

6-1-2009

Qualitative Tools to Examine EFNEP Curriculum Delivery

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Recommended Citation

Hoover, J. R., Martin, P. A., & Litchfield, R. E. (2009). Qualitative Tools to Examine EFNEP Curriculum Delivery. *The Journal of Extension*, 47(3), Article 3. <https://tigerprints.clemson.edu/joe/vol47/iss3/3>

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June 2009
Volume 47 Number 3
Article Number 3FEA3

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Qualitative Tools to Examine EFNEP Curriculum Delivery

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Abstract: Use of qualitative research methods to evaluate nutrition education programs is limited. Structured observations and focus groups, qualitative research methods, were conducted to examine use of theory-based learning strategies and participant experiences in a nutrition education program. Theory-based learning strategies included use of open-ended questions, visual aids, and experiential learning activities. Open-ended questioning and some experiential activities were used less often than desired. Language of lesson delivery and instructional setting appear to influence the use of learning strategies. Lesson delivery and instructional setting may be relevant for preferred learning styles of different cultures.

Introduction

The federally funded Expanded Food and Nutrition Education Program (EFNEP) strives to improve the health of low-income families through experiential learning (United States Department of Agriculture [USDA], 2006). Food Stamp Nutrition Education, also federally funded, helps food stamp recipients and those who are eligible make choices consistent with the current Dietary Guidelines for Americans (DGA) (USDA, 2007). The FSNE acronym is used throughout this article, although it recently changed to the Supplemental Nutrition Assistance Program education (SNAP-ed). The Iowa EFNEP and FSNE programs employ paraprofessional educators to provide nutrition education to program participants using the same curriculum.

EFNEP curricula vary from state to state; however, commonalities of curricula include basic nutrition information, food preparation skills, shopping skills, and food safety (Montgomery & Willis, 2005). The goal is to promote nutrition-related behavior changes in participants, such as increasing consumption of fruits and vegetables and preventing food-borne illness. In spring 2007, Iowa EFNEP and FSNE implemented a new curriculum entitled Eating Smart Being Active (ESBA), developed by Colorado State University and University of California, Berkeley, which reflects the most current nutrition and health guidelines, the 2005 DGA and MyPyramid (USDA & United States Department of Health and Human Services [HHS], 2005).

The ESBA curriculum was based on adult learning theory (Rossman, 1973), social learning theory (Bandura, 1977), and experiential learning (Dewey, 1938). This curriculum also incorporated a learner-centered approach to nutrition education, focusing on the experiences, interests, talents, and needs of the learner to facilitate learning (Henson, 2003). Each theory contributed learning strategies considered important for successful behavior change among EFNEP and FSNE participants (Table 1).

EFNEP is routinely evaluated with quantitative measures, including food and nutrient intake data from 24-hour recalls and food behaviors from self-report surveys. This data is collected at enrollment and completion of the program to document change in food/nutrient intake and food behaviors. Yet participants' perceptions and experiences are not captured in this quantitative data. In addition, information relative to the delivery of the curriculum is not captured.

The study reported here used qualitative research methods, complementing previously reported quantitative methods (Hoover, Martin, & Litchfield, in press), to examine participants' perceptions and experiences as well as delivery of the ESBA curriculum. Focus groups were conducted to identify: perceptions of "healthy" facilitators and barriers to participating in the program and making behavior change; usefulness of incentives used in the program; usefulness of experiential activities; and overall usefulness of the program. Structured observations were used to document implementation of specific learning strategies (open-ended questioning, visual aids, and experiential learning) in various instructional settings (individual/group and English/Spanish).

Table 1.
Learning Theories and Approaches Used by ESBA

Theory/Approach to Learning	Strategies Used
Adult Learning Theory	Small group work and discussions Goal setting Instructor acts as a facilitator Comfortable and supportive environment
Social Learning Theory	Learning new skills and behaviors by watching others Imitating the behavior of a role model
Experiential Learning Theory	Learning in real life situations Application of learning to the participant's own life Instructor acts as a facilitator
Learner Centered Approach	Education based on experiences and characteristics of the learner Comfortable and supportive environment

	Ask open-ended questions Form partnerships Reinforce learning
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Methods

Curriculum Training

Training of educators occurred in four phases; two of the eight lessons were covered at each phase. A trained educator from the pilot test of the ESBA curriculum taught each lesson in its entirety and followed with an in-depth review of each lesson. Following each training phase, educators practiced delivering the lessons to other educators and their supervisors before teaching participants. Throughout the training, learning strategies incorporated into the curriculum, particularly open-ended questioning and experiential learning, were emphasized.

