

# Evaluating Extension-Based Adult Education for Agricultural Labor Supervisors

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## Abstract

*Educating farm labor supervisors about the regulations that govern agricultural operations and employment is critical to reducing unintentional violations of workplace safety and labor laws. Cooperative Extension can provide the training needed to professionalize this vital and diverse workforce. One challenge to providing adult education to a wide-ranging audience of labor contractors, crew leaders, and farm managers is implementing a program that meets varied needs and expectations and adapts to linguistic and cultural differences. This study combined quantitative and qualitative methods to measure learning and satisfaction in a bilingual Extension training program and to evaluate the relationship between educational outcomes and program components. The study found that attendees of both the English and Spanish trainings rated the quality of their experience as either high or very high regarding the intensity of learning, the likelihood of implementing what was learned, and their overall satisfaction with the program. Furthermore, post-test scores were significantly higher than pre-test scores for both groups. Nonetheless, English training attendees had significantly higher post-test scores than Spanish training attendees. The study concluded that successful agricultural educational program implementation is tied to adaptive teaching, staffing, and logistical strategies that respond to multicultural realities yet maintain pedagogical standards.*

**Keywords:** cooperative extension, farm labor supervisors, program evaluation, agricultural safety

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Enhancing the knowledge of farm labor supervisors concerning the rules and regulations that govern agricultural operations and employment is critical to reducing unintentional violations of work place safety and labor laws (Roka, Asuaje, & Thissen, 2011; Wiggins, 2009). A farm labor supervisor (FLS) may be a licensed labor contractor, crew leader, field foreman, farm manager or farm owner, but only labor contractors must obtain a valid certificate of registration

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from federal and state agencies and, in most states, they are not required to receive additional instruction after their initial registration<sup>7</sup> (Roka et al., 2011; Roka, Olexa, Smallwood, Polopolus, & Fountain, 2009b). Nevertheless, supervisors in the field as well as growers and small subcontractors are all subject to the penalties of local, state, and federal laws protecting agricultural labor (see Roka et al., 2009a). Extension education programs can provide the training needed to professionalize this vital and diverse part of the workforce, integral to the nation's multibillion dollar agricultural industry. Yet a challenge to providing agricultural education to FLSs, many of whom are foreign-born and have received different levels of education in the US and abroad, is implementing an efficacious training program that not only results in knowledge gains but meets varied needs and expectations and adapts to linguistic and cultural differences.

Evaluation provides data that can ensure an agricultural education program offered through Cooperative Extension Services is targeted to client needs (Boone, Safrit, & Jones, 2002; McClure, Furhman, & Morgan, 2012), remains current (Yang, Fetsch, McBride, & Benavente, 2009), and continues to attract audiences, particularly if it is to expand (Broun, Nilon, & Pierce II, 2009). Nonetheless, the Extension literature reveals deficiencies in evaluation research (Duerden & Witt, 2012; Lamm & Israel, 2011; McClure et al., 2012) and has called for more rigorous analyses of program evaluation data (Braverman & Engle, 2009; Duerden & Witt, 2012; Lamm, Israel, & Harder, 2011). In response, this study combined ethnographic field methods and quantitative survey research to establish the effectiveness and quality of a bilingual Extension-based, adult-education program for FLSs, assessing the relationship between educational outcomes and program components.

The program was developed in 2010 to provide a unified context under which agricultural labor contractors, crew leaders, field foremen, farm managers, and farm owners in Florida could better understand their roles and responsibilities in employing and managing farmworkers. With the guidance of an organizing committee made up of growers, labor contractors, worker advocacy representatives, and compliance officers from both federal and state agencies, faculty from a land-grant university designed a core curriculum comprised of four training modules in both English and Spanish: 1) Wage and Hour, 2) Human Resource (HR) Compliance, 3) Worker Protection Standard (WPS), Field Sanitation, and Food Safety, and 4) Safe Driving. The four modules are taught in a one-day certification training by a team of experts and trainers that includes specialized Extension agents, Department of Agriculture inspectors, Department of Transportation and Department of Labor officers, insurance adjusters, and former agricultural labor supervisors. The trainings have been offered since 2010 at county Extension offices and Research and Education Centers (RECs) throughout Florida. Yet a goal of the program is to expand its audience and educational modules in the future by offering the training in electronic format.

The study reported here consisted of an external evaluation of the seven trainings offered during the fall of 2012. The evaluation was designed by an agricultural education program evaluation specialist and conducted by a bilingual (English/Spanish) team of agricultural education and communication faculty and research staff.

### **Conceptual Framework**

Evaluation has evolved from being a necessity to being a priority in Extension, particularly as a tool for providing evidence of programmatic worth (Lamm & Israel, 2011). By documenting positive impacts on clients, Extension ensures its programs remain relevant to

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<sup>7</sup> In California, farm labor contractors must annually enroll and participate in at least 8 hours of educational classes approved by the Labor Commissioner in partial fulfillment of state license renewal requirements (Cal. Lab. Code § 1684, 2011).

audiences and accountable to funders. Built into the design of an educational program, evaluation can also be used to examine the extent to which goals are being met, identify strengths and weaknesses, and provide information that can be used to improve outcomes (Frechtling, 2010; McNamara, 2006; Patton, 2008; Roucan-Kane, 2008).

