

# ASSESSING A FOOD SAFETY TRAINING PROGRAM INCORPORATING ACTIVE LEARNING IN VEGETABLE PRODUCTION

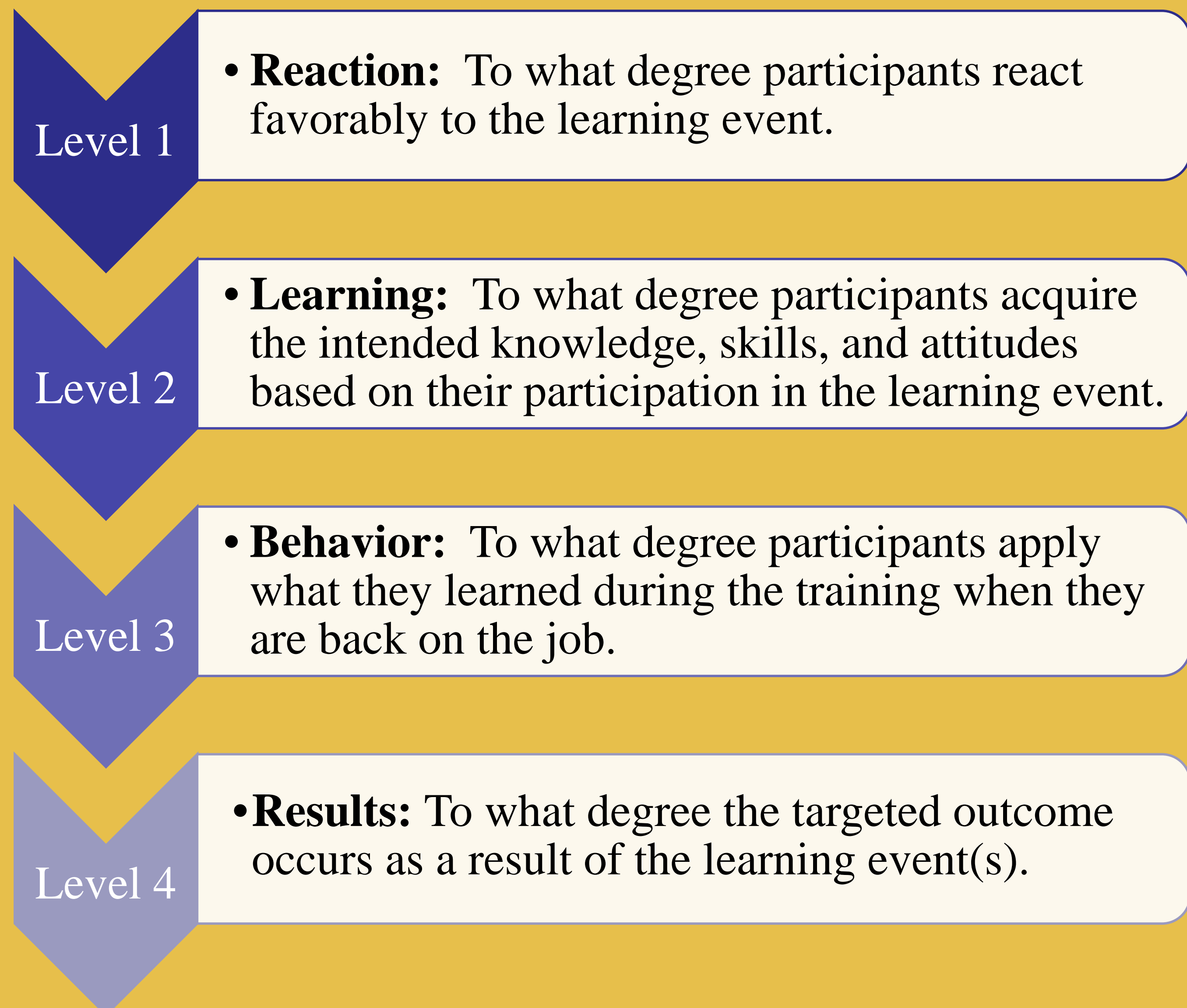
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## Introduction

- Gilliss (2011) reported that “contaminated food consumed in the United States causes an estimated 48 million illnesses, 128,000 hospitalizations, and 3,000 deaths annually” (p. 749).
- The risk of contaminated food reaching consumers can be reduced by the use of food safety training programs.
- As the number of vegetable consumers increases (Parker, Wilson, LeJune, & Doohan, 2012) and the consumers’ concern for quality food grows (Miles et al., 2004), there is a need to improve food handler training programs.