Subjects

Subjects for the research study were paraprofessional educators and a convenience sample of Iowa EFNEP and FSNE participants. Paraprofessional educators (n=30) represent previous participants of the EFNEP or individuals who have lived in poverty themselves. Their ages ranged from 30 to 55 years. Seven educators were bi-lingual and Hispanic, delivering the lessons in English and Spanish.

Individuals voluntarily participating in the EFNEP between April and August 2007 served as participants for the study. The majority of these participants were female (93.2%), with a mean age of 28.1 years. Racial composition of participants included White (54.7%), Hispanic (29.4%), Black (11.8%), Native American (1.4%), and Asian (1.4%). Participants consisted of parents of young children (≤ 10 years of age) with an income less than or equal to 185% of the federal poverty level. Both urban and rural areas were represented; however, Iowa is predominantly rural, with only three metropolitan statistical areas.

All protocols followed during this study were approved by the Iowa State University Human Subjects Review Board. Participants were given an informational letter describing their rights as a research participant and the research project.

Structured Observations

Structured observations (n=43) were conducted in all Iowa counties (n=14) offering EFNEP or FSNE between April and August 2007. A total of 78 EFNEP and FSNE participants and 30 educators were observed. Each educator was observed a minimum of one time; the mean number of observations per educator was 1.4 (range 1 to 4). Both group and individual settings were observed. The individual setting represented 32 (74%) of the observations, while 11 (26%) were taught in a group setting with 46 participants (mean group size 4.18). Lessons were observed being delivered in English (n=34; 79%) and Spanish (n=9; 21%).

The same bi-lingual (English and Spanish) researcher conducted the structured observations using a checklist adapted from previous research (Vander Wel, Litchfield, Ryan, Geadelmann, Pendergast, & Ullom, 2005; Johnson, Borleske, Gleason, Bailey, & Scantlebury, 1998). The checklist captured the number of open- and closed-ended questions asked by the educator. Questions were categorized as knowledge, application, clarification, or conversational questions. Knowledge and application represent two levels of cognition from

Bloom's taxonomy (Bloom, 1956). Clarification and conversation were categories identified in previous research with a similar audience (Vander Wel et al., 2005; Johnson et al., 1998).

Scores for 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 for each lesson was nine for visual aids and two for experiential learning activities; scores are reported as a percent of the maximum score.

Statistical Analysis

Data captured through the structured observations were examined qualitatively and quantitatively. The type and number of questions asked, number of visual aids used, and number of experiential activities used were examined by instructional setting (group vs. individual) and language used for lesson delivery (English or Spanish) using t-tests (SPSS version 15.0; Chicago, IL). The level of statistical significance was set at $p \leq 0.05$.

Focus Groups

Focus groups (n=6 groups) were conducted by the same researcher, with program participants taught in either a group (n=3 groups) or individual (n=3 groups) setting. A moderate level of structure, where questions begin 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, educator supervisors, and educators located in those areas where the focus groups were conducted (Figure 1). Each focus group was audiotaped and transcribed to ensure all questions and participant responses were documented. Transcripts were reviewed by the interviewer and three members of the research team to categorize participant responses into common themes.

Figure 1.
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?