Duerden and Witt (2012) note that while outcome evaluations have become the norm across most Extension programs, they often fail to link observed outcomes to program components. This results in *black-box outcome studies* where program outputs are examined without examining internal operations and processes (Mowbray, Holter, Teague, & Bybee, 2003; Muñoz, 2005; Patton, 2008). Patton (2008, p. 327) and Karachi, Abbott, Catalano, Haggerty, and Fleming (1999, p. 711) call for “getting inside and opening up the black box” by examining issues of program implementation. Incorporating program implementation findings can provide Extension educators with additional insight into how their programs are being conducted and help them identify effective practices (Duerden & Witt, 2012; Rossi, Lipsey, & Freeman, 2004). For example, a program’s targeted outcomes may be tied to the quality of its staff training. Thus, assessing implementation data can lead to a more accurate report and replicable methodology of a program’s production of observed outcomes.

As early as 1978, Patton observed that outcome evaluations, represented by performance on standardized achievement tests, predominated in education while information about the actual nature of the programs being evaluated might be missing (Patton, 1978, p. 153). He emphasized, “where outcomes are evaluated without knowledge of implementation, the results seldom provide a direction for action because the decision maker lacks information about what produced the observed outcomes (or lack of outcomes)” (Patton, 1978, p. 155). An evaluation that focuses entirely on program outcomes, i.e. the extent to which the program was effective in changing behaviors or increasing knowledge, cannot answer why a program is effective or ineffective (Patton, 1978, p. 150). According to Patton, the ideal evaluation includes assessments of both implementation and outcome data.

While Patton (1978, 2008) distinguishes between implementation and outcome evaluations, Frechtling (2010) further distinguishes between implementation and progress evaluations. Both are formative in that they provide information for program improvement, yet an implementation evaluation assesses whether a program is being conducted as planned whereas a progress evaluation assesses whether a program is meeting its ultimate goals (Frechtling, 2010). The latter “collects information to determine what the impact of the activities and strategies is on participants, curricula, or institutions at various stages of the intervention,” providing relatively early indicators of unexpected deviations that can be used to fine-tune it (Frechtling, 2010, p. 9).

A set of questions guides each type of evaluation (Frechtling, 2010; Patton, 2008). Implementation evaluations are guided by questions that address, for example, educational program participant selection, recruitment activities, participation incentives, and program management. Progress evaluations, on the other hand, are guided by questions that address participant interest and performance, program expansion, and short-term participant impacts in light of long-term program goals.

Additionally, Frierson, Hood, and Hughes (2010) maintain that taking into account the social and cultural milieu surrounding an educational program and its participants greatly enhances implementation and progress evaluation products. Culturally-responsive evaluation does not consist of a distinct set of steps, they argue, but rather represents a holistic framework that considers diverse voices and perspectives. The approach requires that evaluators “critically examine culturally relevant but often neglected variables in program design and evaluation” (Frierson et al., 2010, p. 76). Remaining responsive to the role of culture and the needs of the target population increases the effectiveness of a program and its evaluation. Moreover, Bryson and Patton (2010, p. 34) note that demonstrating cultural sensitivity and competence makes evaluation credible to people from different backgrounds.

Frierson et al.'s (2010) and Bryson and Patton's (2010) arguments are relevant to university Extension programs which, generally, have been critiqued for their structural barriers to partnerships with underserved groups (e.g. Hassel, 2004; Klemme, Hausafus, & Shirer, 2005). Thering (2009) adds that in both program development and evaluation processes, Extension professionals must increasingly identify and overcome a spectrum of barriers formed by culture, class, ethnicity, race, and/or language if they are to produce intended educational and community capacity building outcomes. Thus, while analyzing the relationship between the components and outcomes of a program within a culturally-responsive framework increases the utility of evaluation products and, potentially, of the program itself—it remains a challenge to agricultural Extension educators.

### **Purpose**

The purpose of this study was to evaluate the current effectiveness and quality of the bilingual Extension-based, adult-education program for FLSs (FLS training program) by measuring reception to, and knowledge gained in, the trainings offered during the fall of 2012 and by comparing educational outcomes to program components. The study assessed implementation, progress, and outcome data. In assessing the implementation of the program, the study was guided by the following questions:

- Were the curriculum and training staff properly developed?
- Were suitable recruitment strategies used?
- Did the logistics of the training sessions meet and accommodate the practical needs of participants?
- Were teaching materials and approaches tailored to participants?

To appraise the progress of the program, the study addressed the following questions:

- Are program participants enhancing their skills and gaining knowledge?
- Are the trainings producing sufficient satisfaction to ensure participation is maintained or increases?

To measure the educational outcomes of the program, the study focused on the following questions:

- What is the level of participant proficiency in the training material?
- What is the quality of participant experience regarding the intensity of learning, the likelihood of implementing what was learned, and their overall satisfaction with the program?

These questions were addressed within a culturally-responsive framework that took into consideration cultural factors potentially impacting program components and educational outcomes.

