE participants. Structured observations revealed that food experiences are used less often than physical activity. It is possible that educators are more comfortable using physical activity than food experiences with their participants, or that educators were not able or could not afford to use food experiences. This is in contrast to previous research that reported women, with similar demographics to the Iowa EFNEP/FSNE educators, have greater self-efficacy toward food- and nutrition-related activities rather than physical activity (25). There were no significant differences in experiential activities relative to program delivery variables (instructional setting, lesson, experience of the educator, and language used).

Adult learning theory and the learner-centered approach purport benefits of a group instructional setting (6-9,12). Previous EFNEP and FSNE evaluations suggest effectiveness with different instructional settings (group versus individual), but none included qualitative data. Luccia et al. suggest improvement is independent of instructional setting (30), while others suggest the one-on-one setting is more effective (31-33). Structured observations revealed no significant differences in the number of open-ended questions asked, visual aids used, nor experiential activities used between group and individual instructional settings; however, focus groups revealed differences in the experiences of program participants between instructional settings.

Participants from the individual and group settings identified time and personal or family habits as barriers to making change and participating in the program; these responses have been previously reported in programs with a similar target audience (23, 25, 34).
Participants in the individual instructional setting more commonly framed their responses around their family, indicating that they made changes for their family or children and that their family and their habits were barriers to change. This may be related to the fact that participants of the individual instructional setting focus groups did not know each other and were not accustomed to participating in a group. They may not have felt comfortable sharing more personal responses; therefore, they kept their responses limited to the safer topic of their family. It is also possible that individual participants discussed their family more often because the educator typically taught them the lessons in their home, often with their young children present; therefore, they identified their experience more closely with their family than the group participants who typically received the lessons outside their home without children present.

Educators as role models is described by the social learning theory (10), one of the theories used in the development of ESBA. The ESBA curriculum was designed to promote the educator as a role model for program participants and foster role modeling among program participants. Participants from the group instructional setting were more likely to share the program enabled them as role models for their children and others. It is possible that group participants perceived the educator as a role model, whereas individual participants perceived the educator as a friend. This could be related to the instructional setting; groups usually meet outside the home at a time and place scheduled by the educator whereas individuals often invite the educator into their home when it is most convenient.

Factors facilitating graduation from the program were also different between group and individual participants. Group participants desired to learn more whereas individual participants cited the flexibility of the program as influencing continued program participation and graduation. This suggests that the availability of two instructional settings benefits participants because they can choose what works best for them. It has been suggested that a group environment can aid the learning of parents (35), and this study suggests the group setting may be best for those who desire more discussion; however, the individual setting may be best for those who desire flexibility.

Limitations exist for both parts of this study. Structured observations did not equally represent all factors that may influence behavior change. The individual setting was
observed more frequently than the group, lessons taught using the English language were observed more often than those taught using Spanish, and lesson two was viewed at least twice as many times as any other lesson. In addition, each lesson was not observed in both instructional settings and in both languages. Structured observations were coordinated by educators at times and dates convenient for the participant, educator, and researcher, giving the researchers little control over these variables.

Each focus group conducted with participants from the group instructional setting included some participants who knew each other because they had completed the lessons in the same group, whereas participants in the individual focus groups did not know any other focus group participants. Thus, group participants may have felt more comfortable and provided more open and honest answers than individual participants who felt less comfortable providing information around unfamiliar people (36). In addition, educators recruited participants for the structured observations and focus groups and tended to contact participants they perceived as reliable and enthusiastic about the program, which may bias the results of this study.

The information collected from the structured observations and focus groups provides some suggestions for those who work with nutrition education and for future research. Training educators in the use of open-ended questions, particularly higher cognition (application, synthesis, evaluation) questions, may help educators become more comfortable with using open-ended questions and facilitate behavior change in the learners (24). Educators also need to be provided and trained on resources and techniques, such as visual aids and experiential learning activities, to accommodate a variety of learning styles. This is especially important when a program targets a population consisting of more than one racial or ethnic group (37). Lastly, the differences in experiences with the program between learners in the group versus individual instructional setting suggest that offering learners a choice of instructional setting may be beneficial. Differences in personal and family characteristics, as well as home environment, may lead a learner to prefer one setting over the other and ultimately influence their program participation, experience, and success.

Research on nutrition education needs to further examine the experiences of the English speaking versus the Spanish speaking learner. This study suggests these different
learners may prefer different learning styles, though more extensive research in this area needs to occur to support this finding. Further research could also examine the perceptions of the educators about nutrition education and variables influencing participant behavior change. A final research direction could be to expand what has been examined here to other variables that may influence behavior change such as whether the participant is pregnant or nursing, the population of the town or city in which the participant resides, whether or not the participant is a single parent, the number of children living with the participant, and the gender of the participant.

CONCLUSION

In conclusion, this study sought to examine the implementation of a new nutrition education curriculum relative to learning strategies used by educators and variables thought to influence participant behavior change. Open-ended questions and experiential learning strategies were not used as often as desired. Training educators to use application-related, open-ended questioning is particularly important because it encourages higher level cognition, which is more likely to lead to behavior change, among participants (14). Questioning and open-ended questioning were more common during lessons taught in Spanish while using visual aids was more common during lessons taught in English. This suggests possible differences in preferred learning styles between the two ethnic groups. Though learning strategies were not used differently among instructional settings, participants taught in a group setting described different experiences with the program than those in the individual setting, which suggests that it may be beneficial for participants to be allowed to choose their preferred instructional setting. Overall, it is clear that certain variables have an effect on participant behavior change and the experiences participants perceive after completing instruction with the curriculum. It is important to recognize that these exist and develop strategies to ensure that each participant is able to gain nutrition knowledge and engage in related behavior changes.
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CHAPTER V: EVALUATION OF A NEW NUTRITION EDUCATION CURRICULUM AND FACTORS INFLUENCING ITS IMPLEMENTATION

A paper to be submitted to The Journal of Extension

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ABSTRACT

This study evaluated a nutrition education curriculum by examining participant behavior change. A previous curriculum (April - September 2005 and 2006) was compared to a new curriculum (April – September 2007) using pre- and post-program 24–hour dietary recalls and food behavior surveys. Participant, educator, and program variables were explored relative to behavior change. The new curriculum elicited behavior change similar to the previous curriculum; factors influencing behavior change included participant and educator race and educator experience. Participant and educator variables need to be considered in future program/curriculum implementation.