Results

Open-Ended Questions

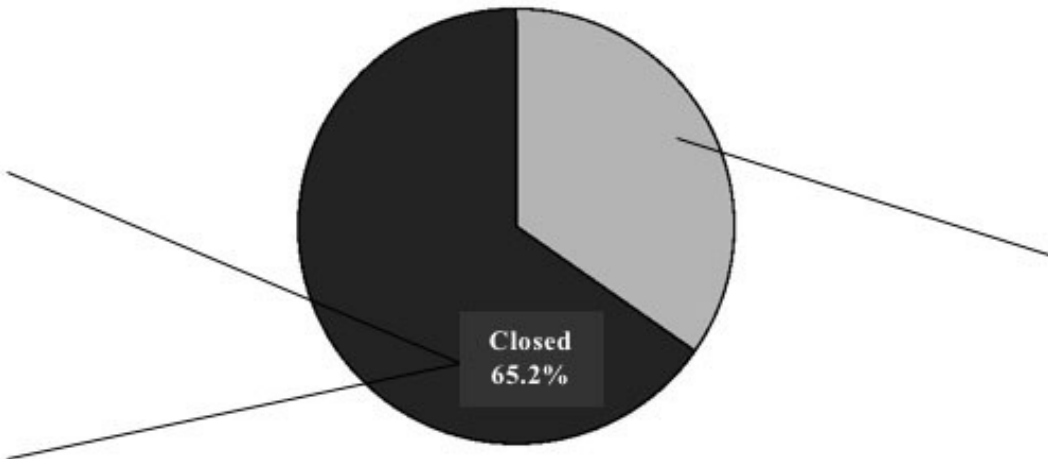
Educator-initiated questions were categorized as open-ended or closed-ended and as knowledge, application, clarification, or conversational (Table 2). Educators asked a mean of 37.8 questions per observation, which included 580 (34.8%) open-ended and 1,085 (65.2%) closed-ended questions (Figure 2). Knowledge questions were most prevalent, regardless of whether an open- (67.8%) or closed-ended (46.4%) question was posed. Application questions were more commonly posed using open-ended (24.0%) than closed-ended (2.7%) questions.

Table 2.
Examples of Question Categories

Open-ended	Knowledge	"What vegetables did you eat yesterday?"
	Application	"What are you going to do to save money this week?"
	Clarification	"What questions do you have?"
	Conversation	"How are you today?"
Closed-ended	Knowledge	"Does this food have fiber?"

Application	"Do you buy 100% whole wheat bread?"
Clarification	"Do you have any questions?"
Conversation	"Are the kids out of school yet?"

Figure 2.
Distribution of Educator Questions among Categories



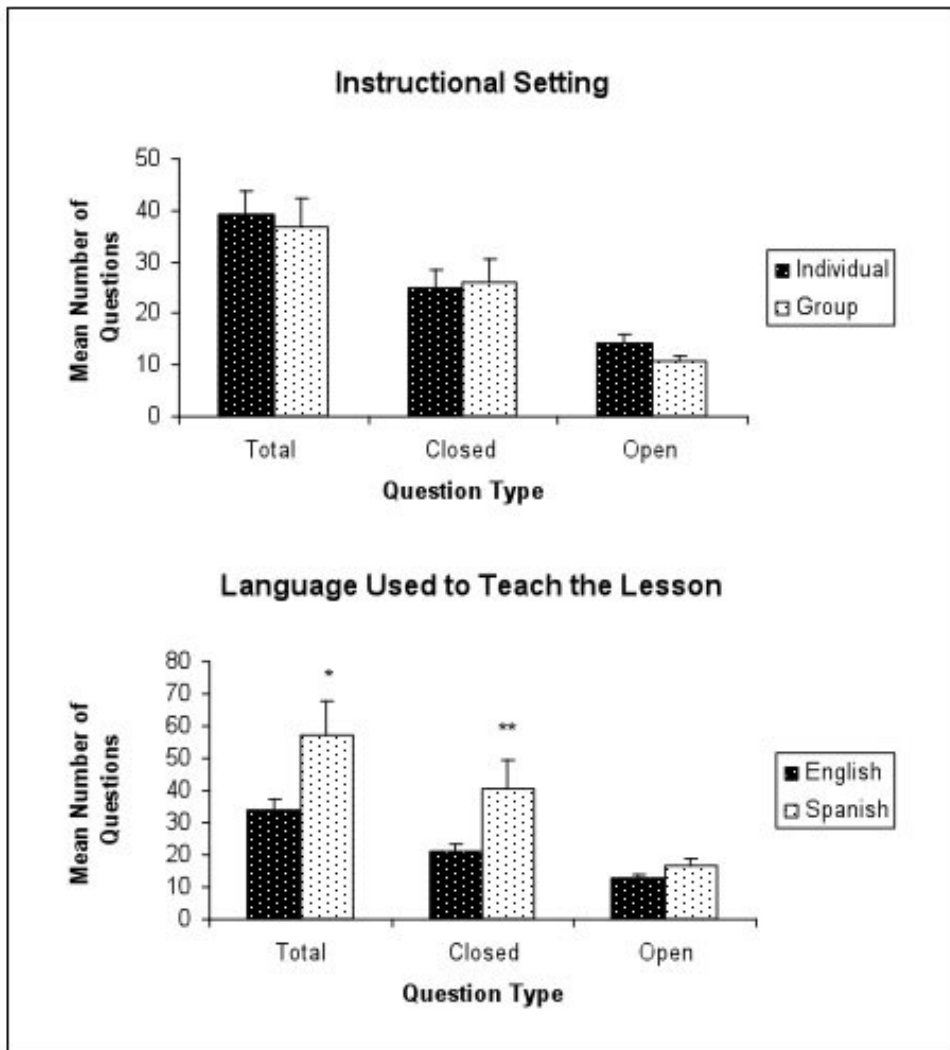
There was no significant difference in number of questions initiated by the educator between the group (36.7 ± 19.0) and individual (39.4 ± 25.2) instructional settings (Figure 3). However, educators tended to initiate more open-ended questions when teaching in individual (14.4 ± 8.03) versus group (10.7 ± 4.05) settings; closed-ended questions were initiated similarly in the individual (25.0 ± 18.8) and group (26.0 ± 15.6) settings.