## Theoretical Framework

Kirkpatrick’s model of training evaluation was widely used in industry for evaluating training programs. The model highlighted four program evaluation levels: reaction; learning; behavior; and results.



## Methods

- The research purpose was to determine the influence of active learning strategies on the food safety training program among vegetable packing employees using Kirkpatrick’s four level model of training evaluation.
- This research incorporated mixed-methods to utilize each level of Kirkpatrick’s model.
- Sixty-one ( $N = 61$ ) subjects from one vegetable packaging facility participated in the assessment.
  - The treatment group ( $n = 27$ ) participated in learner centered active-learning based trainings.
  - The control group ( $n = 34$ ) participated in trainer centered traditional lecture based trainings.
  - Training topics included cross contamination, food security, hygiene, hand washing, and injury and illness.
- The subjects were asked to complete a demographic survey, a multiple choice food safety knowledge pre-test, a post-test, and a training reaction survey. Each group was also observed working in the facility four separate times.

## Results

Demographic survey:

- Most frequently chosen age group was 35-44 years old.
- Majority of both the treatment and control groups (86% and 92% respectively) reported completing high school or less.
- Subjects ranged from ten or more years of work in the vegetable industry to less than one year of experience.
- 100% of participants reported Spanish or Spanish and English as their preferred language.

| Test Section                        | Control Group Pre-test to Post-test |           |               |       |          | Treatment Group Pre-test to Post-test |           |               |         |          |
|-------------------------------------|-------------------------------------|-----------|---------------|-------|----------|---------------------------------------|-----------|---------------|---------|----------|
|                                     | M                                   |           | One-way ANOVA |       |          | M                                     |           | One-way ANOVA |         |          |
|                                     | Pre-test                            | Post-test | F(1,66)       | p     | $\eta^2$ | Pre-test                              | Post-test | F(1,52)       | p       | $\eta^2$ |
| <b>Cross Contamination</b>          | 2.41                                | 2.50      | 0.33          | .570  | .005     | 2.07                                  | 2.70      | 12.96         | <.001** | .199     |
| <b>Food Security</b>                | 2.74                                | 2.88      | 2.00          | .162  | .029     | 2.67                                  | 2.96      | 3.63          | .062    | .065     |
| <b>Hygiene, Clothing, Equipment</b> | 1.71                                | 1.97      | 3.02          | .087  | .044     | 1.81                                  | 2.22      | 6.96          | .011    | .118     |
| <b>Hand Washing</b>                 | 2.24                                | 2.65      | 7.97          | .006* | .108     | 2.11                                  | 2.93      | 17.58         | <.001** | .253     |
| <b>Illness and Injury</b>           | 2.59                                | 2.44      | 0.99          | .324  | .015     | 2.59                                  | 2.70      | 0.61          | .437    | .012     |
| <b>Total Test Score</b>             | 11.68                               | 12.44     | 3.32          | .073  | .048     | 11.26                                 | 13.52     | 21.09         | <.001** | .289     |

Training Reaction Survey:

- The treatment group chose agree or strongly agree more often than the control group on seven of the ten statements.
- The statement in which the active learning group chose strongly agree most often (93% of treatment group) was, “I plan on using the content of the training at my job.” Only 79% of the control group chose strongly agree on this statement.

## Conclusions/Recommendations

- Both active and traditional training methods were received positively by the subjects and pre-assessment was critical to understanding the audience and training development.
- Food safety training programs that incorporate active learning techniques can result in higher test scores than traditionally trained subjects.
- It’s recommend that vegetable food safety teams incorporate active learning strategies into their training programs.
- Food safety trainers should utilize pre-assessments to determine the knowledge levels and skills of their trainees and to better target individuals with active learning strategies.
- Food safety teams should continue to enhance and improve training programs to provide better trainings to employees with the goal of lowering risk of contaminated food causing food borne illnesses and outbreaks.