INTRODUCTION

Many families living in America face economic hardships every day; 36.5 million Americans lived in poverty in 2006 (1), 35.5 million were food insecure (2), and 25.3 million received emergency food assistance (3). America’s Second Harvest, a nationwide network of food banks, reports that 68 percent of people receiving emergency food assistance were below the federal poverty level, 83.3 percent had an income ≤185 percent of the Federal Poverty Guidelines, and 70 percent were food insecure in 2005 (4). These economic

3 Iowa State University Extension and Iowa State University Department of Food Science and Human Nutrition
hardships frequently lead to physical hardships, ultimately impacting health status. The National Center for Health Statistics report those who are poor or near poor have higher rates of hypertension, high cholesterol, overweight (adults and children), and physical inactivity compared to the non-poor (5). The Centers for Disease Control and Prevention report that, as income increases from less than $15,000 per year to greater than $50,000 per year, the prevalence of diabetes, hypertension, inactivity and lack of health care coverage decrease (6).

The Expanded Food and Nutrition Education Program (EFNEP) and Food Stamp Nutrition Education (FSNE) are federally funded programs found in all 50 states and several United States territories that seek to help families with limited incomes use available resources to improve food- and nutrition-related practices. These programs are unique in that they do not provide financial assistance; however, these two programs provide nutrition education, which attempts to provide lifelong rather than immediate benefits to the family. EFNEP and FSNE seek to help low-income families use resources currently available to prevent future nutrition-related health problems. Cost benefit analyses of EFNEP in four states, including Iowa, demonstrate that, for every dollar spent on the program, savings in healthcare or food costs occurred for the participant (7-10). These nutrition education programs frequently employ paraprofessional educators to teach basic nutrition information, food preparation skills, shopping skills, food safety, and sanitation (11). In Iowa, program participants are taught by paraprofessionals in small groups, individually, or a combination of both.

The curricula used by EFNEP and FSNE must reflect the most current nutrition and health guidelines, which in the United States, is the 2005 Dietary Guidelines for Americans (DGA) and MyPyramid (12,13). In March 2007, the Iowa EFNEP and FSNE implemented a new curriculum entitled Eating Smart • Being Active (ESBA)\(^4\), which was written to reflect the new guidelines.

Evaluation of EFNEP and FSNE is an important aspect of program management to document effectiveness and secure future funding. Effectiveness is the ability to meet program objectives, as well as specific objectives of the curriculum. In EFNEP and FSNE, objectives include changing food- and nutrition-related behaviors. It is necessary to examine

\(^4\) Developed by Colorado State University and University of California, Berkeley.
the effectiveness of the programs relative to the curriculum employed as well as program, curriculum, and educator factors that may influence behavior change.

Evaluation of EFNEP and FSNE has been in existence since their inception. Numerous studies report the success of EFNEP and FSNE in changing food group and nutrient intakes, food- and nutrition-related behaviors, and food- and nutrition-related knowledge (7,14-22). Program effectiveness using different instructional settings, typically group versus one-on-one setting has been reported. One study suggests program outcomes are independent of teaching setting (23), while others suggest the one-on-one setting is more effective (24-26).

The purpose of this study was to evaluate the new ESBA curriculum in the Iowa EFNEP and FSNE and explore factors influencing participant behavior change. Specifically, servings of food groups, intake of four of the seven nutrients of concern identified by the DGA (12), and food- and nutrition-related behaviors were examined relative to the content of the ESBA curriculum and participant/educator characteristics.

**METHODS**

The ESBA curriculum was developed by a team of EFNEP professionals in Colorado and California subsequent to the release of the 2005 DGA and MyPyramid (12,13). As part of a multi-state pilot, Iowa piloted ESBA in three counties for ten months in 2006. Following the pilot, revisions were made to the curriculum and curriculum materials were assembled. Training of all Iowa EFNEP and FSNE educators occurred at four separate sessions, two lessons per training session, during winter 2007. By spring 2007 all Iowa educators were teaching participants using the ESBA curriculum.

**Subjects**

Subjects were voluntary participants of the Iowa EFNEP and FSNE between April – September 2005, April – September 2006, and April – September 2007. All subjects represented program graduates, requiring completion of a minimum of eight lessons.
Lessons were taught by paraprofessional educators in a small group setting (two or more participants), a one-on-one setting, or a combination of both. Subjects represented both urban and rural areas, and consisted primarily of parents of young children (≤10 years of age) with an income ≤185% of the federal poverty level. Many subjects also participated in food assistance programs such as food stamps and the Special Supplemental Program for Women, Infants, and Children. All protocols followed during the study were approved by the Iowa State University Human Subjects Review Board. Subjects were given an informational letter describing their rights as a research participant and the research project.

Data Collection

Subject demographics, family composition, ethnicity, and pregnancy/nursing status were collected using the EFNEP and FSNE enrollment form. Dietary intake and food- and nutrition-related behaviors were collected from 24-hour dietary recalls and food behavior surveys, each taken at entry into and exit from the program. Dietary intake and food- and nutrition-related behavior data have previously been used to evaluate EFNEP and FSNE (7,14-26). Data were collected between April - September 2005, April – September 2006 (old curriculum) and April - September 2007 (new ESBA curriculum). Old curriculum data were collected from both 2005 and 2006; 2005 data represented old curriculum prior to the 2005 DGA and MyPyramid and 2006 data included nutrient intakes.

24-Hour Dietary Recall

The 24-hour recalls were collected using the multiple pass method (27). In this method, the educator first obtained a quick list of foods consumed by the subject in the last 24 hours. Next, the educator reviewed the quick list to gather more detailed information about the food consumed (i.e. preparation methods, ingredients used, and brand names) and the amounts consumed. Lastly, the educator reviewed the list one last time to verify the information for accuracy and completeness. Key topics taught in the curriculum and power calculations on 2006 program data were used to identify items from the 24-hour recall to be examined (Table 1).
### Table 1. Lesson Topics and Evaluation Data