### **Methodology**

#### **Data Collection**

Data were collected through participant observation and survey research (Bernard, 2006) during the seven trainings offered in both English and Spanish in the Florida cities of Homestead, Immokalee, Wimauma, Arcadia, Fort Pierce, Sebring, and Belle Glade from September 11 to October 31, 2012. Participant observation was used to address three of the eight guiding questions: whether the curriculum and training staff were properly developed, whether suitable recruitment strategies were used, and whether teaching materials and approaches were tailored to

participants. Survey research was used to gauge participant response to, and knowledge gained in, the trainings. The questionnaires addressed five of the eight guiding questions: whether the logistics of the training sessions accommodated the practical needs of participants, whether participants enhanced their skills and knowledge, whether the trainings were satisfying and well-attended, what the levels of participant proficiency in the training materials were, and what the quality of participant experience was regarding the intensity of learning, the likelihood of implementing what was learned, and their overall satisfaction with the program.

Participant observation, conducted at all the trainings, was important to understanding the relationship between program implementation and educational outcomes. Because it involved not merely observing but taking part in the activities of the trainers and attendees, participant observation provided an insider's view into the operation of, and reception to, the trainings. Members of the evaluation team sat in the audience through each of the trainings, observing and taking notes on training content, teaching methods and media, trainer expertise, and attendee response. They noted questions and comments brought up by members of the audience and how these were addressed by instructors. They interacted with program participants, trainers, sponsors, extension agents, and regulatory officers. They helped program staff set up training equipment and register attendees. Thus participant observation afforded data collection that complemented and contextualized survey research. Combining the two methods triangulated the data collected and increased the likelihood of producing trustworthy findings (Lincoln & Guba, 1985). As Bernard (2006, p. 368) notes, "there are many things that people can't or won't tell you in answer to questions." He emphasizes, "participant observation makes it possible to collect quantitative survey data...qualitative and quantitative data inform each other and produce insight and understanding in a way that cannot be duplicated by either approach alone" (Bernard, 2006, p. 356).

Members of the evaluation team were bilingual and rotated as participant observers in the English and Spanish-led trainings. Rotation ensured the use of multiple observers across languages and improved the probability of credible results (Lincoln & Guba, 1985). At least two members attended each of the seven trainings, with one attending the sessions delivered in English and the other attending the sessions delivered in Spanish at each location. Over the course of the training season, each member of the evaluation team had the opportunity to observe the trainings delivered in both languages.

Observations were recorded as descriptive field notes (Bernard, 2006) and shared with other members of the evaluation team via e-mail following each of the trainings. The notes included the participant observer's account of training activities, materials, and methods as well as a list of questions and answers exchanged between the audience and instructors. The latter were written in the language and words in which the exchange occurred. Hence descriptive field notes documented details about teaching performance and audience response not easily captured by survey research. Later, these notes would help explain, for example, variations in survey responses and posttest scores.

Survey questionnaires were developed in English and translated to Spanish by a bilingual native Spanish speaker with experience working with Florida crew leaders. The translations were reviewed by two biliterate members of the evaluation team. Surveys were piloted in Homestead, Florida to ensure comprehension by the target audience.

Survey questionnaires were collectively administered by members of the evaluation team at the beginning and at the end of all trainings using Microsoft Office PowerPoint™ slides and TurningPoint™ software and equipment<sup>8</sup>. Gathered attendees were handed TurningPoint ResponseCard keypads ("clickers"), instructed in their use, and asked to respond to items appearing on the projector screen by pressing on their clickers the number corresponding to the

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<sup>8</sup> TurningPoint software and equipment refers to audience response technology, i.e. ResponseCard keypads, receivers, and software, created by Turning Technologies to facilitate data collection and assessment.

best answer for each question. Items were formatted as multiple choice and true or false questions in the language the training was delivered in and read out loud from each of the PowerPoint slides.

The pre-training questionnaire focused on demographic information and tested attendees on their familiarity with the training topics. It was composed of 19 items. The first 2 items, innocuous questions on gender and training location, were used as practice questions by displaying the results on the projector screen to ensure clickers were being used properly. Responses to the second item were also used to record attendance. The next 5 items included questions regarding years in agriculture, crops worked with, employment position, employees supervised, and attendance requirement. The remaining 12 items consisted of test questions regarding the topics of the four training modules: Wage and Hour; HR compliance; WPS, Field Sanitation and Food Safety; and Safe Driving.

The post-training questionnaire was composed of 27 items and focused on self-reported knowledge levels, overall satisfaction with the training, and again tested attendees on their knowledge of the training topics. The first 8 items, constructed in pairs using Likert scales, consisted of before-and-after questions regarding knowledge gained in each of the core units of the training. The next 12 items consisted of test questions regarding the training topics. The last 7 items, 5 of which were Likert items, included questions regarding satisfaction with the organization, expertise, and location of the training as well as questions regarding expectations, intensity of learning, likelihood of implementing what was learned, and recommending the training to others.

Following each of the trainings, members of the evaluation team exchanged data and notes. Telephone meetings were held to discuss observations, trends, and logistical issues. Questionnaire items were modified to reflect realities on the ground as the study progressed. For example, some questionnaire items were shortened after the pilot training to facilitate response selection.