When lessons were delivered in Spanish, more total and closed-ended questions were posed than in lessons taught in English ($p < 0.01$; Figure 3). 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 closed-ended questions was significantly higher during lessons delivered in Spanish (40.6 ± 26.4) than in lessons delivered in English (21.2 ± 12.6).

Visual Aids

Visual aids included posters, worksheets, nutrition facts labels, food models, and lesson-specific visual aids. There was no significant difference in use of visual aids between the group and individual instructional settings (Figure 4). Visual aids were used more frequently in lessons delivered in English (81.8%) than in Spanish (59.3%) ($p < 0.001$).

Figure 3.
Characteristics of Educator Initiated Questions



*p<0.01, **p<0.001

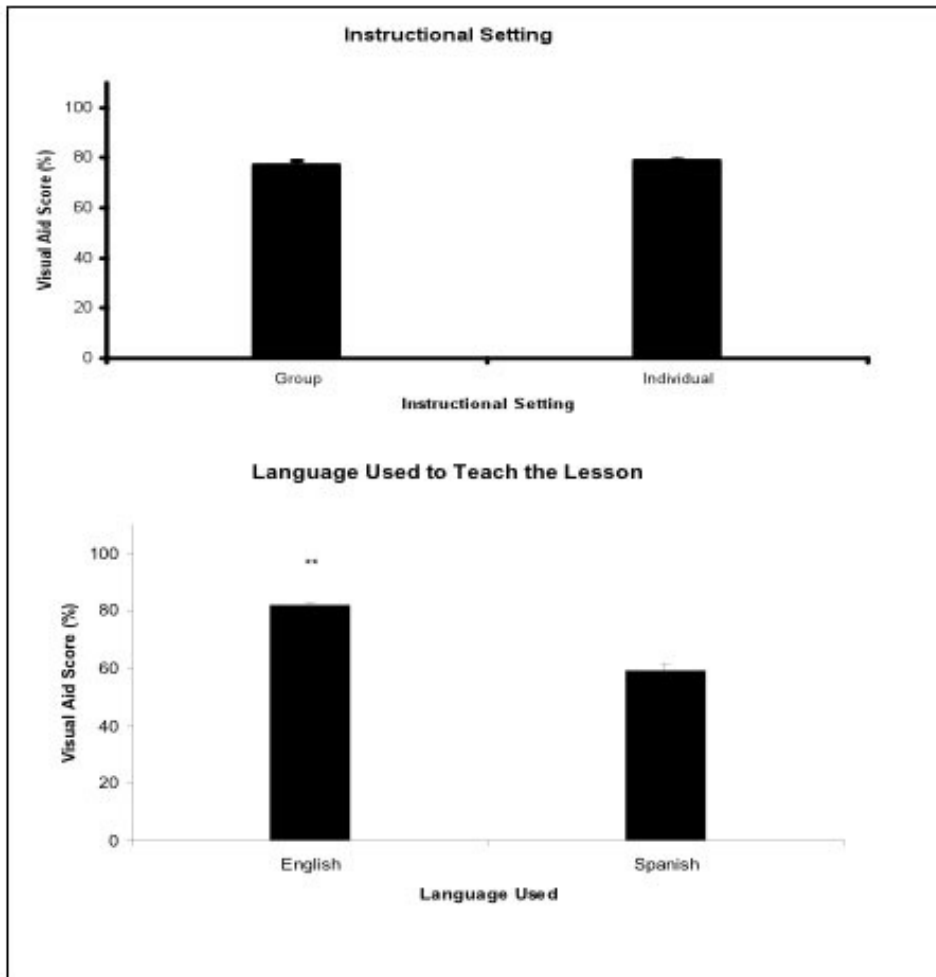
Focus Groups

Group participants were most likely to identify gaining more information about eating healthy as a reason for program participation, whereas individuals identified family well-being and recipes (Figure 5). However, the most common barrier to participation supplied by both instructional settings was time. Factors facilitating program graduation included wanting to learn more for group participants and the flexibility of the program and educator for individual participants. On the other hand, barriers to graduating were lack of child care for group participants and lack of flexibility for individual participants.

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 participants were more likely to report various program aspects as helpful in making lifestyle changes, whereas individual participants gave personal reasons such as self-determination and being unhappy. Group and individual participants responded that it was 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. Overall, participants gave positive responses about the entire program, though group participants tended to have more positive comments than individual participants.

Figure 4.
Visual Aid Score



**p<0.001

Experiential Learning