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Key Topics</th>
<th>Evaluation Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson #2</td>
<td><strong>Plan, Shop, Save</strong></td>
<td><strong>Food Behavior Survey</strong></td>
</tr>
<tr>
<td></td>
<td>Meal planning</td>
<td>-How often do you plan meals ahead of time?</td>
</tr>
<tr>
<td></td>
<td>Using a shopping list</td>
<td>-How often do you compare prices before you buy food?</td>
</tr>
<tr>
<td></td>
<td>Comparing food prices</td>
<td>-How often do you run out of food before the end of the month?</td>
</tr>
<tr>
<td></td>
<td>Food safety while shopping and storing food</td>
<td>-How often do you shop with a grocery list?</td>
</tr>
<tr>
<td>Lesson #3</td>
<td><strong>Vary Your Veggies... Focus on Fruits</strong></td>
<td><strong>24-Hour Recall</strong></td>
</tr>
<tr>
<td></td>
<td>Benefits of consuming fruits and vegetables</td>
<td>-Servings of vegetables</td>
</tr>
<tr>
<td></td>
<td>How to increase fruits and vegetables in the diet</td>
<td>-Servings of fruits</td>
</tr>
<tr>
<td></td>
<td>How to save money when buying fruits and vegetables</td>
<td>-Vitamin A intake (RE)</td>
</tr>
<tr>
<td></td>
<td>Washing and storing fruits and vegetables</td>
<td>-Vitamin C intake (milligrams)</td>
</tr>
<tr>
<td>Lesson #4</td>
<td><strong>Make Half Your Grains Whole</strong></td>
<td><strong>24-Hour Recall</strong></td>
</tr>
<tr>
<td></td>
<td>Benefits of consuming whole grains</td>
<td>-Servings of bread</td>
</tr>
<tr>
<td></td>
<td>Choosing whole grains as at least half of the grains consumed</td>
<td><strong>Food Behavior Survey</strong></td>
</tr>
<tr>
<td></td>
<td>Storage of grains</td>
<td>-How often do your children eat something in the morning within 2 hours of waking up?</td>
</tr>
<tr>
<td></td>
<td>Importance of consuming breakfast</td>
<td>-Fiber intake (grams)</td>
</tr>
<tr>
<td>Lesson #5</td>
<td><strong>Build Strong Bones</strong></td>
<td><strong>24-Hour Recall</strong></td>
</tr>
<tr>
<td></td>
<td>Dairy foods are the best source of calcium</td>
<td>-Servings of dairy</td>
</tr>
<tr>
<td></td>
<td>Non-dairy sources of calcium</td>
<td>-Calcium intake (milligrams)</td>
</tr>
<tr>
<td></td>
<td>Choosing low-fat and non-fat dairy foods</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Calcium and physical activity for bone health</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Storage of dairy foods</td>
<td></td>
</tr>
<tr>
<td>Lesson #6</td>
<td><strong>Go Lean with Protein</strong></td>
<td><strong>24-Hour Recall</strong></td>
</tr>
<tr>
<td></td>
<td>Choosing lean sources of protein</td>
<td>-Servings of meat</td>
</tr>
<tr>
<td></td>
<td>Food safety</td>
<td><strong>Food Behavior Survey</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-How often do you let meat and dairy foods sit out for more than 2 hours?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-How often do you thaw frozen foods at room temperature?</td>
</tr>
<tr>
<td>Lesson #7</td>
<td><strong>Make a Change</strong></td>
<td><strong>Food Behavior Survey</strong></td>
</tr>
<tr>
<td></td>
<td>Limiting foods high in fat, sugar, and salt</td>
<td>-How often have you prepared foods without adding salt?</td>
</tr>
<tr>
<td></td>
<td>Benefits of consuming less fat, sugar, and salt</td>
<td></td>
</tr>
</tbody>
</table>

**Food Behavior Survey**

The food behavior survey included the core set of ten food- and nutrition-related behavior questions required of all EFNEP programs (Table 1). Power calculations on 2006 program data were used to identify food behavior survey questions to be examined. The questions address meal planning, food shopping practices, food safety, and eating breakfast; topics discussed in at least one of the lessons of the ESBA curriculum. All food behavior survey questions were answered using a 5-point Likert scale with one corresponding to “never perform the described behavior” and five corresponding to “almost always perform
the behavior”. Total food behavior score was calculated by summing the ten food behavior scores for a maximum possible score of 50; questions expected to elicit a lower score were reverse scored.

**Statistical Analysis**

Analysis of all data was conducted using SPSS for Windows (SPSS version 15.0; Chicago, IL). Descriptive statistics were used to examine the demographic information provided by the participants on their enrollment forms. Behavior change relative to curriculum was examined by comparing food intake information and behavioral outcome markers collected from participant pre- and post-program 24-hour recalls and food behavior surveys. Paired t-tests were conducted to examine participant pre- and post-program dietary intakes and questionnaire responses within program years. One-way ANOVA was used to explore differences in demographics, dietary intakes, and questionnaire responses between program years. Change in food group intake (pre- to post-program) was examined within program years by absolute intake. Change in food group intake between program years was examined by percent change in intake related to changes in Evaluation/Reporting System (ERS) reporting, which made comparison of absolute intake impossible. One-way ANOVA was also used to examine differences in dietary intake and questionnaire responses of participants by instructional setting (group, individual, both), participant and educator race, and experience of the educator. The level of statistical significance for all analyses was set at p<0.05.

**RESULTS**

**Participant and Educator Characteristics**

Participant characteristics are reported in Table 2. The highest graduation rate was seen in 2005 with 328 graduates during the six month reporting period followed by 296 graduates in 2007 and 201 graduates in 2006. The 2006 graduates did not include those taught by three educators piloting the new curriculum. The majority of the participants from
each year were female, white, and in their mid- to late-twenties. In 2006, significantly more males graduated than 2005 and 2007 \((p \leq 0.01)\). From 2005 to 2007 the percent of graduates who were white significantly decreased \((p=0.01)\), while Hispanic participation increased. Graduates participating in group instruction was significantly less and those in individual instruction was significantly more in 2006 and 2007 than 2005 \((p \leq 0.01)\).

Educator characteristics appear in Table 3. There were slightly more educators in 2007 (35 educators) than 2005 (27 educators) and 2006 (26 educators). There were no significant differences in educator characteristics across years.