## Data Analysis

Data collected through participant observation and recorded as descriptive field notes were logged by training location and module and organized according to evaluation research domains (Bernard, 2006). For instance, the quality and consistency of training content and delivery, nature of audience participation, and logistics were indexed for each of the four modules presented at each of the seven trainings. These indexes were used as references against which sessions could be compared and assessed and also provided a backdrop for survey results. As an example, the Wage and Hour and HR Compliance modules delivered by a local HR expert at the Immokalee Spanish training session generated a great deal of audience interest and interaction as did the WPS, Field Sanitation, and Food Safety module delivered by a regional specialized Extension agent. The quality of the training content, teaching methods, and audience participation indexed for those sessions later helped explain Immokalee's relatively higher posttest scores compared to the other trainings delivered in Spanish (see Figure 4).

Data collected through PowerPoint questionnaires were captured by TurningPoint receivers and automatically saved into a Microsoft Office Excel™ database. The TurningPoint software program coded data according to ResponseCard serial numbers and questionnaire item numbers and was also used to grade responses to the 12 pre-training and 12 post-training knowledge test questions.<sup>9</sup> Pre-training and post-training knowledge test scores, calculated by the program as a percentage of correct responses, were generated for all attendees participating in the pre- and post-training surveys.

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<sup>9</sup> Responses to one pre-training and one post-training knowledge test question, whose multiple-choice options were incomplete, were eliminated from final test scores.

Frequency distributions were used to capture trends in the responses to questions regarding demographics, satisfaction with the training, likelihood of implementing what was learned, and intensity of learning and to illustrate performance on post-training knowledge tests. Trends were disaggregated by attendance in trainings conducted in English and attendance in trainings conducted in Spanish. Available responses were counted for ( $n = 260$ ) pre-training and ( $n = 218$ ) post-training survey participants.

In addition to summarizing the data through descriptive statistics, inferential statistics, in this case  $t$ -tests and multiple regression analysis, were used to draw conclusions about the values of the summary descriptions and, in turn, about the quality of the training program. Dependent and independent means  $t$  tests in SPSS™ were used to compare overall pre-training knowledge test scores to overall post-training knowledge test scores and to compare test scores for participants attending the trainings in English to test scores for participants attending the trainings in Spanish, respectively. This was done to assess statistical differences in the average test performance of participants before and after the trainings and between the English and Spanish sessions. A sample size of  $n = 157$ , the number of attendees who participated in both the pre- and post-training surveys and did not omit responses to demographic survey questions, was used for the  $t$  tests.

Multiple regression analysis in SPSS was used to identify factors associated with post-training knowledge test scores. This was done to judge whether program or non-program variables contributed to differences in the average test performance of participants in dependable ways. This type of analysis was feasible because the dependent variable was a continuous, quantitative variable while the independent variables were either continuous quantitative variables or categorical variables dummy-coded as 1 or 0. The independent variables selected to estimate post-training knowledge test scores included pre-test scores, gender, crops worked with, years in agriculture, employment position, employees supervised, whether the training was taken in English, whether the training was taken as a requirement, and whether the training met attendee expectations.

Variance inflation factors (VIF), used as a diagnostic tool, were calculated to detect the presence of multicollinearity among the predictor variables. Serious multicollinearity tends to make regression coefficients imprecise (Kutner, Nachtsheim, Neter, & Li, 2005). VIF values indicate “how ‘inflated’ the variance of the coefficient is, compared to what it would be if the variable were uncorrelated with any other variable in the [regression] model” (Allison, 1999, p. 48). VIF values greater than 10 indicate severe multicollinearity (Kutner et al., 2005). However, in this case, VIF values were all under five, with a mean of 2.33. Kutner et al. (2005) point out:

The fact that some or all predictor variables are correlated among themselves does not, in general, inhibit our ability to obtain a good [regression line] fit nor does it tend to affect inferences about mean responses or predictions of new observations, provided these inferences are made within the region of observations. (p. 283)

Moreover, omitting from the regression model variables whose associations with the dependent variable are not significant can result in omitted variable bias, particularly when independent variables synergistically affect the dependent variable.

Because not all attendees remained for the duration of the trainings, only  $n = 195$  attendees participated in both the pre- and post-training surveys. Of those attendees,  $n = 38$  attendees did not provide responses regarding one or more of the regression model predictors. Thus, a sample size of  $n = 157$  was used for the regression model.

## Results

### Training Recruitment, Content, and Delivery

Participant observation and discussions with staff revealed attendees were recruited through announcements posted on county Extension office and REC websites, in agricultural publications, and in pamphlets mailed to agribusinesses. Attendees were also recruited through Extension exhibits at agricultural events, such as the Citrus Expo, and through phone calls. Registration was available per training module, meaning attendees had the option to register for only those sessions they wished to participate in. The duration of each session was two hours and the price of each session was \$10.00 on the registration forms. Attendance was expected to average 20 individuals per session. More than 300 individuals attended at least one class and 221 individuals completed the day-long training program. The average number of attendees present at the beginning of the training sessions delivered in English and Spanish was 18 and 19, respectively. The average number of attendees present at the end of the training sessions delivered in English and Spanish was 12 and 19, respectively.

Participant observation also revealed that training content and material, such as information presented on PowerPoint slides and handouts, were standardized in both languages<sup>10</sup>. Images were incorporated in the slides to facilitate comprehension and questions were incorporated to encourage discussion. Trainers were linguistically and culturally fluent in the communication and relational style of attendees. Several trainers were themselves foreign-born and had field and supervisory experience in agricultural work. The delivery of the presentations, however, varied by trainer. Some trainers did not use all of the information on the PowerPoint slides. Moreover, trainers in the sessions delivered in English often exhibited greater understanding of training topics and teaching methods than trainers in the sessions delivered in Spanish.