Experiential activities in ESBA included performing physical activity and tasting or preparing recipes (food experience). There were no significant differences in physical activity or food experience scores by instructional setting or language of lesson delivery (data not shown). Physical activity tended to be used more in the individual setting (87.5%) than in the group (72.7%). Conversely, food experiences tended to be used more in the group setting (54.5%) than the individual (40.6%). Lessons delivered in English tended to have higher scores in both physical activity (88.2%) and food experiences (50.0%) than those delivered in Spanish (66.7% and 22.2%, respectively).

Figure 5.
Focus Group Responses

Reasons for program 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

Barriers to program participation:

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

Factors facilitating program graduation:

- "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

Barriers to program graduation:

- "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

Reasons for making lifestyle changes

- "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

How experiential activities can support making lifestyle changes:

- "[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

Discussion

Qualitative evaluation generates rich descriptions of a sample population categorized into common themes or concepts (Brannen, 1992; Erickson & Roth, 2006; Thomas, 2006) using interviews, observations, focus groups, or existing data sources such as personal journals (Mason, 2002). Qualitative evaluation of EFNEP and FSNE is limited and includes interviews and focus groups with program graduates (Arnold & Sobal, 2000; Brink & Sobal, 1994; Devine, Brunson, Jastran, & Bisogni, 2006; Hartman, McCarthy, Park, Schuster, & Kushi, 1994). The study reported here used focus groups to explore participant perceptions and experiences with the program. Structured observations examined use of learning strategies by EFNEP and FSNE educators, specifically, factors that might influence the use of learning strategies (instructional setting and language used for lesson delivery).

Open-ended questions are a component of adult learning theory and the learner centered approach (Dewey, 1938; Tweedell, 2000; Imel, 1999; Amstutz, 1999; Norris, 2003). This type of question prompts the learner

to use higher levels of cognition (comprehension and application) and use critical thinking skills to apply knowledge they have learned (Badger & Thomas, 1992). They also facilitate the learner-centered approach strategies of activating prior learning (review of previous lessons) and reinforcing learning (reviewing current lesson) (Norris, 2003).