Table 2. Participant Characteristics

<table>
<thead>
<tr>
<th></th>
<th>2005 ((n=328))</th>
<th>2006 ((n=201))</th>
<th>2007 ((n=296))</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
<td>Mean</td>
</tr>
<tr>
<td>Age</td>
<td>27.1</td>
<td>8.51</td>
<td>27.9</td>
</tr>
<tr>
<td>Other Adults in Home</td>
<td>0.823&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.874</td>
<td>1.03&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Sex - Female</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>301&lt;sup&gt;a&lt;/sup&gt;</td>
<td>91.8</td>
<td>169&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>216&lt;sup&gt;a&lt;/sup&gt;</td>
<td>65.9</td>
<td>114&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Black</td>
<td>24</td>
<td>7.3</td>
<td>16</td>
</tr>
<tr>
<td>Native American</td>
<td>14</td>
<td>4.3</td>
<td>7</td>
</tr>
<tr>
<td>Hispanic</td>
<td>70</td>
<td>21.3</td>
<td>57</td>
</tr>
<tr>
<td>Asian</td>
<td>4</td>
<td>1.2</td>
<td>7</td>
</tr>
<tr>
<td>Lesson Setting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>188&lt;sup&gt;a&lt;/sup&gt;</td>
<td>57.3</td>
<td>66&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Individual</td>
<td>112&lt;sup&gt;b&lt;/sup&gt;</td>
<td>34.1</td>
<td>106&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Both</td>
<td>28</td>
<td>8.5</td>
<td>29</td>
</tr>
</tbody>
</table>

<sup>a</sup>b \(p \leq 0.05\)

**Dietary Intake**

All program years saw improvement in dietary intake indicated by an increase in the number of servings consumed from each food group and amounts of fiber, calcium, and vitamins A and C. Significant increases in meat, dairy, vegetable, bread, and fruit groups were seen in 2005, meat, milk, vegetable and fruit groups and fiber, calcium, and vitamins A and C in 2006, and milk, vegetable, and fruit groups and fiber, calcium, and vitamin A in 2007 \((p < 0.05)\) (data not shown). Percent change in dietary intake from food groups from pre- to post-program by year is shown in Figure 1 actual change in dietary intake from
nutrients is shown in Figure 2. Graduates from 2007 showed significantly greater improvement in dietary intake from the fruit group than graduates from 2005; 2006 graduates showed greater improvement from the dairy and bread groups than 2005 graduates and greater improvement in vitamin A intake than 2007 graduates \( (p \leq 0.05) \).

Table 3. Educator Characteristics

<table>
<thead>
<tr>
<th></th>
<th>2005 (n=27)</th>
<th></th>
<th>2006 (n=26)</th>
<th></th>
<th>2007 (n=35)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
<td>Percent</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>21</td>
<td>77.8</td>
<td>19</td>
<td>73.1</td>
<td>24</td>
<td>68.6</td>
</tr>
<tr>
<td>Black</td>
<td>2</td>
<td>7.4</td>
<td>1</td>
<td>3.8</td>
<td>2</td>
<td>5.7</td>
</tr>
<tr>
<td>Native American</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Hispanic</td>
<td>4</td>
<td>14.8</td>
<td>5</td>
<td>19.2</td>
<td>8</td>
<td>22.9</td>
</tr>
<tr>
<td>Asian</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>3.8</td>
<td>1</td>
<td>2.9</td>
</tr>
<tr>
<td>Years of Experience</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-2 Years</td>
<td>6</td>
<td>22.2</td>
<td>8</td>
<td>30.8</td>
<td>15</td>
<td>42.9</td>
</tr>
<tr>
<td>2-5 Years</td>
<td>4</td>
<td>14.8</td>
<td>3</td>
<td>11.5</td>
<td>6</td>
<td>17.1</td>
</tr>
<tr>
<td>5-10 Years</td>
<td>9</td>
<td>33.3</td>
<td>7</td>
<td>26.9</td>
<td>4</td>
<td>11.4</td>
</tr>
<tr>
<td>10-15 Years</td>
<td>4</td>
<td>14.8</td>
<td>5</td>
<td>19.2</td>
<td>6</td>
<td>17.1</td>
</tr>
<tr>
<td>15+ Years</td>
<td>4</td>
<td>14.8</td>
<td>3</td>
<td>11.5</td>
<td>4</td>
<td>11.4</td>
</tr>
</tbody>
</table>

Figure 1. Percent Change in Dietary Intakes from Food Groups
A number of factors including instructional setting, participant and educator race, and educator experience were found to have significant, but inconsistent, relationships with change in dietary intake (data not shown). Those participating in the individual instructional setting in 2005 and both instructional settings (group and individual) in 2006 had significantly higher change in fruit intake than those in the group instructional setting (2005 and 2006) and the individual instructional setting (2006) (p<0.01). Those participating in the group instructional setting had significantly less change in vitamin C intake than those taught in both instructional settings in 2006 and less change in calcium than those in the individual instructional setting and vitamin A than those in the individual and both instructional settings in 2007 (p<0.05). Graduates taught by a black educator had significantly higher positive change in dairy intake than those taught by a white educator in 2005 and greater change in fiber intake than those taught by educators of any other race in 2006 and 2007 (p<0.05). In 2006, graduates taught by educators with two to five years of experience had greater improvement in vegetable intake than those taught by educators with less than two years of experience and greater improvement in fiber and vitamin C intake than those taught by
educators with any other amount of experience (p<0.05). In 2007, graduates taught by educators with two to five years of experience had greater improvement in vitamin A intake than those taught by educators with less than two years of experience and in vitamin C intake than those taught by educators with 10 to 15 years of experience (p<0.05).

**Food Behavior**

To explore change in food behavior, a total behavior score and individual items from the food behavior survey were examined. Of a maximum total behavior score of 50, program entry averages were 33.2 ± 4.93, 32.8 ± 5.40, and 32.1 ± 5.94 and exit averages were 38.5 ± 6.12, 39.5 ± 6.14, and 38.4 ± 5.84 for 2005, 2006, and 2007 respectively. Significant positive change was seen from pre- to post-program on nine of ten food-behavior questions, whereas “adding no salt” showed significant negative change in all three program years (p<0.05). The behaviors “compare prices,” “use grocery list,” think about “healthy foods,” “reading labels,” and “foods sit out” exhibited significant yet inconsistent differences among the program years (Figure 3) (p≤0.05). Significant differences were noted in only three behaviors “reading labels” in 2005, “thaw foods” in 2006, and “plan meals” in 2007 among the three instructional settings (group, individual, both) (p<0.05), indicating no consistent influence of instructional setting (data not shown). One finding unique to 2007 graduates was single parents exhibited less positive change on four of the behaviors (p≤0.05) (data not shown).