### Attendee Demographics

Attendee survey responses to demographic questions ( $n = 260$ ) indicated training attendance, as a whole, was mostly comprised of individuals who have worked in agriculture for more than 10 years. The sex ratio of training attendance was roughly 3 males to 1 female, overall. Almost half of all attendees were crew leaders and contractors. Twenty-two percent were employed as office staff, 10% as farm staff, 8% were employed in positions not listed on the survey, 7% were CEOs or owners, and 5% did not respond to the survey item regarding employment position.

Many individuals who attended the trainings were directly responsible for a large number of employees. Twenty percent of attendees were directly responsible for more than 80 people. Fourteen percent were responsible for anywhere between 31 to 80 people. Another 14% were responsible for 21-30 people, 14% were responsible for 11-20 people, and 15% were responsible for up to 10 people. Fifteen percent were not responsible for any employees and 7% did not report how many employees they were responsible for.

Crops attendees most worked with were fruit trees, vegetables, and melons. More than half of all attendees worked with fruit trees, such as citrus, mango, and avocado, and almost a third worked with vegetables and melons, such as peppers, tomatoes, zucchini, and cantaloupe. Four percent of attendees did not work directly with crops and 5% did not provide the information. The remaining attendees worked with berries, ornamentals, and other agricultural products such as corn, sugarcane, sorghum, and livestock.

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<sup>10</sup> With the exception of several short videos shown in English during the Safe Driving sessions, the trainings were conducted in Spanish.



**Attendee Reception to the Trainings**

Attendee survey responses rating their experience regarding the intensity of learning, the likelihood of implementing what was learned, and their overall satisfaction with the program ( $n = 218$ ) were summed and are illustrated in Figures 1 and 2. As a whole, attendees of both the English and Spanish training sessions rated the quality of their experiences as either high or very high. Discussions with attendees likewise revealed positive reception to the trainings. Attendees generally reported that the training material, both in English and Spanish, was useful. Participant observation indicated attendees showed interest in the topics during presentations with questions and discussions.

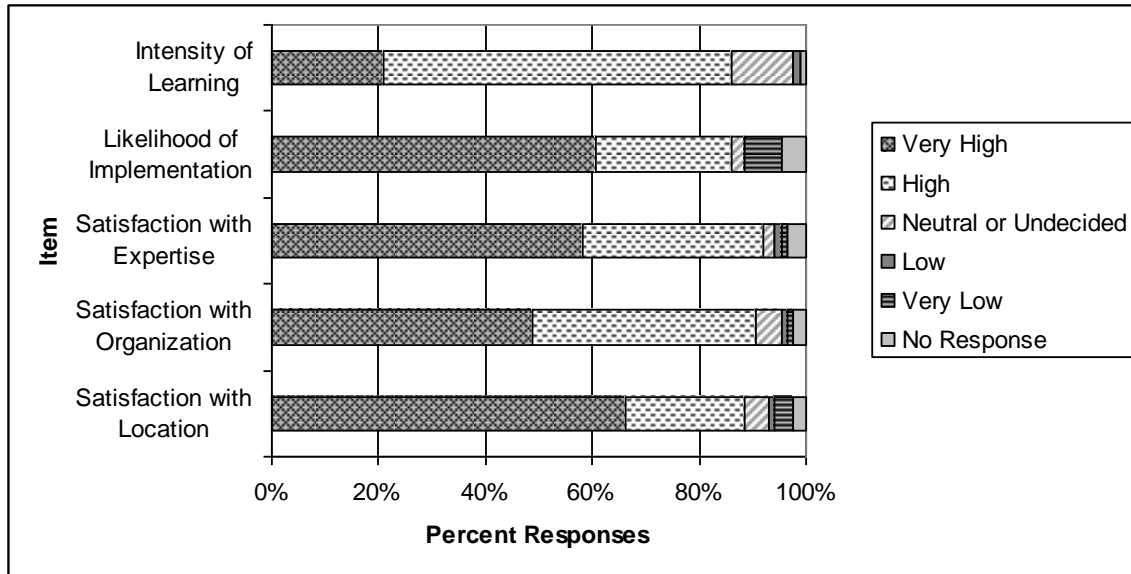


Figure 1. Relative Frequency Distribution of Attendees' Quality of Experience Regarding the Intensity of Learning, the Likelihood of Implementing What Was Learned, and their Overall Satisfaction with the Trainings Delivered in English ( $n = 86$ ).