Educators tended to use open-ended questions more in the individual than group instructional setting. Educators may feel uncomfortable or constrained for time to use open-ended questions in group situations where responses can vary greatly and cause learners to diverge from the lesson (Badger & Thomas, 1992). Lessons delivered in Spanish included more total and closed-ended questions than those delivered in English ($p < 0.01$). This is likely related to the fact that only the recipes had been translated into Spanish at the time of the observations; thus, more verbal discussion occurred because lesson materials were being translated by the educator. Securing and maintaining bi-lingual materials and educators is a constant challenge for programs working with low-income audiences (Peggy Martin, personal communication).

Bloom's taxonomy was used in this study to categorize educator-initiated questions by level of cognition (Bloom, 1956). 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 the study reported here, educators were more likely to initiate knowledge rather than application related questions regardless of the question format (open- vs. closed-ended). Application questions are desirable because they help learners transfer information they learn to their personal lives; thus, future training should promote the use of open-ended, application-type questions.

Visual aids in the ESBA curriculum facilitate the learner-centered approach by accommodating a wider variety of learning styles (Norris, 2003). Learning style is defined as the application of cognitive style in a learning situation (Riding & Cheema, 1991). The learning style an individual chooses or tends to use when approaching a learning situation affects achievement of learning outcomes (Cassidy, 2004); learning environments congruent with the preferred learning style increase achievement and positive attitudes toward learning.

Posters, worksheets, and nutrition facts labels used in the ESBA curriculum enhance the experience for visual learners. Rubber bands to determine portion sizes of pasta and miniature pom-poms to count the number of fat grams in a fast food meal aided kinesthetic learners. Visual aids were used significantly more when the lesson was delivered in English ($p < 0.001$). Some visual aids were not language specific (i.e., rubber bands, pom-poms); however, the printed visual aids were not translated into Spanish at the time of the observations, which likely led to less frequent use in Spanish lessons.

Physical activity and food preparation or tasting (food experience) are activities in ESBA that incorporate the experiential learning theory (Dewey, 1938). Experiential learning activities have benefited learners in educational settings other than EFNEP and FSNE, including professional development (Morrison & Estes, 2007), higher education (DiCecco, Wu, Kuwasawa, & Sun, 2007; Teranishi, 2007), and student internship programs (Orkow, 2007). Studies suggest learners gain more knowledge and are able to apply the knowledge from experiential learning, skills that would support the desired behavior changes of EFNEP/FSNE participants.

Structured observations revealed that food experiences were used less often than physical activity. It is possible that educators are more comfortable using physical activity than food experiences; however, previous research with women of similar demographics to the Iowa EFNEP/FSNE educators reported greater self-efficacy toward food- and nutrition-related activities than toward physical activity (Gatewood,

Litchfield, Ryan, Geadelmann, & Pendergast, 2008). However, the previous curriculum used in this EFNEP did not include experiential activities. Thus, it is likely that barriers such as the acquisition, transportation, or time required for food experiences discouraged their use by educators.

There were no significant differences in experiential activities relative to program delivery variables (instructional setting and language of lesson delivery). This is unfortunate in that previous research suggests that Spanish-speaking groups (i.e., Latinos, Mexican-Americans) are kinesthetic, or experiential, learners (Carbone, Lennon, Torres, & Rosal, 2005; Ewing, 1992), and would likely benefit from the use of experiential activities. Future training should promote the use of the experiential activities, particularly among the Spanish-speaking participants.

Adult learning theory and the learner-centered approach purport benefits of a group instructional setting (Henson, 2003; Tweedell, 2000; Imel, 1999; Amstutz, 1999; Norris, 2003). Previous EFNEP and FSNE evaluations suggest effectiveness regardless of instructional settings (group or individual); however, these studies examined only quantitative data from the EFNEP behavior survey and 24-hour recall data. Some suggest improvement is independent of instructional setting (Luccia, Kunkel, & Cason, 2003), while others suggest the individual setting is more effective (Cason, Scholl, & Kassab; Dickin, Dollahite, & Habicht, 2005; Dollahite & Scott-Pierce, 2003). Behavioral outcomes (behavior survey and 24-hour recalls) of the ESBA curriculum by instructional setting (group vs. individual) suggest no difference between the instructional settings (Hoover, Martin, & Litchfield, in press). This was important to the Iowa program, which has seen an increase in the number of participants electing the individual setting, but using a curriculum designed for group instruction.