Hispanic participants had a lower program entry total behavior score in 2005 and 2007. Program exit score and change in score from entry to exit were significantly higher among Hispanic participants than white participants in 2007 (p<0.05) (Figure 4). Hispanic graduates and those taught by Hispanic educators showed significantly greater improvement on the “foods sit out” (2005) and “compare prices” (2006) behaviors (p<0.05) (data not shown). In 2007, Hispanic participants and participants taught by Hispanic educators showed greater positive change on the behaviors “plan meals,” “compare prices,” “use grocery list,” “reading labels,” and “thaw foods” (p≤0.05). The Hispanic graduates also showed greater improvement on the “breakfast” and “adding no salt” questions (p≤0.05) (data not shown).
At program entry in 2005, participants taught by educators with 10 to 15 years of experience had significantly lower total scores leading to significantly greater change in total score from entry to exit than those taught by educators with a different amount of experience (p<0.05) (Figure 5). At program exit in 2007, participants taught by educators with two to five and 10 to 15 years of experience had significantly higher total scores and change in total score from entry to exit (p<0.05). Graduates taught by educators with five to ten years of experience showed more improvement on the behaviors “plan meals,” “compare prices,” “use grocery list,” “healthy foods,” and “foods sit out” in 2005 (p≤0.05). In 2006, when an educator had zero to two years of experience, participants demonstrated significantly less change on the “plan meals” question than when an educator had more experience (p≤0.05). When taught by educators with two to five or ten to fifteen years of experience, 2007 graduates showed more improvement on the “plan meals,” “compare prices,” “use grocery list,” and “reading labels” questions (p≤0.05). Additionally, 2007 graduates taught by educators with two to five years of experience showed greater change on the “foods sit out” and “thaw foods” questions (p≤0.05) (data not shown).
DISCUSSION

Dietary intakes and food behavior survey data has previously been used to evaluate EFNEP and FSNE. Del Tredici and colleagues demonstrated significantly higher intakes of milk, meat, and fruits and vegetables among program graduates compared to non-participant
controls six months after program completion (15). Amstutz and Dixon (16) and Romero and others (17) reported that EFNEP participants had significantly higher intakes of milk, meat, fruit and vegetable, and bread and cereal food groups at graduation compared to entry into the program. Similar results were found by Torisky and colleagues with the exception that meat consumption did not change (18). Cason and colleagues examined both food groups and nutrient intakes; significant increases in servings from all food groups and intakes of iron, calcium, vitamin A, vitamin C, and dietary fiber from entry to exit from the program were observed (19). Similar results were found in a group of EFNEP participants compared to a demographically similar group of non-participants; those who participated in the program improved their intake of meat, dairy, fruit, vegetables, grains, iron, calcium, vitamin C, vitamin B₆, and iron (7). The present study supports these findings; EFNEP and FSNE graduates improved their intakes from the meat, dairy, vegetable, bread, and fruit groups over three six-month periods during 2005, 2006, and 2007 and graduates improved their intake of fiber, calcium, and vitamins A and C in 2006 and 2007 in the Iowa EFNEP and FSNE.

Improvements on all ten food behavior survey questions have been reported by Arnold and Sobal (20) and Brink and Sobal (21) among program graduates, and at follow-up one year after graduation. Other studies suggest fewer improvements on the food behavior survey. Cason and colleagues report significant improvements in two behaviors – “plan meals” and “reading labels” (19). Burney and Haughton reported program participants were better able to manage their financial resources by improving on the “plan meals,” “comparing prices,” and “use grocery list” questions (7). Similarly, Romero and others reported significant improvement only in participant food shopping practices (19). The present study found that Iowa EFNEP and FSNE graduates demonstrated positive change in nine of ten food behavior survey questions during 2005, 2006, and 2007.

Previous evaluations of the EFENP and FSNE have shown varied results in dietary intake and food behavior survey data. Possible explanations for this variation may lie in differences in program delivery between the program areas evaluated since each evaluation was conducted in only one state, not nation-wide or in multiple states. Participant and educator demographics, curricula used, and instructional setting differ between states. All these factors may influence participant behavior change, thus influencing the results of the
various evaluations. This study sought to further examine factors influencing participant behavior change, though only in Iowa, so it would be beneficial to examine these factors nation-wide or in multiple states.

The primary aim of this study was to compare participant behavior change seen in 2007 following implementation of the new ESBA curriculum to change seen in 2005 and 2006 when the previous curriculum was used. No other research on EFNEP and FSNE has reported differences between curricula. The dietary intake data showed significantly greater change (percent) in 2007 graduates from the meat and fruit groups than 2005 graduates ($p \leq 0.05$). Change in food behaviors were highest in 2006 graduates, where five of the behaviors saw significantly greater improvements than 2005 or 2007 data ($p \leq 0.05$). This suggests that neither curriculum is superior; rather, both have strengths and weaknesses and both support positive behavior changes.

The second aim of this study was to examine factors that influence participant behavior change. Previous research has examined one factor influencing behavior change – instructional setting. Luccia and colleagues suggested significant changes in dietary behavior were independent of the setting of the instruction (group versus individual) (23); however, these results have not been confirmed by others (24-26). Dollahite and Scott-Pierce reported that, although behavior of all participants improved from the beginning to the end of the program, participants in the individual setting had significantly greater improvement in food- and nutrition-related behaviors than participants in the group setting (24). Yet, these differences may have been due to demographic differences between those taught individually versus in groups; individual participants were more likely to be from rural areas while group participants were more likely from urban areas. Similarly, Dickin and others and Cason and others reported that the individual setting resulted in greater improvement in behavior than the group setting (25,26).

Though the current study examined many factors influencing behavior change, instructional setting, participant and educator race, and educator years of experience were the only factors that consistently and significantly impacted change in various aspects of dietary intake and food behavior survey score across all three program years. Data from this study suggests that the ESBA curriculum supports behavior change independent of instructional
setting despite being written using the adult learning theory and learner centered approach, both of which support education in groups (28-32). This finding is important to the Iowa EFNEP and FSNE where lessons are taught in both instructional settings and the number of participants in the group setting has significantly decreased since 2005. The Iowa EFNEP and FSNE need to use a curriculum which is effective at producing a behavior change in both group and individual participants.

Participant and educator race were factors influencing behavior change, particularly in 2007. In 2007, Hispanic participants showed significantly greater improvement than white participants on six of the food behaviors; graduates of Hispanic educators showed significantly greater improvement on five of the behaviors the same year. The majority of Hispanic participants are taught by Hispanic educators, thus, these findings would likely not be found independently. Additionally, the number of white participants was significantly less (p<0.05), while the number of Hispanic participants increased in 2007. There was no significant difference in total food behavior entry score between white and Hispanic participants but a significant difference in exit score and change in score from entry to exit (p<0.05), suggesting Hispanic participants did not experience greater behavior change because they had more room to improve than white participants. Interestingly, during a portion of the 2007 data collection period, none of the ESBA lesson materials were translated into Spanish; most of the visual aids used with the lessons still are not translated. It is possible that because lesson materials often had to be translated into Spanish for Hispanic participants, more discussion of the lesson materials was stimulated, which resulted in greater behavior change in Hispanic participants. It is also possible that some of the learning strategies incorporated in the ESBA curriculum support a preferred learning style among Hispanic participants leading to greater behavior change. A qualitative study of the ESBA curriculum suggests that the learner-centered approach, which accommodates a variety of learning styles, benefits participants of various racial and ethnic backgrounds (33).