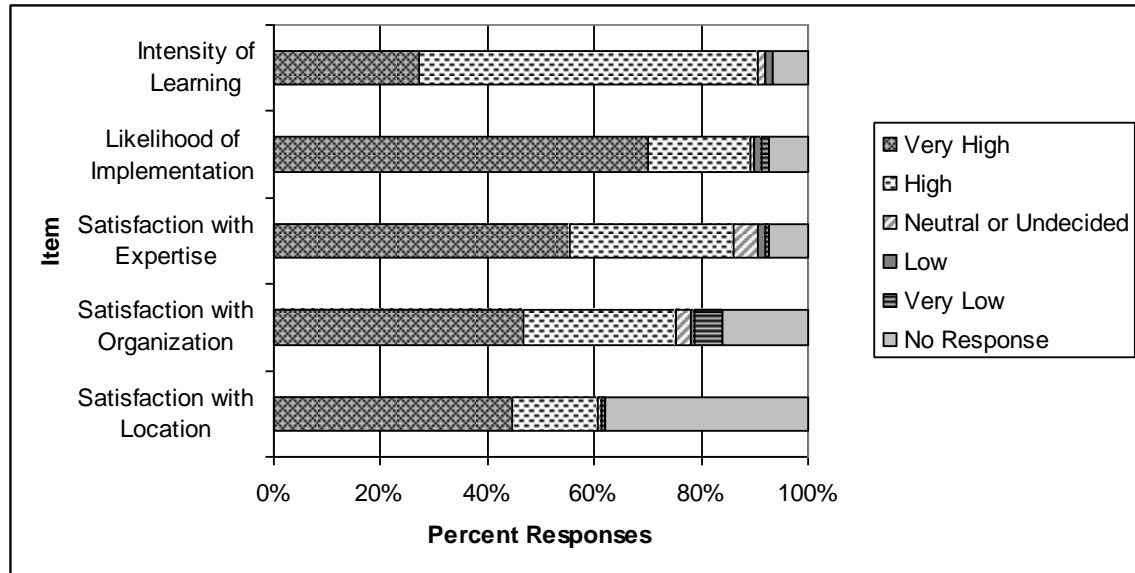


Figure 2. Relative Frequency Distribution of Attendees' Quality of Experience Regarding the Intensity of Learning, the Likelihood of Implementing What Was Learned, and their Overall Satisfaction with the Trainings Delivered in Spanish ( $n = 132$ ).

### Attendee Knowledge Change at the Trainings

The results of overall attendee performance on the post-training knowledge tests ( $n = 218$ ) are illustrated in Figures 3 and 4. The charts indicate the percent of correct responses and the percent of incorrect responses scored at the end of each training conducted in English and Spanish. For example, individuals who attended the Arcadia training conducted in English responded correctly to 80% of the questions. On the other hand, individuals who attended the Homestead and Sebring trainings conducted in Spanish responded correctly to 45% of the questions, respectively. Generally, individuals who attended the trainings conducted in English more frequently responded correctly to post-training test questions than did individuals who attended the trainings conducted in Spanish. The highest percent of correct responses at the trainings conducted in Spanish, 63% in Immokalee, was only 2 percentage points higher than the lowest percent of correct responses at the trainings conducted in English, 61% in Homestead. The average percent of correct responses scored at the trainings conducted in English and Spanish were 71% and 54%, respectively.

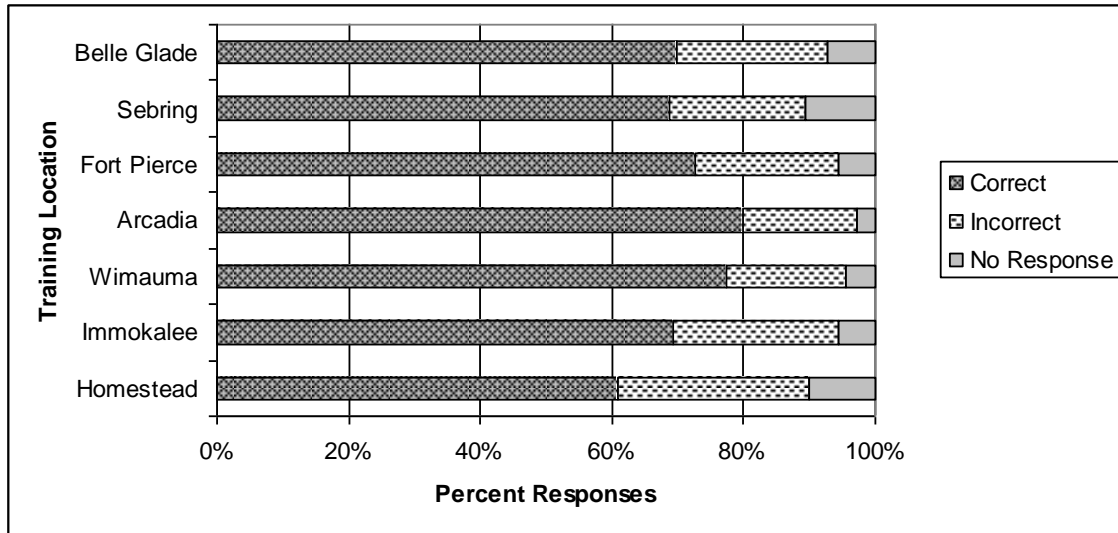


Figure 3. Relative Frequency Distribution of Attendee Performance on (English) Post-Training Test ( $n = 86$ ).