Those learners preferring a group setting are referred to as "field-dependent learners." Spanish-speaking children have been identified as field-dependent learners; in contrast, Caucasian children are field-independent learners (individual learners) (Dunn & Dunn, 1993). Learning styles remain constant into adulthood (Loo, 1997), so Spanish-speaking participants may prefer and benefit from the group setting. Interestingly, in each of the years examined in this study, lessons delivered in Spanish were predominantly in the individual rather than group setting (60%, 90% and 58% in 2005, 2006, and 2007, respectively; data not shown). In the future, educators may need to consider the documented preferred instructional setting of Spanish-speaking participants and encourage them to participate in the group rather than individual setting.

Structured observations revealed no significant differences in the number of open-ended questions asked, visual aids used, or experiential activities used between group and individual instructional settings. Thus, if any differences in behavior outcomes had been observed between the instructional settings, it would not have been due to differences in delivery of the lesson. Rather, it may be related to educator or participant characteristic(s). Quantitative evaluation of the same audience revealed that educator experience influenced participant behavioral outcomes (Hoover, Martin, & Litchfield, in press).

In addition, "locus of control" of the participant likely influences behavior outcomes. One theme that arose from the focus groups was a difference in the "locus of control" of participants in the individual versus group setting (Rotter, 1966). Participants of the individual setting may have more internal locus of control than group participants. In fact, they may self-select into that setting, preferring to control the day, time and setting of program instruction. In the focus groups, participants of the individual setting were more likely to identify personal attributes leading to successful behavior change and program completion, whereas group participants were more likely to identify program attributes.

Limitations to this study include the following.

- At the time of this study, many of the lesson materials had not been translated into Spanish, which

likely accounts for some of the differences observed between lessons delivered in English and Spanish.

- Structured observations did not equally represent the variables under examination.
 - ◆ The individual instructional setting was observed three times more frequently than the group setting, yet reflects the growing number of participants electing the individual instructional setting (Hoover, Martin & Litchfield, 2008). Group EFNEP lessons are conducted primarily with existing groups (i.e. NEST) and individual participants are encouraged to recruit friends and neighbors to create groups; however, the individual instructional setting is also an option.
 - ◆ Lessons delivered in English were observed three times more often than those taught using Spanish.
 - ◆ Each lesson was not observed in both instructional settings and languages.
- Structured observations were coordinated by educators at times and dates convenient for the participant and educator, giving the researchers little control over these variables.

Implications for these results include the following.

- Intensive, on-going training of educators and their supervisors, particularly the use of open-ended, higher cognition questions (application, synthesis, evaluation), may be needed if educators are to adopt learner-centered facilitation and achieve the desired behavior change in learners (Badger & Thomas, 1992).
- Educators need resources and training, 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 (Torrez, 2000).
- Research on nutrition education needs to further examine: 1) Experiences of different ethnic groups in order to develop and implement culturally relevant and competent nutrition education programs, and 2) Effective learning through use of individual or group setting, instructional methods design, and identifying preferred learning style, which are significant challenges (Curry, 1991).
- Future research should expand what was examined here to other variables that may influence participant behavior change.

Conclusion

In conclusion, the study reported here sought to examine the implementation of specific learning strategies by educators in a new EFNEP curriculum. The use of learning strategies was examined relative to variables thought to impact lesson delivery (instructional setting and language of lesson delivery). Open-ended

questions and experiential learning strategies were not used as often as desired. Training educators to use open-ended, application questioning is particularly important because it encourages higher-level cognition (application), which is more likely to lead to behavior change among participants (Bloom, 1956). Questioning and open-ended questioning were more common in lessons delivered in Spanish, while use of visual aids was more common in lessons delivered in English. However, these differences could be due to the lack of translated materials for lessons delivered in Spanish. Learning strategies did not differ by instructional setting, which suggests the differences in behavioral outcomes (behavior survey and 24-hour recall) reported in the literature are not due to differences in delivery of the lesson but other factors.

Acknowledgements

Thank you to Susan Baker and Barbara Sutherland for writing the ESBA curriculum, and Joyce Greving, Nancy Johnson, Kristin Taylor, and the Iowa EFNEP/FNP program assistants and supervisors for their assistance in implementation of the structured observations.

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