Educator experience significantly influenced all three years of data. Significant differences between change in five food behaviors in 2005, six behaviors in 2007, and vegetable consumption in 2006 relative to educator experience were observed. Educators with two to five years of experience tended to be associated with a greater number of food-
and nutrition-related behavior changes, particularly in 2007. Those with five to ten and ten
to fifteen years of experience also showed more influence on positive change than those with
zero to two or more than fifteen years of experience. Examination of total food behavior
score in 2005 revealed participants experiencing the greatest behavior change, were taught by
educators with five to ten years of experience. However, a significantly lower entry score
(p<0.05), but a similar exit score suggests these participants had more room to improve.
Change in total food behavior score in 2007 was significantly greater in the participants
taught by educators with two to five and 10 to 15 years of experience (p<0.05). Significant
differences in total food behavior score existed only at exit, which indicates some factor (i.e.
participant age, educator experience, or race) led to greater change, not a lower entry score.
Educators with two to five years of experience likely have more nutrition knowledge and
experience teaching to the target audience than those with zero to two years of experience,
thus explaining why their graduates showed greater behavior change. It is also possible that
educators with two to five years of experience had less experience with the old curriculum
and were less resistant to changing to the new ESBA curriculum; thus, their participants
demonstrated greater behavior change than those of more experienced educators. One final
possibility is that there may be a bell shaped curve relative to educator experience and
behavior change, where educators with the extreme least or most amounts of experience
instruct participants who make less behavior change than participants taught by educators in
with levels of experience that fall in the middle.

The influence of a participant being a single parent on their food behavior change was
not significant in 2005 or 2006, but was in 2007. Behavior change of single parents may be
expected to be lower because they have sole responsibility of caring for their children
financially, physically, and emotionally leaving less time to concentrate on their own needs
(34).

One major limitation to this study is that the reporting system used by the Iowa
EFNEP/FSNE (Evaluation/Reporting System or ERS) changed data collection procedures in
the different program years making it difficult to compare dietary intakes between years.
Servings of food groups were collected in 2005, actual intakes and servings of food groups
were collected in 2006, and actual intakes and cups or ounces of food groups were collected
in 2007 to be consistent with the DGA and MyPyramid (12,13). For this reason, dietary intake data was examined as a percent change between pre- and post-program rather than change in number of servings or amount consumed. Another limitation is related to the 2007 data; data collection started shortly after educators had been trained on the ESBA curriculum, and educators had much less experience teaching this curriculum than the previous curriculum taught in 2005 and 2006. Lastly, significant differences existed between participant characteristics from the three program years – the number of white participants and participants in groups significantly decreased from 2005 to 2007 and there were significantly more males and less single parents in 2006 than in 2005 and 2007. Thus, some differences among program years may be related to changing demographics rather than program curriculum or educator.

Those who work with nutrition education programs may find these results useful. The 2007 data demonstrated food- and nutrition-related behavior improvement similar to that of 2005 and 2006, which suggests that thorough educator training on a new curriculum can result in immediate program effectiveness. The benefit attained from thorough training is particularly noteworthy here because nearly 43 percent of educators in 2007 had less than two years of experience and, of these, 67 percent were new hires. The absence of differences between instructional settings (group versus individual) suggests that the curriculum is effective in both settings. Focus groups with participants in the different educational settings suggest allowing participants to choose their preferred setting may facilitate greater behavior change (33). Differences in behavior change between racial/ethnic groups represented in this study as well as the increasing diversity of the target population necessitates accommodating a variety of learning needs while writing and implementing curricula. This may be accomplished through educator training on cultures other than their own, hiring a diverse group of educators which mirrors the diversity of the target population, and by writing curricula that incorporate culturally diverse concepts while accommodating many learning styles. The differences in behavior change with educator years of experience suggest that training needs to occur early in the career of an educator to help them gain nutrition knowledge and become comfortable teaching to the target audience. Additionally, educators who have been with the program longest may need support to aid in the transition to a new
curriculum and to prevent complacency with the current curriculum in order to maintain a high level of behavior change in their graduates.

More research needs to be done on factors that influence participant behavior change. This research provides conflicting evidence to most of the research conducted on the influence of instructional setting (24-26), while supporting only one study (23). Thus, further research needs to examine the differences in instructional setting, possibly across multiple states as previous research has only examined its influence in single states with those states located in the Eastern region of the country. The influence of race and ethnicity of participants and educators needs further examination as well. Though this study saw an effect, especially between Hispanic and white participants, a concrete explanation for this effect has not been established. Another research direction would be to determine the training and other needs of educators with varying amounts of experience. A last possible research direction would be to examine behavior change of program graduates across multiple states as this would provide a more complete assessment of the effectiveness of EFNEP and FSNE nationally. However, in order to conduct an evaluation of this magnitude it would be beneficial for the ERS to develop reports to better demonstrate participant behavior change in line with the 2005 DGA.

CONCLUSIONS

The purpose of this study was to evaluate the new ESBA curriculum in the Iowa EFNEP and FSNE and factors influencing participant behavior change. Though the ESBA curriculum had been in place for only a short time, behavior change of graduates taught using ESBA was similar to those taught using an established curriculum. The most significant factors influencing curriculum effectiveness, measured by participant behavior change, were participant and educator race and educator years of experience. These two factors need to be further examined on all levels of program implementation (national, state, and county) in order to promote behavior change among all participants regardless of their own characteristics or the characteristics of their educator.
ACKNOWLEDGEMENTS
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CONCLUSIONS

This research project sought to determine the effectiveness of a new EFNEP and FSNE curriculum at promoting food- and nutrition-related behavior change and to determine factors influencing participant behavior change. Quantitative research showed that, though the new curriculum had been in place for only a short time, behavior change of graduates taught using the new curriculum was similar to those taught using an established curriculum. In addition, many educators teaching the new curriculum had less than two years of experience. Taken together, these findings suggest that thorough educator training can immediately produce significant behavior change in program participants. The most significant factors influencing behavior change, particularly under the new curriculum, were participant and educator race and educator years of experience. In contrast to previous research, instructional setting (group versus individual) was not found to be a significant factor (Cason, Scholl, and Kassab, 2002; Dickin, Dollahite, and Habicht, 2005; Dollahite and Scott-Pierce, 2003). It is possible that some aspect of the new curriculum promotes behavior change among Hispanic participants over white participants. It is also possible that educators with varying levels of experience have different levels of nutrition knowledge and a different ability to adapt to the use of a new curriculum.