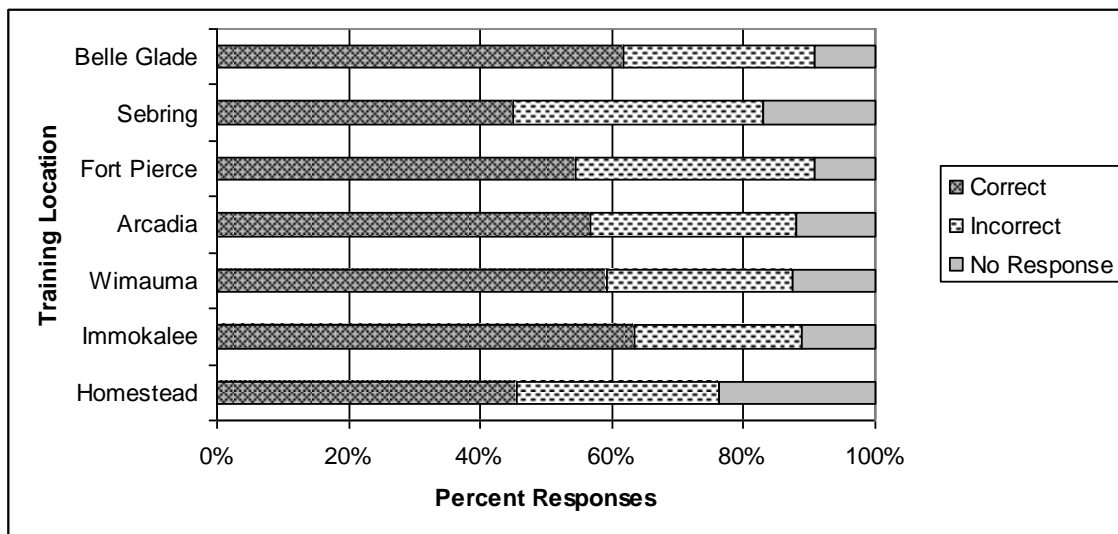


Figure 4. Relative Frequency Distribution of Attendee Performance on (Spanish) Post-Training Test ( $n = 132$ ).

Likewise, results of an independent means *t* test performed on ( $n = 157$ ) post-training knowledge test scores (homogeneity of variance assumed,  $F(1, 155) = .19, ns$ ) indicate that, on average, participants attending the trainings conducted in English had higher post-training knowledge test scores ( $M = 0.78, SE = 0.02$ ) than participants attending the trainings conducted in Spanish ( $M = 0.64, SE = 0.02$ ). This difference was significant ( $t(155) = 5.74, p < .001; r = .42$ ). Yet results of an independent means *t* test performed on ( $n = 157$ ) pre-training knowledge test scores (homogeneity of variance assumed,  $F(1, 155) = .34, ns$ ) indicate there was no significant difference ( $t(155) = 0.48, ns$ ) between the scores of participants attending the trainings conducted in English ( $M = 0.58, SE = 0.02$ ) and the scores of participants attending the trainings in Spanish ( $M = 0.57, SE = 0.02$ ). Nonetheless, results of dependent means *t* tests indicate that, on average, post-training knowledge test scores were significantly higher than pre-training knowledge test scores for participants attending the trainings conducted in both English (post-test score  $M = 0.78, SE = 0.02$ ; pre-test score  $M = 0.58, SE = 0.02$ ;  $t(64) = -9.87, p < .001, r = .78$ ) and Spanish (post-test score  $M = 0.64, SE = 0.02$ ; pre-test score  $M = 0.57, SE = 0.02$ ;  $t(91) = -4.62, p < .001, r = .44$ ).

Results of multiple regression analysis ( $n = 157$ ) show whether program or non-program (i.e. demographic) factors were contributing to differences in English and Spanish post-training knowledge test scores. Results, illustrated in Table 1, indicate attendance in the trainings conducted in English was significantly and positively associated with post-training knowledge test scores and their best predictor ( $p < 0.001$ ). Pre-training knowledge test scores were also significantly and positively associated with the dependent variable ( $p < 0.001$ ). However, the remaining variables were not significantly associated with post-training knowledge test scores.

Table 1

*Multiple Regression Analysis for Post-training Knowledge Test Score (n = 157)*

| Predictor                                  | <i>B</i> | <i>SE B</i> | $\beta$ |
|--|----------|-------------|---------|
| (Constant)                                 | 0.44     | 0.11        |         |
| Pretest Score                              | 0.34     | 0.08        | .30*    |
| Attended training delivered in English     | 0.12     | 0.03        | .38*    |
| Male                                       | 0.04     | 0.03        | .12     |
| Work with fruit trees                      | 0.03     | 0.03        | .09     |
| Work with vegetables and melons            | 0.03     | 0.04        | .10     |
| 1-5 years agricultural experience          | 0.06     | 0.06        | .12     |
| 6-10 years agricultural experience         | 0.06     | 0.06        | .13     |
| More than 10 years agricultural experience | 0.03     | 0.05        | .08     |
| Employed as a crew leader or contractor    | -0.04    | 0.05        | -.13    |
| Employed as office staff                   | 0.05     | 0.05        | .12     |
| Employed as farm staff                     | -0.04    | 0.05        | -.09    |
| Employed as a CEO or farmer                | -0.07    | 0.07        | -.09    |
| Oversee over 80 workers                    | 0.03     | 0.03        | .07     |
| Company required attendance                | -0.02    | 0.03        | -.06    |
| Training met expectations                  | -0.05    | 0.08        | -.05    |

Note:  $R^2 = .35$ .

\*  $p < .001$ .

## **Conclusions and Recommendations**

The results of this study point to several findings. First, and most importantly, individuals participating in the FLS training program are learning. Attendees scored significantly higher in post-training knowledge tests than in pre-training knowledge tests regardless of the language the training sessions were delivered in.