Qualitative research showed that factors influencing participant experiences and behavior change were instructional setting and language used to teach lessons. Though differences in learning strategies used by educators (open-ended questioning, visual aids, and experiential learning) did not exist, participant experiences were different by instructional setting. This suggests that both settings support behavior change, but it may be beneficial for participants to be allowed to choose their preferred instructional setting. Lessons with Spanish speaking participants included more questioning by educators, an environment supportive of auditory learners, while lessons with English speaking participants included more visual aids, an environment supportive of visual learners. These findings suggest that differences in learning styles may exist among those with different racial and ethnic backgrounds. A last finding of qualitative research was the lower use of open-ended and application-related questions in comparison to closed-ended and knowledge-related questions. It is desirable for
educators to initiate application-related and open-ended questions because they support
higher level cognition among participants and encourage participants to use critical thinking
skills and apply concepts to their own lives (Badger and Thomas, 1992; Bloom, et al., 1956).

Taken together, quantitative and qualitative research reveal future research needs and
issues that professionals in nutrition education may find useful. Future research needs to
further examine the differences seen between Hispanic and white program participants.
Possible directions to include in this research would be differences in learning styles between
racial and ethnic groups and other possible characteristics of nutrition education programs,
curricula, and educators that may influence behavior change in participants from different
racial and ethnic groups. Future research also needs to examine the training and other needs
of educators with varying amounts of experience. A last research direction would be to
evaluate participant behavior change and factors influencing behavior change using
quantitative and qualitative methods across multiple states in order to more completely assess
the effectiveness of EFNEP and FSNE nationally.

Differences in the needs of participants from different racial and ethnic groups exist that
should be addressed by nutrition education professionals. These may be addressed by
writing curricula that support learning and address concepts important to a diverse target
audience, hiring staff members that mirror the racial and ethnic diversity of the target
audience, and training staff to recognize and support cultural differences. Next, educators
with different levels of experience exhibit differences in use of learning strategies and
participant behavior change suggesting that future educator training needs to focus on the
characteristics of educators that will help them foster the greatest possible behavior change in
their participants. Participants may benefit from educator training on the use of open-ended
questions as well as having a choice of instructional setting. Lastly, thorough training on a
new curriculum or of new educators can provide immediate behavior change in program
participants. Overall, it is clear that certain factors influence participant behavior change and
the experiences participants perceive after completing a nutrition education program. It is
important to recognize that these exist and develop strategies to ensure that each participant
is able to gain nutrition knowledge and use that to make behavior changes.
APPENDIX

Iowa Expanded Food and Nutrition Education Program (EFNEP) and Family Nutrition Program (FNP)

Name: ___________________________ (First) (Last)

Address: ___________________________

City: __________________ Zip: ______

Phone: ______

Age: ______ Check one: ❑ Female ❑ Male

If female, are you currently:
❑ Pregnant  ❑ Yes ❑ No
❑ Nursing?  ❑ Yes ❑ No

Place of residence:
❑ Farm
❑ Towns under 10,000 & rural non-farm
❑ Towns and cities 10,000-50,000
❑ Suburbs of cities over 50,000
❑ Central cities over 50,000

Ethnicity (check the category you identify with):
❑ Hispanic or Latino ❑ Not Hispanic or Latino

Race (check all that apply):
❑ American Indian or Alaskan Native
❑ Asian
❑ Black or African American
❑ Native Hawaiian or other Pacific Islander
❑ White

Programs you and your family participate in (check all that apply):
❑ Child Nutrition (School lunch/breakfast)
❑ FDPIR (Food Distribution Program on Indian Reservations)
❑ Food Stamps
❑ Head Start
❑ FIP/TANF
❑ TEFAP (Temporary Emergency Food Assistance Program)
❑ WIC/CSFP (Commodity Supplemental Food Program)
❑ Other ___________________________

(specify)

Monthly household cash income: $___________

(i.e. income from job, child support, FIP, SSI, etc.)

For EFNEP and FNP Office Use

Program Assistant: ___________________________

Participant ID: ___________________________

Entry date: ___________________________

Subgroups:
❑ EFNEP
❑ FNP
❑ Have a Healthy Baby
❑ Other ___________________________

(specify)

Lesson Type: ❑ Group ❑ Individual ❑ Both

Number of other adults in household (not counting participant): ________

IOWA STATE UNIVERSITY
University Extension

NP 171 - Entry | May 2007
Iowa Expanded Food and Nutrition Education Program (EFNEP) and Family Nutrition Program (FNP)

Name: ____________________________  ____________________________  (First)  (Last)

Address: ____________________________________________________________

City: ____________________________  Zip: ____________________________

Phone: ____________________________

If female, are you currently:

- Pregnant?  □ Yes  □ No
- Nursing?  □ Yes  □ No

Did your family receive assistance as the result of a referral or suggestion from EFNEP/FNP personnel?  □ Yes  □ No

If "yes", check all that apply:

- Child Nutrition (School lunch/breakfast)
- FDPIR (Food Distribution Program on Indian Reservations)
- Food Stamps
- Head Start
- FIP/TANF
- TEFAP (Temporary Emergency Food Assistance Program)
- WIC/CSFP (Commodity Supplemental Food Program)
- Other

---

For EFNEP and FNP Office Use

Program Assistant: ____________________________

Participant ID: ____________________________

Total Number of Lessons: ____________________________

Comments: ____________________________________________________________

Exit Date: ____________________________

Exit reason (check one):

- Educational objectives met
- Returned to school
- Took job
- Family concerns
- Staff vacancy
- Moved
- Lost interest
- Other (specify): ____________________________

Other obligations
- Lost contact with participant

---

The U.S. Department of Agriculture (USDA) prohibits discrimination in its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Many materials can be made available in alternative formats for ADA clients. To file a complaint of discrimination, write USDA, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenues, SW, Washington, DC 20250-9410 or call 202-720-5964.

This publication is funded by the Expanded Food and Nutrition Education Program, USDA’s Food Stamp Program, and Iowa State University Extension. The Food Stamp Program provides nutrition assistance to people with low income. It can help you buy nutritious food for a better diet. To find out more, contact your local Department of Human Services office or call toll-free 1-877-YES-FOOD.


IOWA STATE UNIVERSITY
University Extension

NP 171 - Exit  May 2007
<table>
<thead>
<tr>
<th>Food Item</th>
<th>How Much?</th>
<th>Food Item</th>
<th>How Much?</th>
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</thead>
<tbody>
<tr>
<td>Morning meal</td>
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<tr>
<td>Snack</td>
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<tr>
<td>Midday meal</td>
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<tr>
<td>Snack</td>
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<tr>
<td>Evening meal</td>
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<td></td>
</tr>
<tr>
<td>Snack</td>
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</tbody>
</table>

Do you take nutritional supplements?  □ Yes  □ No

How much did you spend on food last month?  $ __________

Indicate your amount of moderate physical activity:

□ less than 30 minutes most days

□ 30 to 60 minutes most days

□ more than 60 minutes most days
This is not a test and there are no wrong answers. These are questions about ways you plan and fix food.

Circle the response that best describes how you usually do things.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Never</th>
<th>Seldom</th>
<th>Sometimes</th>
<th>Most of the time</th>
<th>Almost always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>How often do you plan meals ahead of time?</td>
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<tr>
<td>2</td>
<td>How often do you compare prices before you buy food?</td>
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<td>3</td>
<td>How often do you run out of food before the end of the month?</td>
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<td>4</td>
<td>How often do you shop with a grocery list?</td>
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<tr>
<td>5</td>
<td>This question is about meat and dairy foods. How often do you let these foods sit out for more than two hours?</td>
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<td>6</td>
<td>How often do you thaw frozen foods at room temperature?</td>
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<td>7</td>
<td>When deciding what to feed your family, how often do you think about healthy food choices?</td>
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<td>8</td>
<td>How often have you prepared foods without adding salt?</td>
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<tr>
<td>9</td>
<td>How often do you use the “Nutrition Facts” on the food label to make food choices?</td>
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<tr>
<td>10</td>
<td>How often do your children eat something in the morning within 2 hours of waking up?</td>
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<tr>
<td>11</td>
<td>Do you eat more than one kind of vegetable each day?</td>
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<tr>
<td>12</td>
<td>Do you eat more than one kind of fruit each day?</td>
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<tr>
<td>13</td>
<td>How often do you participate in at least 30 minutes of moderate physical activity every day?</td>
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<tr>
<td>14</td>
<td>I wash my hands with soap and warm running water before preparing food.</td>
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<tr>
<td>15</td>
<td>How often do you let your children choose how much to eat?</td>
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<tr>
<td>16</td>
<td>Do you eat low fat foods?</td>
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<tr>
<td>17</td>
<td>When you have the option of getting a “super-sized” portion of food or beverage, how often do you order it?</td>
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<td>18</td>
<td>Do your meals consist of a variety of foods?</td>
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<tr>
<td>19</td>
<td>How often do you use a meat thermometer to measure the doneness of meat?</td>
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# Teaching Observation Notes
## EFNEP/FNP Unit Review Form 2

Program assistant ____________________________________________________________

Observer ___________________________ Date _____________________________

Type of setting (one-to-one, adult group, youth group, etc.) _______________________

Topic ___________________________ Length of lesson _______________________

Assign an evaluation number to each criteria according to the following scale:

- 4 = Very good--little improvement needed
- 3 = Good--some improvement needed
- 2 = Fair--much improvement needed
- 1 = Poor--very much improvement needed
- NA = Not applicable or no chance to observe

### Preparation

1. Program assistant was well prepared to teach the lesson.  
   - 4 3 2 1 NA

### Presentation

2. The lesson included follow-up of the previous lesson and mini-goal.  
   - 4 3 2 1 NA

3. Program assistant adheres to the curriculum:  
   a. followed the lesson plan.  
   b. used visual aids and written materials effectively and appropriately.  
   c. did not add or omit material not included with the curriculum other than to respond to questions or concerns initiated by the participant.  
   - 4 3 2 1 NA

4. The program assistant actively involved participant(s) in the lesson:  
   a. was sensitive to participant(s) reaction and needs.  
   b. used open-ended questions.  
   - 4 3 2 1 NA
5. Nutrition information
   a. was accurate and appropriate, and
   b. presented in clear language that was appropriate to the participant(s).

6. The program assistant:
   a. answered participant questions correctly or promised to follow-up if answer was not known.
   b. handled interruptions and distractions effectively and appropriately.

7. Program assistant helped participant(s)
   a. set a behavior change mini-goal with specific action steps (adult only)
   b. made plans with participant(s) for the next lesson.

Overall

8. The program assistant
   a. established rapport with participant(s).
   b. conveyed sensitivity and respect.
   c. displayed positive attitude and praised participant(s) accomplishments.
   d. displayed enthusiasm.

Comments:
Identify strength(s):

Identify area(s) for improvement:

Other comments:
Number of open-ended questions asked:

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<thead>
<tr>
<th>Question Type</th>
<th>Educator Initiated</th>
<th>Participant Initiated</th>
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Responses to questions:

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Diagram room set-up (positioning of chairs, tables, instructor, participants, etc.):
Focus Group Questions

1. Opening question (Tell us your name and about your family. What is something fun you have done together this summer?)

2. How would you describe a healthy family?

3. What would be in the grocery cart of a healthy family?
   a. Why?

4. Has your family made any ‘healthy’ changes over the last 6 months?
   a. Why did you make that change?
   b. What helped you make that change?
   c. What made that change easy or difficult?
   d. What changes did you try to make that were not successful?
   e. Why was the unsuccessful change difficult to make?

5. How would you encourage other friends and families to be healthier?
   a. Where did you learn about this?

6. How did you hear about the EFNEP Healthy Families program?

7. Why did you decide to participate in EFNEP’s Healthy Families?

8. What made it difficult to participate in EFNEP’s Healthy Families?

9. How do you feel about EFNEP’s Healthy Families?

10. What were some of the main ideas you learned from EFNEP’s Healthy Families?

11. Why were you able to finish EFNEP’s Healthy Families?
   a. What helped you finish?
   b. What might have prevented you from finishing?
   c. Did the gifts at each lesson influence whether or not you finished?
      i. Which gift did you like best?
      ii. How do you use the calendar you were given at the first lesson?
      iii. Have you made any of the recipes from the calendar?

12. How important is it to have tasting, food preparation, and recipes as part of the lessons?

13. How important is it to be physically active as part of the lessons?

14. What comments would you have for the developers of the program?
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