Secondly, individuals are satisfied with the quality of their learning in the FLS training program. Attendees of both the English and Spanish training sessions rated the quality of their experience as either high or very high regarding the intensity of learning, the likelihood of implementing what was learned, and their overall satisfaction with the program. Components such as program organization, staff expertise, and training location contributed to this satisfaction. Moreover, the flexibility of the training schedule, the affordability of the sessions, and the affinity between the trainers and attendees were conducive to practical and motivational satisfaction.

Nonetheless, a third finding is that attendees in the English training sessions had significantly higher post-test scores than attendees in the Spanish training sessions. The difference in knowledge gains can be partly explained by variations in the delivery of training material between languages. Trainers in the sessions delivered in Spanish, particularly those who did not help create the PowerPoint slides used in the program, were not consistent in presenting all of the information on the slides. Furthermore, the sessions delivered in English benefitted from a greater level of subject-matter expertise.

Another potential explanation for the difference in knowledge gains is that demographic factors not captured by the study's instruments may have partly contributed to learning differences; these factors may include diverse learning styles and needs, or just being more or less accustomed to traditional Extension learning environments. For example, the study's surveys lacked items regarding education and income levels. However, there was no significant difference between pre-training knowledge test scores for attendees participating in the sessions delivered in English and attendees participating in the sessions delivered in Spanish.

Thus, greater standardization of content delivery and staff development is recommended for the FLS training program. Staff should be further instructed in the teaching material, particularly regulations affecting agricultural personnel management and general administration. Staff should also be trained in effective pedagogical techniques. Yet the effectiveness of the FLS training program, underscored by its educational outcomes, is clearly tied to program components such as curricular quality, culturally and linguistically diverse staff, bilingual content development and delivery, and practical logistical strategies.

Together, these results address the research questions that guided the evaluation. Participant observation revealed that despite delivery variations across languages, 1) the training modules were well developed, 2) recruitment strategies resulted in expected attendance rates, and 3) teaching materials and media, because they were varied and facilitated comprehension through the use of images, were tailored for a variety of education levels. Survey responses indicated 4) the training sessions generally met and accommodated the practical needs of participants and resulted in overall high 5) satisfaction with the program 6) and quality of experience regarding the intensity of learning and the likelihood of implementing what was learned. Post-test scores revealed 7) participant levels of proficiency in the training material and indicated 8) the program results in significant knowledge gains.

## **Discussion and Implications**

FLSs are responsible for complying with complex labor laws and ensuring safe work environments for thousands of farmworkers. Providing them with adequate knowledge and skills is critical to upholding employment standards, preserving worker health, and reducing unintentional regulatory violations (Roka et al., 2011). By offering instruction on safety and compliance the FLS training program is helping to improve workplace conditions and professionalize the industry.

Comprised of labor contractors, crew leaders, field foremen, farm managers and farm owners of various cultural backgrounds, FLSs represent a diverse group that is directly involved with managing vulnerable populations working in agriculture. This is significant not only for the agricultural industry but for Cooperative Extension. Hassel (2004), Klemme et al. (2005), and Thering (2009) have all noted that barriers formed by culture, class, ethnicity, race, and/or language differences impede partnerships with underserved groups. As this study has demonstrated, cultural and linguistic responsiveness is an essential program component that facilitates Extension collaborations with underserved audiences and ensures effective agricultural education. From an evaluative perspective, it is a replicable approach that can serve to improve the targeted outcomes of additional programs in other states.

However, bilingual content and delivery do not guarantee expertise is translated. Linguistic and cultural responsiveness must be tied to the feedback mechanisms provided by program evaluation to ensure consistent curricular quality and equitable knowledge gains. This study contributes to both the evaluation and Extension literature by showing that successful agricultural educational program implementation is tied to adaptive teaching, staffing, and logistical strategies that respond to multicultural realities yet maintain pedagogical standards.

In illustrating how the FLS training program's educational outcomes are linked to its operation, the study confirms the necessity of conducting evaluations that analyze program implementation data (Duerden & Witt, 2003; Mowbray et al., 2003; Patton, 2008). Pretest-posttest design is important in gauging whether an agricultural education intervention is effective but not sufficient in assessing how or why. By using a mix of methods that combined participant observation with survey research, this study traced linkages between training delivery and participant impacts that may not have been captured by an outcome evaluation.

The study also analyzed progress data by examining the FLS training program's participant attendance rates, satisfaction levels, and knowledge gains. Frechtling (2010) has found progress data can provide timely identification of programmatic weaknesses. Here, the analysis provided an early indicator that participant knowledge gains could be improved in the trainings delivered in Spanish, a finding that can be used to fine tune the program's achievement of meeting the educational needs of a critical segment of the industry's labor force. Again, an outcome evaluation alone may not have provided the information necessary to strengthen the program nor addressed the critical question underlying any Extension effort: Is this program worthy of continuity or expansion?

In this case, expanding the FLS training program should be a priority. Investigating the feasibility of providing the training in an electronic format for wider and more accessible statewide delivery is an area recommended for further study. Online video streaming and DVD recordings of the training may prove to be cost-effective methods of overcoming time restrictions potentially preventing increased program participation.

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